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Climate Damage 'Irreversible' According Leaked Climate Report

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- **Interesting slam of Judith Curry (Score:-1, Flamebait)**

  by mdsolar (1045926) Alter Relationship
  The report is getting slammed by sloppy thinkers. Judith Curry's conceptual difficulties are detailed here: http://www.realclimate.org/ind...

  - **Re: (Score:0)**

    by drfred79 (2936643) Alter Relationship
    MDSOLAR why do you post links from that biased site every time climate comes up? Do you work for them? Post from respectable sources.

    -
    -

Re: (**Score:3**)

by i kan reed (749298) Alter Relationship

Please characterize the bias.

I won't reject your claims of bias out of hand(and benefit of the doubt is pretty much entirely what deniers rely on for everything so my patience is a little limited.

This isn't "Watts up with that" where there's a financial payment for having the right opinions. These are scientists with appropriate credentials discussing common misinformation.

If there **is** a bias, there must A: be an undisclosed or clearly concerning motivation or B: some kind of oversight problems.

I don't mind

-
-

›

Re:Interesting slam of Judith Curry (**Score:3**)

by Layzej (1976930) Fan on 2014-08-27 8:42 (#47765607)
The site has a science bias. It publishes articles written by scientists. Obviously this doesn't play well for those interested in the various narratives spun by Watts Up with That.
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Re:Interesting slam of Judith Curry (**Score:2**)

by Lumpy (12016) Alter Relationship on 2014-08-27 9:05 (#47765893) Homepage

I want to know what the Witch Doctors of New Orleans think about it. We all know that that is the real authority on what is happening in the world.

--
Do not look at laser with remaining good eye.
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Re:Interesting slam of Judith Curry (**Score:3**)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 9:24 (#47766089)

The site has a science bias. It publishes articles written by scientists. Obviously this doesn't play well for those interested in the various narratives spun by Watts Up with That.

You mean science like the Cook "97%" survey they supported and cited, which was such a laughable parody of responsible statistics that a middle-schooler could show it to be invalid?

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Re:Interesting slam of Judith Curry (**Score:2**)

by Layzej (1976930) Fan on 2014-08-27 9:42 (#47766269)
I'm not too interested in you conspiracy theories (for instance your wacky theories on Obama's birth cirtificate: http://slashdot.org/comments.p...).

The 97% consensus paper has been replicated numerous times. The scientists own evaluation of the reviewed

papers found an even stronger result. Just last month another replication was published: http://pubs.acs.org/doi/abs/10...

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Re:Interesting slam of Judith Curry (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 10:11 (#47766635)

I'm not too interested in you conspiracy theories (for instance your wacky theories on Obama's birth cirtificate: http://slashdot.org/comments.p...).

Ad-hominem at its best. Of course that's what I have learned to expect from "Laysej", otherwise known as "khayman80". Someone who seems actually proud to be running sock-puppet accounts on Slashdot. So... what does "conspiracy theory" have to do with one person's bad paper? Are YOU suggesting that there is some kind of "conspiracy" going on? I didn't. In fact I have several times described here on Slashdot how a situation can look like "conspiracy" to some people without there actually being any conspiracy. So the only person suggesting ANYTHING about "conspiracy" here is you.

The 97% consensus paper has been replicated numerous times.

Hah! Has it really? By whom? Are you referring to Naomi Oreskes, who was also blatantly guilty of selection bias?

This "97%" figure came from a **selected** subset of the respondents, who were only 29% of those surveyed. And the subjective selection process was not even remotely valid or even scientific. Objective interpretation of the same data came up with a figure more like 0.5%.

Cook's paper is an even bigger joke than Oreskes' paper was. And so is the work of Cook's friend and collaborator Lewandowski.

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Re:Interesting slam of Judith Curry (Score:1)

by BasilBrush (643681) Friend of a Friend on 2014-08-27 10:15 (#47766683)

Shut the fuck up you imbecile. If you can't even accept a birth certificate your head is so far up your own rectum no one can hear you.

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Re:Interesting slam of Judith Curry (Score:1)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 11:52 (#47767747)

Shut the fuck up you imbecile. If you can't even accept a birth certificate your head is so far up your own rectum no one can hear you.

Yes, we've observed you playing the "La la la la, can't hear you" game for quite some time now.

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Re:Interesting slam of Judith Curry (Score:3)

by Layzej (1976930) Fan on 2014-08-27 10:27 (#47766813)

"Laysej", otherwise known as "khayman80"

Another conspiracy theory?

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Re:Interesting slam of Judith Curry (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 11:34 (#47767499)

Another conspiracy theory?

No, but I find it very interesting that both of you have the same mannerisms, you're the only two who have written certain things to me, or used certain phrases, and usually about the same subjects. Not to mention the often "fortuitous" timing of your comments.

If you're not a sock-puppet, then you're a clone. And that's very far from a compliment.

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Re:Interesting slam of Judith Curry (Score:3)

by Layzej (1976930) Fan on 2014-08-27 11:42 (#47767591)

I find it very interesting that both of you have the same mannerisms...

You don't just "find it very interesting". You have jumped to the conclusion that several people who disagree with you must all be the same person. That's just nutty.

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Re:Interesting slam of Judith Curry (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 12:03 (#47767897)

You don't just "find it very interesting". You have jumped to the conclusion that several people who disagree with you must all be the same person. That's just nutty.

Really? Can you point out where I have said this to other people? Hint: no, you can't, because I haven't. You're the only one doing this.

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Re:Interesting slam of Judith Curry (Score:3)

by Layzej (1976930) Fan on 2014-08-27 12:44 (#47768417)
Sure. You accused an AC of being a sock puppet of me because she agreed with me... or are you not considering her "other people" because you've already concluded that she's me?

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Re:Interesting slam of Judith Curry (Score:3)

by Layzej (1976930) Fan on 2014-08-27 12:57 (#47768601)
In that case you've really got this locked up quite tight. Any evidence contradicting your theory can be dismissed as part of the ruse itself.
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Re:Interesting slam of Judith Curry (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 17:03 (#47770747)
There wasn't any "evidence". It was an AC who jumped into the conversation, in EXACTLY the same way you and khayman80 do. Using some of the very same phraseology, and the timing was (yet again) very weirdly coincidental. Further, khayman80 is known to have used sock-puppet accounts, and even admitted it to me once. (He doesn't seem to realize that, but there is a record of it.)

So no, bringing up an AC sock-puppet is not really evidence of anything, since it is known that khayman80 has used them.
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Jane Q. Public is Lonny Eachus (Score:2)

by khayman80 (824400) on 2014-08-27 17:15 (#47770801) Homepage Journal
Is this the record you claim I "don't seem to realize" or can you link to an earlier squirrel?
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Re:Interesting slam of Judith Curry (Score:3)

by Layzej (1976930) Fan on 2014-08-27 17:51 (#47771001)
Right. So you've never accused anyone else of being a sock puppet because everyone else you've accused is a sock puppet. I concede. Your logic cannot be refuted.
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Re:Interesting slam of Judith Curry (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 20:49 (#47771829)
That isn't what I said, so it isn't my logic in question here.
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Re:Jane Q. Public is Lonny Eachus (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 20:57 (#47771859)
Although I have kept records of some of your comments, why do you expect I would have them handy? Not everybody shares your particular brand of obsession.

I don't keep links to all your past comments at hand, or generally bother to search for them, for 2 reasons: (1) I just don't care much about you or past shit you've written, with one exception but I don't particular want to discuss that. And (2) unlike you, I'm just not that kind of weirdo. I have better uses for the records I keep.
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Jane Q. Public is Lonny Eachus (Score:2)

by khayman80 (824400) on 2014-08-27 21:03 (#47771873) Homepage Journal
So you're unable/unwilling to produce these records that you claimed I "don't seem to realize"? Irony?
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Re:Jane Q. Public is Lonny Eachus (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 21:11 (#47771897)
In fact, the more I read of these old streams, the more I've found where I was actually correct. (Like the one on bicycle stability for instance.) I have a copy of that paper right here and it says I was correct.

Etc. Funny how when I say I'm done putting up with your bullshit, you try to ad-hominem me into replying more. You're weird, guy.

But I really am done putting up with your bullshit. Your attempts to shame me haven't been coming off too well, you know.
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Re:Jane Q. Public is Lonny Eachus (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 21:18 (#47771925)
Unwilling.

I have no obligation to prove every statement I make to you on Slashdot. In fact I have very good personal reasons for not wanting to tell you: I don't want to give you an opportunity to try to bullshit your way out of yet another aspect of your antisocial behavior. No fear: the records are safe.
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Re:Interesting slam of Judith Curry (Score:3)

by riverat1 (1048260) Friend on 2014-08-28 0:18 (#47772383)

LOL. There are some local climate contrarians (to put it nicely) here in Oregon who are convinced I'm a sock puppet for David Appell. I find it amusing and an indication of how easily they latch on to erroneous ideas.

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Re:Interesting slam of Judith Curry (Score:3)

by Layzej (1976930) Fan on 2014-08-28 3:04 (#47772755)
I suppose, if we have to be sock puppets, we could do worse. :P
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Re:Interesting slam of Judith Curry (Score:1)

by BasilBrush (643681) Friend of a Friend on 2014-08-27 10:13 (#47766657)

You're a birther? Fuck me, you're an imbecile. I've lost what little respect I had for your opinions. You have to be insane or a deliberate liar to be a birther.

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Re:Interesting slam of Judith Curry (Score:0)

by Anonymous Coward on 2014-08-27 10:52 (#47767061)

The press release for Mr. Obama's books even stated that he was born in Kenya. You would think an astute scholar would have noticed a discrepancy about his birthplace and have it corrected. He knew he could play it for all it was worth, and suckers would believe any controversy was his opponents' fault. But then, I expect no less from you than complete lack of thinking skills on any subject related to your religion.

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Re:Interesting slam of Judith Curry (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 11:32 (#47767475)
No, I am not a "birther", as I have explained many times here on Slashdot, in some detail.

Do you always believe what other people say, as long as it fits your pre-conceived notions?
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Jane/Lonny Eachus "isn't" a birther (Score:2)

by khayman80 (824400) on 2014-08-27 11:47 (#47767677) Homepage Journal

> ... he's never sorted out that mess about his birth certificate, either. I know that lots of amateurs claimed "fake"... but lots of well-respected professionals have claimed "fake" since then, and no answers have been forthcoming. And probably never will. [Jane Q. Public, 2012-11-08]

Genuine, well-renowned graphics experts have examined Obama's supposed birth

certificate, and it's definitely a fake. It's not even a very good fake. [Jane Q. Public, 2012-11-08]

Obama isn't even eligible to be President. His birth certificate (I'm not talking about the first flap and all the amateurs) is fake. Verified later by actual graphics experts. And not even a very good fake. [Lonny Eachus, 2012-11-07]

... There is actually quite a bit of very strong evidence of fakery. Having said that: I know of no proof that Obama himself was necessarily behind any of it. [Jane Q. Public, 2012-11-09]

That isn't "conspiracy theory", it has been proved beyond doubt. Not saying HE did it. But somebody did. [Lonny Eachus, 2012-07-10]

... I also have not claimed that Obama was directly involved in the forgery. But one must ask: why would the White House post a fake? And why would they then take it down if it were NOT a fake? ... [Jane Q. Public, 2012-11-10]

Somebody is lying. I'm not claiming, myself, that it's a forgery. But it HAS been altered. Which (if it were genuine) would be STUPID. [Lonny Eachus, 2011-05-03]

... EVERY OTHER piece of documentation that Obama has produced to support his citizenship (like his selective service registration) have overt signs of "forgery" written all over them. ... [Jane Q. Public, 2013-08-15]

... the "birth certificate" released by the White House last year is a fake. And also Obama's Selective Service card. [Lonny Eachus, 2012-07-02]

One really has to ask: why is it that ALL available documentation of Obama's citizenship appears to be forged? And before you argue with me: yes, there is A LOT of real evidence, and it ALL points to forgery. Explanations offered so far don't wash. [Lonny Eachus, 2013-07-21]

Those of you who know me may remember that I downloaded a copy of the original birth certificate file myself, and personally confirmed [Lonny Eachus, 2012-07-02]

I got the cert. online myself and looked. Alteration was OBVIOUS. Why Whitehouse would offer it as proof of anything is a mystery. [Lonny Eachus, 2013-07-21]

... I am certain because I downloaded a copy of it and examined it myself, layer by layer. I did read analyses on the Internet, but I confirmed the truth of some of them myself. ... [Jane Q. Public, 2014-07-31]

... I don't claim that he's not a citizen. I have claimed that **all the evidence we have** strongly suggests that his documents are forgeries. ... [Jane Q. Public, 2013-08-15]

... I did not say Obama was born in a foreign land. ... [Jane Q. Public, 2012-11-10]

Now, look. I'm not trying to say that Obama was not born in the United States. However, the preponderance of the evidence does suggest that. [Lonny Eachus, 2012-05-18]

... I do not pretend to know where Obama was or was not born. ... I don't claim Obama is not an American. I'm just saying that the White House, for reasons of its own, has put up a faked document. ... that does not in itself prove he's not an American citizen. ... [Jane Q. Public, 2014-07-09]

The publisher's website said Obama was born in Kenya until 2 months AFTER he announced he was running for President. exm.nr/LksgJ9 [Lonny Eachus, 2012-05-18]

Obama's "Birth Certificate" lists race as African. In 1961, it would have said "Negro". The word "African" was not used to describe race. [Lonny Eachus, 2011-05-03]

I was not a "birther". But I might have been... I thought the President had already proven his birth situation. Apparently not. [Lonny Eachus, 2011-04-29]

I was not a "birther". But now I am tempted. Apparently there is pretty good evidence that Obama's new birth certificate is fake. [Lonny Eachus, 2011-05-01]

I have to admit: most of my doubts are now gone. The President's birth certificate (shown so prominently on Oprah) is a fake. [Lonny Eachus, 2011-05-01]

> "[the real question is] not the sanity of the "birthers", but why the President did not produce his birth certificate long ago." [Lonny Eachus, 2011-04-29]

No, the real question **is** the sanity of the birthers. But my favorite is Jane/Lonny Eachus's 9/11 Truther conspiracy theory.

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Re:Jane/Lonny Eachus "isn't" a birther (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 12:00 (#47767871)
As I've explained many times before: having issues with certain documents does not equal claiming that Obama was born elsewhere.

Further, it turns out that you are ignorant of reasons I've turned up (and mentioned before) why such alterations might actually have perfectly legitimate reasons behind them. No conspiracy necessary.

But no; you ignore those and only post those things, out of context, in order to make me appear to be a "birther" when I have explained to you several times that I don't claim to have any idea where Obama was born, and don't claim that those documents are evidence that he was born elsewhere. Hint: rabidly claiming that Obama was born elsewhere is what makes somebody a "birther". I don't fit that category.

You take comments out of context that seem to support your argument, but when taken IN context, together with other statements I have clearly made, the "birther" claim is shown to be false.

And you know this, because I have explained it to you repeatedly. So your tirade above is nothing more than a sneaky form of lying.

And it's really interesting how you're always there to jump in and defend "Laysej". Clone? Sock-puppet?
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Jane/Lonny Eachus "isn't" a birther (Score:2)

by khayman80 (824400) on 2014-08-27 12:22 (#47768139) Homepage Journal

> Hint: rabidly claiming that Obama was born elsewhere is what makes somebody a "birther". [Jane Q. Public, 2014-08-27]

In True Scotsman style, you can't be a "birther" unless you have rabies. Except you've previously implied that what makes someone a "birther" is claiming Obama's birth certificate is fake:

> I was not a "birther". But I might have been... I thought the President had already proven his birth situation. Apparently not. [Lonny Eachus, 2011-04-29]
>
> I was not a "birther". But now I am tempted. Apparently there is pretty good evidence that Obama's new birth certificate is fake. [Lonny Eachus, 2011-05-01]
>
> I have to admit: most of my doubts are now gone. The President's birth certificate (shown so prominently on Oprah) is a fake. [Lonny Eachus, 2011-05-01]
>
> Now, look. I'm not trying to say that Obama was not born in the United States. However, the preponderance of the evidence does suggest that. [Lonny Eachus, 2012-05-18]

> The publisher's website said Obama was born in Kenya until 2 months AFTER he announced he was running for President. exm.nr/LksgJ9 [Lonny Eachus, 2012-05-18]

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Jane/Lonny Eachus "isn't" a 9/11 Truther (Score:2)

by khayman80 (824400) on 2014-08-27 16:19 (#47770435) Homepage Journal

> That still doesn't explain why the owner of the building himself said that they blew it up. Or why the BBC reported its fall 20 minutes before it actually fell. ... blah blah ***[Jane Q. Public, 2008-08-24]***
>
> ... Kinda hard to argue with the owner of the building when he publicly says he did it on purpose! ... why did the OWNER say that it was done on purpose? ... A NY radio station was **told beforehand** that the building was going to be demolished. The BBC reported the fall of the building 20 minutes before it actually fell. ... the odds are strongly against the idea that WTC 7 collapsed due to fire. ... Does this prove that WTC 7 did not collapse because of the fire? No, of course not. But the credibility of any "official" story by now is very, very thin. ***[Jane Q. Public, 2008-08-24]***
>
> ... for example lumping 9/11 together with the moon landing. Those are not even remotely the same class of questions. ... On 9/11, for example, there are some very serious questions, raised by very reputable scientists. Not "conspiracy theorists". ***[Lonny Eachus, 2012-02-10]***
>
> Your "examples" should not all be grouped together, since some of them are at vastly different levels of "known", compared to the others. For example, some (but by no means all) of the "9/11 truthers" (a very derogatory phrase) have some good evidence to cite. This is hardly something an area that is "unequivocally known". ... Further, while flouride may not be a communist plot, there are some very serious ethical issues involved with putting it in drinking water. ***[Jane Q. Public, 2010-02-24]***
>
> ... it goes on to say that fluoridated products should NEVER be ingested by children, because of possible adverse effects. Then it goes on further to say that THERE IS EVIDENCE of other harmful effects from fluoride, PARTICULARLY the form that is commonly put in drinking water. Now, I want to emphasize something: I am not a “conspiracy theorist”, and I do not believe there is some giant conspiracy to stupidify America via the drinking water. But this is what I very much **DO** believe: When there are serious, scientifically valid questions about adverse physical effects of a substance (as their are with fluoride), you’re a moron if you want to put it in the drinking water. ***[Lonny Eachus, 2013-10-19]***
>
> ... One thing working in the conspiracy theorists' favor is the fact (discovered by reputable scientists with expertise in the subject and no conflict of interest, and independently verified) that the dust from the buildings contained bits of high-tech thermite. Not your everyday garage variety, either, but real high-tech stuff that is usually only available to government and military. ... there is **documented**, solid and confirmed evidence, by university scientists, that not only was there thermite, it was of a particular, restricted commercial variety. ... The 9/11 Commission report is nothing but a joke. The later NIST report ignores many important factors. ... burning jet fuel cannot "melt" structural steel. It's not even remotely hot enough. It's not even hot enough to seriously weaken it. But don't take my word for it. Regarding the thermite: see my reply and the link I provided a few comments up. Unless you are qualified to refute reputable experts in the field, then the fact remains that it is well-established that not only thermite, but a particular BRAND of thermite, was present in quantity. ... jet fuel does not burn anywhere near that hot. If you can melt a section of 12" steel I-beam with any quantity of

> jet fuel you want to use -- type A or B, I don't care -- I will personally lobby to get you the Nobel Prize. ... blah blah blah ***[Jane Q. Public, 2012-06-15]***
>
> ... there are truckloads of good evidence re: 9/11, yet most people just shrugged it off. ... Like university researchers (not crackpot nobodies) finding specialized, high-tech thermite in dust from 3 different locations. ***[Lonny Eachus, 2013-04-23]***
>
> This is very interesting. There is A LOT of evidence contradicting government accounts of 9/11. consensus911.org/the-911-consen... ***[Lonny Eachus, 2013-08-11]***

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Re:Jane/Lonny Eachus "isn't" a 9/11 Truther (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 17:00 (#47770721)
And your point is?

Do you have a particular argument to refute? If so, why didn't you refute it long ago?

Oh, that's right. You aren't very good at refutation. I forgot.
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Jane/Lonny Eachus "isn't" a 9/11 Truther (Score:2)

by khayman80 (824400) on 2014-08-27 17:07 (#47770761) Homepage Journal

My point is that you've been spreading nonsense like a firehose for years, and each time your Sauron-class Morton's demon convinces you that you're right and the other person isn't very good at refutation. This doesn't just apply to your nonsense about climate change, dark matter, neutrino oscillation, the Casimir effect and Maxwell's equations, creationists, Obama birthers and 9/11 Truthers.

It also applies to your nonsense about conservation of energy, beta decay, quantum computing, nuclear isomers, Cherenkov radiation, virtual particles, infinities, string theory, cold fusion, R o s s i ' s E - C a t L E N R h o a x, peltier coolers, GPS, bicycle stability, control theory, hyperbolic trajectories, relativistic slingshots, replicators, the Kessel run, x-rays, gene therapy, Dr. Bur z y n s k i, ferret superflu, fluo ride, ethanol, petaflops, correlation/causation, failure probabilities, slavery, h o m o p h o b i a, the transgendered, punctuation, space flight, thrust, specific impulse, fly-by-wire, the FAA, airspace, inflation and the gold standard, capitalism, bitcoins, atom bombs, AK-74's, NATO rounds, firearm laws, state laws, Shock and Awe, naval bases, paranoia, Layzej's link, etc.

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Re:Jane/Lonny Eachus "isn't" a 9/11 Truther (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-27 20:47 (#47771823)
See, there you go again. Out of context links to things said long ago, in some kind of half-assed attempt to prove something.

Just a brief sample: GPS. Turned out that the people who were arguing with me were wrong, but I was wrong too. Although I assert that I was closer than they were. My

statement that three satellites were sufficient to triangulate a point space (given arbitrarily fine precision) was correct. Others were arguing that it requires 4. It turns out GPS uses a minimum of 4, but the 4th is a **ground station** (not satellite) used to correct for errors, not necessary for the basic triangulation.

So that wasn't nonsense. In fact not only was I essentially correct about the geometry, I was the one who found the actual answer to that one and told everyone else.

Let's see... Rossi. At no time did I say the Rossi affair was not a hoax. I mentioned that he had sold one or two of his devices (and he had sold at least one). What of it? The U.S. navy has been looking into similar LENR reactions for decades, as have other scientists. That's a fact. Go ahead, try to refute it. In fact what I said about Rossi was wait and see.

YOUR problem is that you claim these things are nonsense, but you haven't disproved a single one of them. Why not?

It's ad-hominem. Plain and simple. By presenting these things (which YOU can nonsense, out of context), you are merely making yet another attempt at character assassination. I am not impressed.

Oh... and I was only partly wrong about the NATO rounds. The originals were exactly as I described them. It turned out that the UN declared the standard rounds **too deadly**, so they were changed to be heavier with a steel insert. I wasn't wrong, my information was just old. I hadn't known about the change, which occurred around 1980 or so.

So sure, I've made some small errors. And admitted them when I did. But that is only a minority of links above, which you are apparently trying to claim are all "nonsense". Like the beta decay: after some initial confusion I asked how the oscillations take place, and someone answered. I admitted that I was wrong.

You don't see the comments where I admitted I was wrong in your links above, do you? Why is that? No need to answer: the obvious answer is again that this is not an attempt at presenting factual information, it's simply an attempt to make me look bad, using underhanded (and illegitimate) tactics. Not to mention that in a lot of it I wasn't wrong at all, you just think I was.

But like I said before: this kind of shit is exactly what I have learned to expect from you.

One last thing, to anybody else who has bothered to wade through all his bullshit: ask yourselves why he's keeping a record of ALL the comments I made on Slashdot over a period of years that he thinks were wrong. Do YOU do that to people? No, you don't, do you? That's because YOU are probably a normal human being, who doesn't stalk or obsess over strangers.

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Jane/Lonny Eachus "isn't" a 9/11 Truther (Score:2)

by khayman80 (824400) on 2014-08-27 23:20 (#47772229) Homepage Journal

> ... I was only partly wrong about the NATO rounds. ... I wasn't wrong, my information was just old. ... ***[Jane Q. Public, 2014-08-27]***

Condescendingly lecturing a veteran like this was wrong: *"Bullshit, dude. Maybe where your tour was... Just plain bullshit. ... Give up, man. You are trying to argue with someone who knows what she's **[she's?!?]** talking about. ... Jeez, dude. Do you even read your own bullshit? ... You may know more than I do about what the military is currently doing, but I do know something about 5.56 ballistics, thank you very fucking much. ... maybe you know more about what the military is doing these days, but if that's what they're doing, they're being just plain stupid. ..."*

> ... So sure, I've made some small errors. And admitted them when I did. But that is only a minority of links above, which you are apparently trying

> to claim are all "nonsense". Like the beta decay: after some initial confusion I asked how the oscillations take place, and someone answered. I admitted that I was wrong. ... ***[Jane Q. Public, 2014-08-27]***

No, after delt0r answered, you insisted he must not have understood your point. After I repeated delt0r's point, you claimed that you had got yourself sorted out already and accused me of butting in and insulting you.

You've repeated this pattern ad nauseum. After your neutrino rant, you repeatedly claimed that I missed where you admitted you were wrong and asked me "why didn't you **bother** to repeat the part...?" when I actually **had** repeated that part and responded to it.

> In fact, the more I read of these old streams, the more I've found where I was actually correct. (Like the one on bicycle stability for instance.) I have a copy of that paper right here and it says I was correct. ... ***[Jane Q. Public, 2014-08-27]***

It's more likely that your Sauron-class Morton's demon told you that it says you were correct. Just like you've insisted you were still correct about punctuation despite never providing sentences with the plurals of i, a, and u.

> ... YOUR problem is that you claim these things are nonsense, but you haven't disproved a single one of them. Why not? ... in a lot of it I wasn't wrong at all, you just think I was. ... ***[Jane Q. Public, 2014-08-27]***

Because you're galloping faster than any Gish Gallop I've ever seen, and because despite your protests you seldom accept refutations for longer than about 5 minutes anyway.

> ... One last thing, to anybody else who has bothered to wade through all his bullshit: ask yourselves why he's keeping a record of ALL the comments I made on Slashdot over a period of years that he thinks were wrong. Do YOU do that to people? No, you don't, do you? That's because YOU are probably a normal human being, who doesn't stalk or obsess over strangers. ***[Jane Q. Public, 2014-08-27]***

I probably don't have more than about a month to live, so I'm obsessing over my legacy. The misinformation you're spreading seems like the biggest current threat to humanity, so I'll spend my final days debunking you.

> ... Your attempts to shame me haven't been coming off too well, you know. ***[Jane Q. Public, 2014-08-27]***

One disturbing possibility is that you can't experience shame, which is why I'm trying to figure out why you're shamelessly posing as a woman. Maybe the way you were raised could help answer this question.

> ... I was seriously concerned that my dad might start thinking I was gay or something. :0) ***[Lonny Eachus, 2009-11-01]***
>
> I was sure by then my father must have been convinced I was gay or something. ***[Lonny Eachus, 2011-03-07]***
>
> ... seriously thinking: "Oh, shit. My father probably thinks I'm gay or something now." ***[Lonny Eachus, 2011-12-23]***
>
> Well, you would have to know too that my father was a pretty serious bigot and gay-basher, both. It's how HE was raised. ***[Lonny Eachus, 2011-12-23]***

I meant what I said to Demena. I dismissed the possibility that you're transgendered after you claimed that was quite literally not your problem. But if your gay-bashing bigot father left you confused about your gender then I'll apologize, retract my accusations, and support you as you experiment with your gender identity.

Releasing this burden might even let you stop spreading civilization-paralyzing misinformation. Jane/Lonny Eachus would have fewer stains on his legacy, and civilization would be less paralyzed. Win-win.

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Re:Jane/Lonny Eachus "isn't" a 9/11 Truther (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-28 11:48 (#47777381)

Condescendingly lecturing a veteran like this was wrong:

I made a mistake **and admitted it**. Are you trying to claim that you don't make mistakes? You won't even dare to have your analysis of Spencer's thought experiment be seen by someone who actually has a degree in chemistry or physics, and some familiarity with the issue.

No, after delt0r answered, you insisted he must not have understood your point. After I repeated delt0r's point, you claimed that you had got yourself sorted out already and accused me of butting in and insulting you.

Re-hashing old shit which has been explained to you before. I made a mistake and admitted it. Yes, I argued at first, but I found out I was wrong and explicitly said so. YOU don't think my admission was good enough for your taste. Too damned bad. I still admitted it.

Because you're galloping faster than any Gish Gallop I've ever seen, and because despite your protests you seldom accept refutations for longer than about 5 minutes anyway.

Nope. You are conflating 2 different arguments here, which has been one of the hallmarks of your own arguments. Not my problem.

I probably don't have more than about a month to live, so I'm obsessing over my legacy. The misinformation you're spreading seems like the biggest current threat to humanity, so I'll spend my final days debunking you.

Hahaha. First, I don't believe you, and second, you'd have to do a lot better than this. And if I were you I'd pick something more worthy to spend my final time on, than personally attacking someone who has done nothing to you but be a victim of your vicious character attacks for years. I have already brought this to the attention of an attorney, who referred me to another because it's not his specialty. Further action is pending.

One disturbing possibility is that you can't experience shame, which is why I'm trying to figure out why you're shamelessly posing as a woman. Maybe the way you were raised could help answer this question.

I experience shame just fine, when I have something genuine to be ashamed about. You haven't shown me any. Do you honestly expect me to feel shame over arguments with YOU? Jesus, you have an amazing ego. Narcissus would be proud.

And digging up 3 mentions of the same story on Twitter, some from 5 years ago, and some 2 years apart? Man, that must have taken some digging. Yes, I did check them out, which took quite a while by the way, so I know. You obviously have a serious (and possibly dangerous) obsession to be poring over someone else's records this way. I repeat: if you really believe we are the same people, then why doesn't the word "stalking" occur to you? Internet stalking is a crime in California. And you can bet that, as I have said before, I am keeping records. You may not like me but at least I am not a social **criminal** like some people I could name.

But I am curious: why have you collected those 3 mentions of one story, which was obviously intended to be humorous? Of course you left the humor part out, didn't link to that, which was just as obviously intentional on your part, and again one of your consistent habits: taking things out of context, and pasting them together to give a false impression.

I also wonder why you have a habit of linking to archives, or indirect links to other links, rather than the originals. I suspect that it is to prevent others from following the information stream, and seeing what the conversation was really about.

I meant what I said to Demena. I dismissed the possibility that you're transgendered after you claimed that was quite literally not your problem. But if your gay-bashing bigot father left you confused about your gender then I'll apologize, retract my accusations, and support you as you experiment with your gender identity.

I'm not in the slightest confused. Or ambiguous, for that matter. I think your feigned concern for a "problem" that is purely in your own mind is rather disgusting behavior, and is again intended to do nothing but further smear my character by implication.

Releasing this burden might even let you stop spreading civilization-paralyzing misinformation. Jane/Lonny Eachus would have fewer stains on his legacy, and civilization would be less paralyzed. Win-win.

Except of course that you still have yet to share with us what this "civilization-paralyzing misinformation" is. It isn't in the links you provided above. And you're still wrong about Spencer and Latour.

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- **Re:Jane/Lonny Eachus "isn't" a 9/11 Truther (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-28 12:11 (#47777635)
And if you really are dying, I will leave you with this parting gift:

Despite your obsession, and the extent of your research, I still know things you don't. Why do you think I've felt free to be so glib? I've been watching you make a fool of yourself, ever since you revealed what a despicable human being you are (again, just my opinion of course, but I've had some confirmation).

My advice to go do something more worthwhile was sincere. Because if you don't, after you are gone, I will quite happily reveal those things and your "legacy" won't be quite what you thought it was.

That's not a threat in any way, it's just a description of the truth. I haven't been attacking YOU, it has all been coming FROM you. And this topic on Slashdot is just one more example that anybody can see. I have defended myself where I felt it to be necessary, but NOBODY else on this Earth has made it necessary. Just you. I haven't tracked you down and harassed you. You have done that to me. I haven't made a habit of jumping in to other conversations, just to try to humiliate YOU. But you have done so to me. Etc., etc ad nauseum.

So get stuffed. I am far beyond tired of your incessant BULLSHIT. If you want to contemplate something before you die, I would suggest starting with meditating on why you have been such an incorrigibly rude, insufferable human being who makes a habit out of maliciously harassing others. Was it your own upbringing?
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-08-28 12:50 (#47778035) Homepage Journal

> ... I'm not in the slightest confused. ... ***[Jane Q. Public, 2014-08-28]***

That's what I told Demena.

> ... I still know things you don't. Why do you think I've felt free to be so glib? I've been watching you make a fool of yourself, ever since you revealed what a despicable human being you are (again, just my opinion of course, but I've had some confirmation). My advice to go do something more worthwhile was sincere. Because if you don't, after you are gone, I will quite happily reveal those things and your "legacy" won't be quite

> what you thought it was. That's not a threat in any way, it's just a description of the truth. ... ***[Jane Q. Public, 2014-08-28]***

Empty bluster won't stop me from continuing to debunk your civilization-paralyzing misinformation as long as I can.

> ... you still have yet to share with us what this "civilization-paralyzing misinformation" is. It isn't in the links you provided above. And you're still wrong about Spencer and Latour. ***[Jane Q. Public, 2014-08-28]***

Yes it was. And you're **still** spreading Dr. Latour's civilization-paralyzing Slayer misinformation:

> ... The plate cannot cause the heat source to be hotter because that would require NET heat transfer in the other direction. ... ***[Jane Q. Public, 2014-08-20]***

No. Again, warming the heat source doesn't require net heat transfer from the plate to the source. At equilibrium, power in = power out. Because electrical heating power is constant, the heat source warms even if net "power out" decreases. It doesn't have to reverse direction (plate to source) in order to warm the source.

Maybe an analogy would help. Suppose water flows from a bathtub faucet at a rate of 1 liter/minute. The drain is open, letting water out at 1 liter/minute. Since water in = water out, the bathtub water level is constant.

Now partially close the drain so water only leaves at 0.5 liter/minute. Since water in > water out, the bathtub water level rises.

Raising the bathtub water level **doesn't** require that the drain reverse direction and start pumping water up from the drain into the bathtub. Because the faucet pours a constant 1 liter/minute into the tub, raising the water level only requires **reducing** the water out.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-28 13:21 (#47778395)

Yes it was. And you're still spreading Dr. Latour's civilization-paralyzing Slayer misinformation:

You are implying that my stance on AGW is because of politics? Hahahaha! That's a hoot.

And re: Latour, your argument is just asinine. Especially from someone who claims to be a physicist. First, your bathtub analogy is completely irrelevant to the situation at hand. A plate near the heat source is NOT even remotely the same as closing the drain on a bathtub, because the total power out of the system (it's a closed system with heat being **removed**, remember?) remains constant, as you have so conveniently observed. The plate has no influence whatever on the state of the whole system. You are neglecting the (physically) largest part of it, which is the outside wall.

You are neglecting other things as well. For example, you're conflating electrical power with "emissive power" or irradiance, **which are different things, in different units**. Sheesh. You'd at least expect a "physicist" to get that much right.

So I gave that much away. And you still didn't deserve it. Further, you are still denying the S-B law, though you continue to deny that you're denying it.

And there is more. I haven't given away anything that you should not have been able to easily figure out yourself. One has to wonder why you didn't.

But here's the kicker: it is abundantly obvious that the things you have done were NOT done for purposes of saving "civilization". Because if they were, you'd have

taken them to the doorstep of the people who are actually responsible for dessiminating them to the public, rather than someone in a completely different field on Slashdot. Gotcha. Your intention has merely been to smear me, by whatever cheating means you have managed to come up with. The evidence is all over Slashdot. Look in a mirror, man.

Now I have given you your bone, doggie. GO AWAY.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-08-28 14:15 (#47778969) Homepage Journal

> A plate near the heat source is NOT even remotely the same as closing the drain on a bathtub, because the total power out of the system (it's a closed system with heat being **removed**, remember?) remains constant, as you have so conveniently observed. ***[Jane Q. Public, 2014-08-28]***

Completely backwards, as usual. I've never observed any such ridiculous nonsense. That's actually Jane's ridiculous "observation" which I've already tried to correct:

*"... Hopefully it's also clear that Jane's also wrong to claim that the power used by the cooler is required to be constant. The chamber wall **temperature** is held constant, so the power used by the cooler temporarily **decreases** after the enclosing plate is added, until it reaches equilibrium."*

I've repeatedly said the electrical heating power is constant, and that adding an enclosing plate temporarily reduces power out until the heated plate warms to a higher equilibrium temperature.

> ... Since the temperature of every other object is **less than** that of the heat source, there is no net heat flow TO the heat source, therefore the heat source does not become hotter. This is, and has been, the whole of Latour's argument, and it is valid. It is not crazy speculation by some nitwit... ***[Jane Q. Public, 2014-08-02]***

Again, Eq. 1 describes equilibrium temperature:

electricity + sigma*T_c^4 = sigma*T_h^4 (Eq. 1)

Eq. 1 shows that Jane and "the whole of Latour's argument" are wrong. Net heat transfer **doesn't** have to flow from plate to source in order to cause the heat source to be hotter. Just reducing the net heat flow from source to plate is sufficient to warm the plate, as long as electrical heating power is constant.

> ... you're conflating electrical power with "emissive power" or irradiance, **which are different things, in different units**. Sheesh. You'd at least expect a "physicist" to get that much right. So I gave that much away. And you still didn't deserve it. ... Now I have given you your bone, doggie. GO AWAY. ***[Jane Q. Public, 2014-08-28]***

No. As I originally said: *"Using irradiance (power/m^2) simplifies the equation... Sage solves Eq. 1 for a constant electric input of 509 W/m^2."*

So the variable "electricity" has always been in the same units as irradiance, which made the equations simpler. The electrical power used by the heater is "electricity" times the surface area of the heated plate. I've repeatedly noted that electrical heating power is constant, which means that the variable "electricity" is also constant unless the heated plate shape-shifts to change its surface area. Just to be clear, I haven't been considering shapeshifting plates.

Again, it's fascinating that Jane keeps wrongly implying my previous calculations had units confused, but didn't point out the **actual** units confusion in the eq. 4 I posted.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-08-28 17:27 (#47780537) Homepage Journal
Typo: Just reducing the net heat flow from source to plate is sufficient to warm the **source**...

Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-28 23:22 (#47782107)
I'll answer in the morning. You haven't demonstrated what you think you have.

Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-28 23:24 (#47782109)
Correction: some time tomorrow or over the weekend. Not in the morning. I have other things to do.

Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-29 11:58 (#47786327)
I have looked this over, and looked at my references again. And you're still wrong. You're mischaracterizing the thermodynamics of this experiment rather egregiously. I don't know whether you are doing it intentionally or otherwise, but you're doing it.

I mentioned this to you several times, but you haven't picked up on it: just for one thing, you're claiming to be using flux but flux has an areal component which you are not accounting for. You say power in = power out, which may be true, but that total power is being transferred via emissive power, which is in W/m^2. Nowhere are you accounting for this. As I stated before: you are conflating power and emissive power, and you can't do that. Where are your areas? It might conserve energy but without areas you do not have the information required to calculate actual radiative temperature.

There are number of other factors you are 're not accounting for. My statement stands: your attempted analysis of Spencer's thought experiment is nothing but a clusterfuck pretending to be physics.

I told you where you can find a complete treatment of the actual thermodymics of this situation. If you'd actually read it and understood it (and were honest), you'd know that with a reasonable degree of precision it is correct.

You state on your website:

Radiation is proportional to T**4, so the magnitude of actual transfer is only related to T(h)**4 - T(c)**4 because hot objects absorb radiation from cooler objects. Thatâ(TM)s consistent with the second law because hot objects radiate more power to cold objects than vice versa.

Yes, this is true (with the exception of the word "only"), but you are neglecting so many other factors that this statement is meaningless in context. Nobody is claiming this statement is essentially wrong... in fact I've made it myself several times. But the devil is in the details. As you show quite well by going on to misapply it:

Nonsense. Start with conservation of energy just inside the chamber walls at equilibrium: power in = power out.

The plate is heated by constant electrical power flowing in. The cold walls at 0ÂF (T(c) = 255K) also radiate power in. The heated plate at 150ÂF (T(h) = 339K) radiates power out. Using irradiance (power/m**2) simplifies the equation: electricity + sigmaT(c)**4 = sigmaT(h)**4

This is a joke, right? Trying to see if I'd catch it?

Again, **among other things** you are substituting irradiance for power without factoring in any area. That's just simply bad math. And I repeat: you have also invalidly ignored other factors which may not be ignored.

Create a realistic scenario, draw yourself a diagram, and run some actual numbers on them rather than just tossing equations around without seeing how they fit together in the real world.

I repeat: get the experiment with the two separate plates (actively heated plate and passive plate) right first. Then you can move on to a fully-enclosing plate. You say it's simpler but in a way it's not; you're trying to ride a bicycle when you haven't even managed to ride your tricycle without falling off.

There are numerous sources, including physics and engineering textbooks, which contradict your analysis and conclusions. Why don't you try the engineering textbooks Latour cited, which have examples of real-world situations? After all: ultimately what we're talking about here is the real world, not a thought experiment.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-29 13:50 (#47787039)
My point in the last post, which I have made before and will repeat, is that either you're not competent to analyze this, or (probably more likely), you are attempting yet again to misdirect from the real science.

Your behavior has been classic: call someone who disagrees a nutcase (which you have done both explicitly and implicitly many times now) or "conspiracy theorist", and then when that doesn't work, and you are pushed to the wall, misdirect with half-answers that seem to be real but which are actually just straw-man arguments. You have done this so many times now it is becoming quite hilarious. But it's still a pain in the ass, and it's still antisocial behavior if not worse.

An actual, complete analysis of the situation gives actual, real answers which contradict your conclusions above. You have continued to try to weasel out of it, **but it isn't working**. The facts still remain and you're still wrong.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-08-29 13:59 (#47787087) Homepage Journal

> ... power in = power out. ... Using irradiance (power/m**2) simplifies the equation: electricity + sigmaT(c)**4 = sigmaT(h)**4

> This is a joke, right? Trying to see if I'd catch it? Again, **among other things** you are substituting irradiance for power without factoring in any area. ... ***[Jane Q. Public, 2014-08-29]***

Again, start with power in = power out through a boundary with surface area "A". Using irradiance (power/m^2) simplifies the equation because we can divide both sides by "A" to obtain irradiance in = irradiance out.

> ... I mentioned this to you several times, but you haven't picked up on it: just for one thing, you're claiming to be using flux but flux has an areal component which you are not accounting for. You say power in = power out, which may be true, but that total power is being transferred via emissive power, which is in W/m^2. Nowhere are you accounting for this. As I stated before: you are conflating power and emissive power, and you can't do that. Where are your areas? It might conserve energy but without areas you do not have the information required to calculate actual radiative temperature. ... ***[Jane Q. Public, 2014-08-29]***

Again, as long as the enclosing shell is nearly the same size as the heated plate, those areas are nearly irrelevant. And because it's a simpler problem (like a tricycle) one should master it before trying to ride a bicycle with complicated view factors. I already specified my areas. Again, neglecting area ratios predicts that the heated plate warms from 150F to 235F after it's enclosed. Accounting for area ratios similar to Earth's predicts that the heated plate warms from 150F to 233.8F.

So the tricycle isn't too inaccurate compared to the bicycle, it's much easier to learn, and it provides a sanity check on the more complicated calculation. As the area ratio approaches "1.0" the bicycle should give the same answer as the simpler tricycle. And it does.

Incidentally, that tricycle is much more accurate than Jane's prediction that the heated plate remains at 150F even after it's enclosed.

> ... I repeat: get the experiment with the two separate plates (actively heated plate and passive plate) right first. Then you can move on to a fully-enclosing plate. You say it's simpler but in a way it's not; you're trying to ride a bicycle when you haven't even managed to ride your tricycle without falling off. ... ***[Jane Q. Public, 2014-08-29]***

No. A spherical heated plate with a fully-enclosing shell has spherical symmetry, so the heated and enclosing plate temperatures are constant across their surfaces. That's why the equilibrium temperature solutions are just simple numbers.

However, if the passive plate doesn't fully enclose the heated plate then the heated and enclosing plate temperatures would be complicated functions of spherical coordinates theta and phi. That's a unicycle, not a tricycle.

> ... There are numerous sources, including physics and engineering textbooks, which contradict your analysis and conclusions. Why don't you try the engineering textbooks Latour cited, which have examples of real-world situations? After all: ultimately what we're talking about here is the real world, not a thought experiment. ***[Jane Q. Public, 2014-08-29]***

I already showed you that MIT's equation reduces to my Eq. 1 for blackbodies, and is consistent with these equations and Eq. 1 in Goodman 1957. I've stressed that this thought experiment has been tested for decades in the real world. Radiation shields allow for more accurate measurements of gas temperatures using thermocouples:

"The greatest problem with measuring gas temperatures is combatting radiation loss. ... surround the probe with a radiation shield ... The thermocouple bead radiates to the shield which is much hotter than the surrounding walls. Thus the radiative loss and hence temperature error is significantly reduced. The shield itself radiates to the walls."

These radiation shields have been used since at least Daniels 1968 (PDF), and they work like Dr. Spencer's insulating plate. They slow radiative heat loss from the hotter thermocouple without violating the first law, the second law, or the Stefan-Boltzmann law. Just like the greenhouse effect.

> ... Create a realistic scenario, draw yourself a diagram, and run some actual numbers on them rather than just tossing equations around without

> seeing how they fit together in the real world. ... ***[Jane Q. Public, 2014-08-29]***

How ironic. I've explained how to derive equations for increasingly realistic scenarios, ran "actual numbers" and repeatedly told you that you'd only be able to understand this thought experiment if you did the same. But you **still** haven't. Haven't you noticed that I'm the only one here deriving equations and doing calculations, while you're too busy saying things like this?

*"... non-person... disingenuous and intended to mislead ... he is either lying ... dishonest ... intellectually dishonest ... intellectually dishonest ... Khayman80's intellectual dishonesty ... Pathetic. ... you've come out the loser in every case... you can't win a fucking argument. You don't know how. You don't understand logic. You've proved this many times. Get stuffed, and go away. The ONLY thing you are to me is an annoyance. I have NO respect for you either as a scientist or a person. ... cowardice ... odious person ... you look like a fool ... utterly and disgustingly transparent ... Now get lost. Your totally unjustified arrogance is irritating as hell. ... You are simply proving you don't know what you're talking about. ... Jesus, get a clue. This is just more bullshit. ... spewing bullshit ... You're making yourself look like a fool. ... Hahahahahaha!!! Jesus, you're a fool. ... a free lesson in humility... you either misunderstand, or you're lying. After 2 years of this shit, I strongly suspect it is the latter. ... Now I **KNOW** you're just spouting bullshit. ... if we assume you're being honest (which I do not in fact assume) ... I wouldn't mind a bit if the whole world saw your foolishness as clearly as I do. ... stream of BS... idiot ... Your assumptions are pure shit. ... I'm done babysitting you..."* **[Jane Q. Public]**

"Jesus, you're a dumbshit. ... your adolescent, antisocial behavior ... keep making a fool of yourself. ... you're being such a dumbass ... your analysis of it is a total clusterfuck. ... you're so damned arrogant you think I'm the one being stupid. ... you were too goddamned stupid ..." **[Jane Q. Public]**

"... what a despicable human being you are ... an incorrigibly rude, insufferable human being ... Now I have given you your bone, doggie. GO AWAY. ... a clusterfuck pretending to be physics ... " **[Jane Q. Public]**

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- **Jane/Lonny Eachus goes Sky Dragon Slayer** (Score:2)

by khayman80 (824400) on 2014-08-29 14:52 (#47787341) Homepage Journal
Correction: However, if the passive plate doesn't fully enclose the heated plate then the heated and **passive** plate temperatures...
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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer** (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-30 4:11 (#47790231)
Spencer's INITIAL description of his thought experiment. As I have told you several time. This first, then more if you want to get into it. I will not discuss this with you in the other order, AS I HAVE TOLD YOU. Because until you get that right, you're not going to get the other one right. If you continue to argue the other case first, then we are done, and I will write you off as hopeless.

Again, as long as the enclosing shell is nearly the same size as the heated plate, those areas are nearly irrelevant. And because it's a simpler problem (like a tricycle) one should master it before trying to ride a bicycle with complicated view factors. I already specified my areas. Again, neglecting area ratios predicts that the heated plate warms from 150F to 235F after it's enclosed. Accounting for area ratios similar to Earth's predicts that the heated plate warms from 150F to 233.8F.

No "enclosing shell". Two parallel plates. The original thought experiment is two

parallel plates (we can make them of equal volume and dimensions just to simplify, but it's not necessary). I repeat: we briefly discussed "even if it were enclosing" but that's a complication of the original, and we'll solve the original first.

What the fuck am I doing? I actually started to solve this for you, after telling you I wouldn't. It must be very late on a Friday night.

Also, I don't think we're assuming black bodies. The best we can realistically do is grey bodies that absorb in all the relevant frequencies under discussion.

What the hell. Anything is better than your "thermal superconductors" that you then claim are different temperatures on different sides. Do you remember that is the second time you tried to pull that? I bet not.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-30 4:25 (#47790259)
Pardon me.

s/equal volume and dimensions/equal dimensions
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-08-30 4:42 (#47790321) Homepage Journal

> Spencer's INITIAL description of his thought experiment. As I have told you several time. This first, then more if you want to get into it. I will not discuss this with you in the other order, AS I HAVE TOLD YOU. Because until you get that right, you're not going to get the other one right. If you continue to argue the other case first, then we are done, and I will write you off as hopeless. ... No "enclosing shell". Two parallel plates. The original thought experiment is two parallel plates (we can make them of equal dimensions just to simplify, but it's not necessary). I repeat: we briefly discussed "even if it were enclosing" but that's a complication of the original, and we'll solve the original first. ***[Jane Q. Public, 2014-08-30]***

Once again, solving a problem without spherical symmetry means you'll have to solve for equilibrium temperatures which aren't constant across the heated and passive plates. Those equilibrium temperatures wouldn't be simple numbers. They'd be complicated functions that would vary across the plate surfaces. Contrast that with a spherically symmetric enclosing plate, where equilibrium temperatures are just simple numbers.

Are you disputing those facts, or do you really not see which of these problems is more complicated?

> ... Also, I don't think we're assuming black bodies. The best we can realistically do is grey bodies that absorb in all the relevant frequencies under discussion. ... ***[Jane Q. Public, 2014-08-30]***

I already solved the problem for graybodies, and showed that the graybody equation reduces to the blackbody equation. That's why it's useful to solve the simpler blackbody problem first, to provide a sanity check on the more complicated solution.

> ...Anything is better than your "thermal superconductors" that you then claim are different temperatures on different sides. Do you remember that is the second time you tried to pull that? I bet not. ***[Jane Q. Public,***

> ***2014-08-30]***

I've never claimed that, but this is the second time you've tried to pretend I have. Once again:

> > ... its outer temperature is 149.6F ... pretend the enclosing shell is a thermal superconductor, so its inner temperature is also 149.6F ... ***[Dumb Scientist]***
>
> So, first you postulate a thermal superconductor, and then assert that it has a far higher temperature on one side than on the other? What a magical world you must live in. ***[Jane Q. Public]***

No, I said both sides of a thermal superconductor enclosing shell are at 149.6F.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-30 4:47 (#47790329)
Oh, Jesus Christ. I actually started to have a serious discussion with you, then you had to obfuscate it and throw n all this other bullshit.

Every goddamned time. I thought we'd actually settle this scientifically, once and for all, but I see that you were never really interested in that anyway. I think other readers (which there WILL be) will conclude the same.

Really sorry if you're dying, but if so (I didn't believe it for a moment) you can go knowing that you abdicated on a chance to prove to the world that you can solve "civilization-paralyzing misinformation".

And I will know that you went exactly as you (from what you have shown me, anyway) deserve: unknown and deservedly so.

I offered to work through this with you reasonably, from start to finish. Even after you have repeatedly demonstrated that I have to reasonable obligation to you, to do so. You have refused.

End of discussion. End of ALL discussions with you, as far as I am concerned. Given that I have often offered to discuss this openly with you, and you have continually refused, then the matter is done. You lose by default because you refuse to lose like a man.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-08-30 4:56 (#47790367) Homepage Journal

> Spencer's INITIAL description of his thought experiment. As I have told you several time. This first, then more if you want to get into it. I will not discuss this with you in the other order, AS I HAVE TOLD YOU. Because until you get that right, you're not going to get the other one right. If you continue to argue the other case first, then we are done, and I will write you off as hopeless. ... No "enclosing shell". Two parallel plates. The original thought experiment is two parallel plates (we can make them of equal dimensions just to simplify, but it's not necessary). I repeat: we briefly discussed "even if it were enclosing" but that's a complication of the original, and we'll solve the original first. ***[Jane Q. Public, 2014-08-30]***

Once again, solving a problem without spherical symmetry means you'll have to solve

for equilibrium temperatures which aren't constant across the heated and passive plates. Those equilibrium temperatures wouldn't be simple numbers. They'd be complicated functions that would vary across the plate surfaces. Contrast that with a spherically symmetric enclosing plate, where equilibrium temperatures are just simple numbers.

Are you disputing those facts, or do you really not see which of these problems is more complicated?

> ... Also, I don't think we're assuming black bodies. The best we can realistically do is grey bodies that absorb in all the relevant frequencies under discussion. ... ***[Jane Q. Public, 2014-08-30]***

I already solved the problem for graybodies, and showed that the graybody equation reduces to the blackbody equation. That's why it's useful to solve the simpler blackbody problem first, to provide a sanity check on the more complicated solution.

> ...Anything is better than your "thermal superconductors" that you then claim are different temperatures on different sides. Do you remember that is the second time you tried to pull that? I bet not. ***[Jane Q. Public, 2014-08-30]***

I've never claimed that, but this is the second time you've tried to pretend I have. Once again:

> > ... its outer temperature is 149.6F ... pretend the enclosing shell is a thermal superconductor, so its inner temperature is also 149.6F ... ***[Dumb Scientist]***
>
> So, first you postulate a thermal superconductor, and then assert that it has a far higher temperature on one side than on the other? What a magical world you must live in. ***[Jane Q. Public]***

No, I said both sides of a thermal superconductor enclosing shell are at 149.6F.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-30 5:00 (#47790371)

No, I said both sides of a thermal superconductor enclosing shell are at 149.6F.

Haha. Here are your words.

At equilibrium, the enclosing shell radiates the same power out as the heated plate did before it was enclosed. But its area is 1.0025 times larger, so its outer temperature is 149.6F (338.5K) instead of 150.0F (338.7K).

A_h*T_h^4 = A_c2*T_c2^4 (Eq. 3)

For the moment, let's pretend the enclosing shell is a thermal superconductor, so its inner temperature is also 149.6F (338.5K). Energy conservation at equilibrium just inside the enclosing shell shows [dumbscientist.com] that the heated sphere will warm to an equilibrium temperature of 233.8F (385.3K)

But its inner temperature ISN'T 149.6F, because it's being heated from the inside, not the outside. You calculate a temperature **due to heating on the inside**, with its area, then account for a reduced temperature on the outside due to increased area, then try to turn around and say the temperature on the inside is the same as the outside.

I'm not changing a thing. This is the same criticism I gave before (just in more detail). And you're STILL full of shit, you pretender.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-30 5:07 (#47790395)
I'm repeating that, with the quotations done properly, so I can save it for posterity.

No, I said both sides of a thermal superconductor enclosing shell are at 149.6F.

Haha. Here are your words.

At equilibrium, the enclosing shell radiates the same power out as the heated plate did before it was enclosed. But its area is 1.0025 times larger, so its outer temperature is 149.6F (338.5K) instead of 150.0F (338.7K).

A_h*T_h^4 = A_c2*T_c2^4 (Eq. 3)

For the moment, let's pretend the enclosing shell is a thermal superconductor, so its inner temperature is also 149.6F (338.5K). Energy conservation at equilibrium just inside the enclosing shell shows [dumbscientist.com] that the heated sphere will warm to an equilibrium temperature of 233.8F (385.3K)

But its inner temperature ISN'T 149.6F, because it's being heated from the inside, not the outside. You calculate a temperature due to heating on the inside, with its area, then account for a reduced temperature on the outside due to increased area, then try to turn around and say the temperature on the inside is the same as the outside.

I'm not changing a thing. This is the same criticism I gave before (just in more detail). And you're STILL full of shit, you pretender. This is the most ludicrous thing I've heard coming from someone who claims to be a real scientist in years.

I've heard some "doozies", as they say, but it's doubly hilarious that I've pointed this out to you three times, and here you are still trying to defend it, rather than simply saying "Oops, I messed up."

It is A WASTE OF MY TIME to argue with you. You don't learn. I won't do it any more. And I'm going to give a copy of this to my grandchildren.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-08-30 5:13 (#47790421) Homepage Journal

Jane, you just quoted me saying that *"its outer temperature is 149.6F ... let's pretend the enclosing shell is a thermal superconductor, so its inner temperature is also 149.6F"*

Don't you see how my quote shows you were wrong to twice pretend that I'd claimed otherwise?

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-30 5:20 (#47790433)
Over a period of MORE THAN TWO YEARS, I have repeatedly tried to engage you in a thorough analysis of this experiment. EVERY TIME, you have done (usually incorrectly) a partial analysis, then declared the subject proved. But it never was.

When pressed, you resorted to the same kind of bullshit you have pulled here, with ad-hominem, not-sequiturs, and straw-men. NEVER daring to face the full problem in real detail.

Because you KNOW Latour was correct. And it isn't just him. TEXTBOOKS about practical applications of thermodynamics say so.

You have NEVER, ONCE, tackled the problem head-on. Always a little twist here, a little change there, let's ignore areal exposure to the ambient radiation, ad nauseum. Always weaseling sideways, never quite taking on the task of REFUTING LATOUR, even though that's what you claimed to be doing, with all your misdirection.

Well, I'm going to give you the benefit of the doubt, even though I honestly don't believe you deserve it. I am willing to concede that you really are a Kool-Aid drinker, and can't accept that the dogma isn't what you thought it was. That's preferable to believing that you're simply a malicious lying sonofabitch.

I am fucking well done here.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-08-30 5:47 (#47790497) Homepage Journal

> ... you KNOW Latour was correct. And it isn't just him. TEXTBOOKS about practical applications of thermodynamics say so. ... ***[Jane Q. Public, 2014-08-30]***

Again, I already showed you that MIT's equation reduces to my Eq. 1 for blackbodies, and is consistent with these equations and Eq. 1 in Goodman 1957. I've stressed that this thought experiment has been tested for decades in the real world. Radiation shields allow for more accurate measurements of gas temperatures using thermocouples:

"The greatest problem with measuring gas temperatures is combatting radiation loss. ... surround the probe with a radiation shield ... The thermocouple bead radiates to the shield which is much hotter than the surrounding walls. Thus the radiative loss and hence temperature error is significantly reduced. The shield itself radiates to the walls."

These radiation shields have been used since at least Daniels 1968 (PDF), and they work like Dr. Spencer's insulating plate. They slow radiative heat loss from the hotter thermocouple. If Jane and Dr. Latour's Sky Dragon Slayer misinformation is correct, why have accurate thermocouples used radiation shields since at least 1968? Isn't that an example of a "real world" situation that's ultimately what we're talking about?

> But its inner temperature ISN'T 149.6F ***[Jane Q. Public, 2014-08-30]***

After twice pretending that I'd claimed the inner temperature wasn't equal to its outer temperature of 149.6F... now you make that incorrect claim yourself? Bizarrely, I have to point out that a thermal superconductor enclosing shell will have an inner temperature equal to its outer temperature, exactly as I originally said.

This reminds me of your other similar mistake that you haven't acknowledged:

> A plate near the heat source is NOT even remotely the same as closing the drain on a bathtub, because the total power out of the system (it's a closed system with heat being **removed**, remember?) remains constant, as you have so conveniently observed. ***[Jane Q. Public, 2014-08-28]***

Completely backwards, as usual. I've never observed any such ridiculous nonsense. That's actually Jane's ridiculous "observation" which I've already tried to correct:

*"... Hopefully it's also clear that Jane's also wrong to claim that the power used by the cooler is required to be constant. The chamber wall **temperature** is held constant, so the power used by the cooler temporarily **decreases** after the enclosing plate is*

added, until it reaches equilibrium."

I've repeatedly said the electrical heating power is constant, and that adding an enclosing plate temporarily reduces power out until the heated plate warms to a higher equilibrium temperature.

> Over a period of MORE THAN TWO YEARS, I have repeatedly tried to engage you in a thorough analysis of this experiment. EVERY TIME, you have done (usually incorrectly) a partial analysis, then declared the subject proved. But it never was. When pressed, you resorted to the same kind of bullshit you have pulled here, with ad-hominem, not-sequiturs, and straw-men. NEVER daring to face the full problem in real detail. ... You have NEVER, ONCE, tackled the problem head-on. Always a little twist here, a little change there, let's ignore areal exposure to the ambient radiation, ad nauseum. Always weaseling sideways, never quite taking on the task of REFUTING LATOUR, even though that's what you claimed to be doing, with all your misdirection. ***[Jane Q. Public, 2014-08-30]***

You're claiming my calculations are somehow incorrect, but if you'd really found an error it would have been much faster for you to simply lead by example and show how to do the calculations correctly. That would constitute engaging in a thorough analysis of this experiment.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-30 10:43 (#47791465)
No, I'm not wrong. You calculated the outside temperature from the inside temperature, saying it's LOWER because of its greater area. This much is correct.

THEN you try to say that with a thermal superconductor, the inner temperature would be the same as outside. Except you just calculated that outside temperature from a WARMER interior. You quite literally can't have it both ways. EITHER you're claiming a superconductor has a different temperature on both sides, or you're claiming that the inside has 2 different temperatures simultaneously.
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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-30 11:23 (#47791717)
See? Same shit different day. You won't sit down and do the calculations start-to-finish, instead you do one small part, then start indulging in your hallmark game of out-of-context he-said, she-said, toss in a straw-man, then claim it's all proved. Here's a classic example of the kind of straw-man arguments you introduce:

I've stressed that this thought experiment has been tested for decades in the real world. Radiation shields allow for more accurate measurements of gas temperatures using thermocouples:

"The greatest problem with measuring gas temperatures is combatting radiation loss. ... surround the probe with a radiation shield ... The thermocouple bead radiates to the shield which is much hotter than the surrounding walls. Thus the radiative loss and hence temperature error is significantly reduced. The shield itself radiates to the walls."

Here is an excellent example of this (19.3.2), which illustrates why it is a straw-man argument that is not relevant to the problem at hand. In this case the walls are warmer, not cooler, and the radiation shield is blocking the thermocouple from the **radiation inward** from the chamber walls, so that it can get an accurate temperature reading of the air without interference from the walls. In your case, it is the opposite: the walls

are cooler than the thermocouple. But in neither case is the situation a representation of equilibrium (for example in this case, air is convecting away some of the heat of the thermocouple). The shield is absorbing and emitting radiation, too, it's just that it is isolated from the chamber walls, and so is closer to the ambient temperature **of the medium** being measured.

This is in no way related to our experiment at all. It is in a vacuum. There is no "medium" to measure, with an ambient temperature. Not even remotely. It's simply another illustration of the depths of hand-waving you will go to, rather than actually doing all the calculations on the actual experiment from start to finish.

All you're doing is tossing in more straw-men and irrelevancies. You won't do the actual experiment. The only reasonable conclusion to be drawn here is that you won't do it because you know you're wrong.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-30 11:32 (#47791779)
And I want to be clear about this: I'm not demanding anything from you. YOU are the one who proclaimed Latour wrong, therefore it is **your** burden to demonstrate that he actually is, by showing exactly where he is incorrect.

I really don't give a damn whether you believe it or not. I'm not the one following you around, casting personal aspersions against YOU. I've just been defending myself from YOUR malicious attacks.

The whole point: You claimed Latour was wrong. But you refuse to back up your claim by showing WHERE in his calculations he was incorrect. That's your burden and you haven't been meeting it. Until you do, you have no argument to make. You can throw all the ad-hominem and straw-man arguments and irrelevancies in that you want, but none of it proves you correct. Until you actually show where Latour made a mistake, in his actual calculations related to this experiment, you're wrong by default.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-08-30 12:29 (#47792031) Homepage Journal

> No, I'm not wrong. You calculated the outside temperature from the inside temperature, saying it's LOWER because of its greater area. This much is correct. THEN you try to say that with a thermal superconductor, the inner temperature would be the same as outside. Except you just calculated that outside temperature from a WARMER interior. You quite literally can't have it both ways. EITHER you're claiming a superconductor has a different temperature on both sides, or you're claiming that the inside has 2 different temperatures simultaneously. ***[Jane Q. Public, 2014-08-30]***

Remember that the inner surface of the enclosing shell is different than the surface of the heated plate. The inner and outer surfaces of the enclosing shell are at exactly the same temperature because it's a thermal superconductor. That's what I've always been saying, despite your attempts to pretend otherwise.

The surface of the heated plate at equilibrium, however, **is** warmer than the inner surface of the enclosing shell. It has to be.

> Here is an excellent example of this (19.3.2), which illustrates why it is a straw-man argument that is not relevant to the problem at hand. In this case the walls are warmer, not cooler, and the radiation shield is blocking

> the thermocouple from the **radiation inward** from the chamber walls, so that it can get an accurate temperature reading of the air without interference from the walls. In your case, it is the opposite: the walls are cooler than the thermocouple. But in neither case is the situation a representation of equilibrium (for example in this case, air is convecting away some of the heat of the thermocouple). The shield is absorbing and emitting radiation, too, it's just that it is isolated from the chamber walls, and so is closer to the ambient temperature **of the medium** being measured. This is in no way related to our experiment at all. It is in a vacuum. There is no "medium" to measure, with an ambient temperature. Not even remotely. ***[Jane Q. Public, 2014-08-30]***

I've repeatedly linked to that excellent example. Despite your incoherent protests, it's a relevant example where a passive plate reduces radiative heat loss from a warmer source, warming it to a higher equilibrium temperature. It's a real world example which shows Jane and the Sky Dragon Slayers are wrong.

> See? Same shit different day. You won't sit down and do the calculations start-to-finish, instead you do one small part, then start indulging in your hallmark game of out-of-context he-said, she-said, toss in a straw-man, then claim it's all proved. ... It's simply another illustration of the depths of hand-waving you will go to, rather than actually doing all the calculations on the actual experiment from start to finish. All you're doing is tossing in more straw-men and irrelevancies. You won't do the actual experiment. The only reasonable conclusion to be drawn here is that you won't do it because you know you're wrong. ***[Jane Q. Public, 2014-08-30]***

Don't you see the irony here? I've repeatedly done the calculations "start-to-finish" by deriving and solving equations describing the final equilibrium temperature of the enclosed plate using increasingly realistic scenarios. I've repeatedly told you that you'd only be able to understand this thought experiment if you did the same. But you **still** haven't. Haven't you noticed that I'm the only one here deriving equations and doing calculations?

Is the only reasonable conclusion to be drawn here that you won't even attempt to solve this problem because you know you're wrong?

> And I want to be clear about this: I'm not demanding anything from you. YOU are the one who proclaimed Latour wrong, therefore it is **your** burden to demonstrate that he actually is, by showing exactly where he is incorrect. ... **The whole point:** You claimed Latour was wrong. But you refuse to back up your claim by showing WHERE in his calculations he was incorrect. That's your burden and you haven't been meeting it. Until you do, you have no argument to make. You can throw all the ad-hominem and straw-man arguments and irrelevancies in that you want, but none of it proves you correct. Until you actually show where Latour made a mistake, in his actual calculations related to this experiment, you're wrong by default. ***[Jane Q. Public, 2014-08-30]***

Once again, Dr. Latour and Jane claim that enclosing the heated plate wouldn't warm it. I've shown that this would violate conservation of energy.

In physics, violating conservation of energy is a pretty big mistake.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-30 13:02 (#47792147)
Don't you see that you threw in this whole "thermal superconductor" schtick without considering what properties a thermal superconductor must actually have?

In order to superconduct, it must be the same temperature everywhere, always. The only way this would be even remotely possible were if it were a perfect radiator, with emissivity of 1. It would also be a perfect absorber, absorptivity of 1. Regardless of

wavelength.

So while this might not technically be true, for all **practical** purposes it is: a thermal superconductor would be completely transparent to all radiation, and there is no way to heat it or cool it in relation to its surroundings. It has no "thermal mass".

So it would have absolutely no effect on anything in this experiment. For practical purposes, it would not exist.

Your idea that you can get around this by placing some kind of thin lining on its interior doesn't work. It's still as though it weren't there at all... all you have left for practical purposes is the thin shell, nothing else.

Trying to use it as part of your demonstration won't wash. Every time you try to demonstrate something with it, you end up contradicting yourself. (Which I have pointed out to you many times now. Not just twice, more like 5 or 6 times.)

That's why I say: no more prevarication. No more beating about the bush. Take Spencer's **original** challenge, apply Latour's thermodynamic treatment of it, and show where it is wrong.

Anything else constitutes failure to back up your claim that Latour is wrong and -- as you have said more than once -- some kind of nutcase. You've had more than 2 years. That is plenty.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-08-30 14:10 (#47792445) Homepage Journal

> Don't you see that you threw in this whole "thermal superconductor" schtick without considering what properties a thermal superconductor must actually have? In order to superconduct, it must be the same temperature everywhere, always. The only way this would be even remotely possible were if it were a perfect radiator... ***[Jane Q. Public, 2014-08-30]***

Superconductors are distinguished from aluminum by internal properties, not radiative surface properties. That's because conduction happens **inside** materials, whereas radiation is emitted and absorbed on surfaces.

> ... The only way this would be even remotely possible were if it were a perfect radiator, with emissivity of 1. It would also be a perfect absorber, absorptivity of 1. Regardless of wavelength. So while this might not technically be true, for all **practical** purposes it is: a thermal superconductor would be completely transparent to all radiation... ***[Jane Q. Public, 2014-08-30]***

No. As I've explained, emissivity = 1 and absorptivity = 1 is the definition of a blackbody. A completely transparent material would have transmittance = 1 and absorptivity = 0. Blackbodies **can't** be transparent.

> ... a thermal superconductor ... has no "thermal mass". So it would have absolutely no effect on anything in this experiment. For practical purposes, it would not exist. Your idea that you can get around this by placing some kind of thin lining on its interior doesn't work. It's still as though it weren't there at all... all you have left for practical purposes is the thin shell, nothing else. ... ***[Jane Q. Public, 2014-08-30]***

I've already solved this problem with an aluminum enclosing shell rather than a thermal superconductor shell. Both shells warm the heated plate to ~233.8F.

> ... That's why I say: no more prevarication. No more beating about the bush. Take Spencer's **original** challenge, apply Latour's thermodynamic treatment of it, and show where it is wrong. Anything else constitutes

> failure to back up your claim that Latour is wrong and -- as you have said more than once -- some kind of nutcase. You've had more than 2 years. That is plenty. ***[Jane Q. Public, 2014-08-30]***

Dr. Spencer's original challenge included the possibility of a fully-enclosing passive plate. And so did Dr. Latour. Note that Dr. Latour never specifies the dimensions of the plates (as Jane began to) before wrongly concluding that T remains 150. This means his incorrect conclusion must apply to all geometries, including a fully-enclosing passive plate. In fact, notice that Dr. Latour explicitly allows for K = 1 and k = 1, which describes a fully-enclosing blackbody passive plate.

So Dr. Latour wrongly claimed that a fully-enclosing passive plate wouldn't warm the heated plate. I've shown that his claim violates conservation of energy. As long as the shell is warmer than the chamber walls (which it is), the net radiative heat loss from the heated plate is reduced. So power in > power out, which means the heated plate either warms or energy isn't conserved. Just like how a bathtub fills up.

Since you just linked to this excellent example, did you notice that MIT solved this problem at the very top and got a completely different answer than Dr. Latour?

Again, note that MIT's final expression reduces to my Eq. 1 for blackbodies, and is consistent with these equations and Eq. 1 in Goodman 1957.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-31 20:48 (#47797987)

Remember that the inner surface of the enclosing shell is different than the surface of the heated plate. The inner and outer surfaces of the enclosing shell are at exactly the same temperature because it's a thermal superconductor. That's what I've always been saying, despite your attempts to pretend otherwise.

I quoted your words above.

At equilibrium, the enclosing shell radiates the same power out as the heated plate did before it was enclosed. But its area is 1.0025 times larger, so its outer temperature is 149.6F (338.5K) instead of 150.0F (338.7K).

In order for what you say to be correct, then the "enclosing shell" you refer to is not the heated plate enclosing the source. Which would mean you were talking about a completely different experiment, not even the one Spencer mentioned with the heated plate enclosing the source.

I'm not interested. Original experiment. Latour's treatment of it. Show where he was wrong. Period. Stop prevaricating.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-08-31 21:04 (#47798049)

Superconductors are distinguished from aluminum by internal properties, not radiative surface properties. That's because conduction happens inside materials, whereas radiation is emitted and absorbed on surfaces.

You're not thinking.

We're talking about the context of SPENCER'S experiment. The only heat transfer in or out is radiation. It order for it to actually superconduct all the heat absorbed, it has

to dispose of that heat somehow. The only way it has to do that is to super-radiate as well (emissivity very close to 1). This is the only logical conclusion. Otherwise it could not be a thermal superconductor; it would build up heat and HAVE TO conduct it away more slowly, like any other material. And there is a similar argument for absorptivity.

You keep wanting to have things both ways but that isn't going to work.

I am aware that the only thing that has an emissivity and absorptivity of 1 is a black body. I'm not stupid. But your hypothetical thermal superconductor could not store heat like a black body and remain a superconductor. That's a contradiction. So it's a different creature, from your imagination. This is why I say: leave it out. There is no way you can try to demonstrate anything else with it, either, without leading to a contradiction. And it's not part of the original experiment anyway; it's nothing but misdirection.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-08-31 21:59 (#47798285) Homepage Journal

> At equilibrium, the enclosing shell radiates the same power out as the heated plate did before it was enclosed. But its area is 1.0025 times larger, so its outer temperature is 149.6F (338.5K) instead of 150.0F (338.7K).
>
> In order for what you say to be correct, then the "enclosing shell" you refer to is not the heated plate enclosing the source. Which would mean you were talking about a completely different experiment, not even the one Spencer mentioned with the heated plate enclosing the source. ***[Jane Q. Public, 2014-08-31]***

We might be talking past each other. What you're calling the "source" is what I've been calling the "heated plate" with temperature "T_h" in all my equations. I've called the other enclosing plate the "cold plate" with temperature "T_c". As I've repeatedly and consistently stressed, "T_c" is only identical on both sides of the enclosing cold plate if it's a thermal superconductor.

I'm sorry for any confusion this caused, but as you can tell I really am talking about the experiment Dr. Spencer mentioned. We're just using different words, and again I'm sorry for not noticing this miscommunication earlier. I take full responsibility.

> ... But your hypothetical thermal superconductor could not store heat like a black body and remain a superconductor. That's a contradiction. So it's a different creature, from your imagination. This is why I say: leave it out. There is no way you can try to demonstrate anything else with it, either, without leading to a contradiction. And it's not part of the original experiment anyway; it's nothing but misdirection. ***[Jane Q. Public, 2014-08-31]***

We'll have to agree to disagree about thermal superconductors. I'm sorry for trying to simplify the problem in a way that ultimately just caused us to waste so much time. Again, I take full responsibility.

But again, I've already solved this problem with an aluminum enclosing shell, and it also warms the heated plate (aka Jane's "source") to ~233.8F.

> ... I'm not interested. Original experiment. Latour's treatment of it. Show where he was wrong. Period. Stop prevaricating. ***[Jane Q. Public, 2014-08-31]***

That **was** Dr. Spencer's original challenge. He included the possibility of a fully-enclosing passive plate. And so did Dr. Latour's treatment of it. If you don't agree, please show where Dr. Latour specifies the dimensions of the plates before wrongly concluding that T remains 150. Also, why did Dr. Latour explicitly allow for K = 1 and

k = 1, which describes a fully-enclosing blackbody passive plate?

Dr. Latour really did wrongly claim that a fully-enclosing passive plate wouldn't warm the heated plate (aka Jane's "source"). I've shown that his claim violates conservation of energy. As long as the shell is warmer than the chamber walls (which it is), the net radiative heat loss from the heated plate (aka Jane's "source") is reduced. So power in > power out, which means the heated plate either warms or energy isn't conserved. Just like how a bathtub fills up.

"Stop prevaricating"? Really? I've showed that Dr. Latour was wrong because his claim violates conservation of energy. Again, in physics that's a really big mistake.

Since you just linked to this excellent example, did you notice that MIT solved this problem at the very top and got a completely different answer than Dr. Latour?

How is that prevaricating? Did you even read MIT's solution to this problem? They show how to solve it **correctly**.

Again, note that MIT's final expression reduces to my Eq. 1 for blackbodies, and is consistent with these equations and Eq. 1 in Goodman 1957.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-01 11:28 (#47801563)

As I've repeatedly and consistently stressed, "T_c" is only identical on both sides of the enclosing cold plate if it's a thermal superconductor.

We have never disagreed on this. The problem is that there is no such thing as a thermal superconductor of this kind, and you aren't seeing that it leads to contradictions. The only way it could exist would be if it had NO thermal effect on its surroundings whatever. So it's the ultimate straw-man argument. There is no way it can be legitimately used to demonstrate anything.

Since you just linked to this excellent example, did you notice that MIT solved this problem at the very top and got a completely different answer than Dr. Latour?

No, they didn't, because **it's a different problem**, being given a theoretical treatment. You keep doing that, but I'm not buying. Two infinite plates, neither of which is heated, is not even remotely the same situation, and it's also theoretical only. They're not taking into account certain real-world factors pertaining to Spencer's experiment. Latour does. Not that they're doing anything wrong... given the **context** of their situation: infinite non-heated grey bodies. This is not Spencer's experiment.

I've showed that Dr. Latour was wrong because his claim violates conservation of energy. Again, in physics that's a really big mistake.

No, you didn't. You did not point to a calculation he performed on Spencer's situation and prove it wrong. You took what you incorrectly called an analogous situation and called that wrong. Which has been my whole point here. You keep claiming something else represents Spencer's experiment, but you won't tackle Spencer's **actual, original** experiment. You have consistently refused, for over 2 years.

You can toss around equations all you like, but if you're not applying them to the experiment actually under discussion (and you haven't been), you're still not proving anything. You're just moving the goalposts.

And that's why I've said I'm out of here. You continue to refuse to actually do what you said you'd done: refute Latour's treatment of Spencer's challenge. You can keep prevaricating and beating around the bush and straw-manning and moving the goalposts, and I'll just keep telling you why you're wrong. Or rather, no I won't. I've done that too many times already.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-01 11:48 (#47801705)
And I'm going to repeat this, just one more time, in the (probably vain) effort to get you to get it straight:

Take Spencer's **original** experiment, with two separated, non-enclosing plates, and show SPECIFICALLY where Latour was wrong in his calculations. THEN, if you like, you can move on to the enclosed-source situation.

I'm not buying anything else. No straw-man, no moved goalposts, no new introduced factors like "thermal superconductors".

Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-01 12:29 (#47801979) Homepage Journal

> ... The problem is that there is no such thing as a thermal superconductor of this kind, and you aren't seeing that it leads to contradictions. The only way it could exist would be if it had NO thermal effect on its surroundings whatever. So it's the ultimate straw-man argument. There is no way it can be legitimately used to demonstrate anything. ***[Jane Q. Public, 2014-09-01]***

Again, we'll have to agree to disagree about thermal superconductors. That's why I've repeatedly pointed out that I've already solved this problem with an aluminum enclosing shell, and it also warms the heated plate (aka Jane's "source") to ~233.8F.

> No, they didn't, because **it's a different problem**, being given a theoretical treatment. You keep doing that, but I'm not buying. Two infinite plates, neither of which is heated, is not even remotely the same situation, and it's also theoretical only. They're not taking into account certain real-world factors pertaining to Spencer's experiment. Latour does. Not that they're doing anything wrong... given the **context** of their situation: infinite non-heated grey bodies. This is not Spencer's experiment. ***[Jane Q. Public, 2014-09-01]***

No, it's exactly the same problem. The same infinite sum of absorption and reflection. The plates are only "infinite" to avoid having to model fringing field effects around the plate edges. And note that Dr. Latour doesn't model edge effects either, so his plates are either infinite or the passive plate completely encloses the "source". Either way, there would be no edges.

Notice that the first example MIT applies their final equation to is a thermos bottle where the inside wall is heated by hot fluid.

> You did not point to a calculation he performed on Spencer's situation and prove it wrong. You took what you incorrectly called an analogous situation and called that wrong. Which has been my whole point here. You keep claiming something else represents Spencer's experiment, but you won't tackle Spencer's **actual, original** experiment. You have consistently refused, for over 2 years. ... You continue to refuse to actually do what you said you'd done: refute Latour's treatment of Spencer's challenge. ***[Jane Q. Public, 2014-09-01]***

Again, Dr. Spencer's **actual, original** experiment included the possibility of a fully-enclosing passive plate. And so did Dr. Latour's treatment of it. If you don't agree, please show where Dr. Latour specifies the dimensions of the plates before wrongly concluding that T remains 150.

In fact, as far as I can tell **nobody's** specified the plate dimensions except for me. Since the argument I'm refuting never specified the plate dimensions, why would the plate dimensions matter?

> ... I repeat: get the experiment with the two separate plates (actively heated plate and passive plate) right first. Then you can move on to a fully-enclosing plate. You say it's simpler but in a way it's not; you're trying to ride a bicycle when you haven't even managed to ride your tricycle without falling off. ... ***[Jane Q. Public, 2014-08-29]***
>
> ... Take Spencer's **original** experiment, with two separated, non-enclosing plates, and show SPECIFICALLY where Latour was wrong in his calculations. THEN, if you like, you can move on to the enclosed-source situation. ... ***[Jane Q. Public, 2014-09-01]***

Once again, the original experiment included both scenarios: fully-enclosed and not-fully-enclosed. We can agree that one should solve simpler problems before moving on to more complex problems, but we seem to disagree about which of the scenarios in Dr. Spencer's original experiment is simpler.

Again, solving a problem without spherical symmetry means you'll have to solve for equilibrium temperatures which aren't constant across the heated and passive plates. Those equilibrium temperatures wouldn't be simple numbers. They'd be complicated functions that would vary across the plate surfaces. Contrast that with a spherically symmetric enclosing plate, where equilibrium temperatures are just simple numbers.

Are you disputing those facts, or do you really not see which of these problems is more complicated?

I don't have enough time to program a finite element model to account for the fact that a non-fully-enclosing plate would cause plate temperatures to vary across their surfaces. But even if I did, the first thing I'd do after debugging it would be to check the finite element solution in a case where a simple analytic solution can be obtained. Namely, a fully-enclosing passive plate, where the plate temperatures are simple numbers.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-01 14:14 (#47802579)

Again, we'll have to agree to disagree about thermal superconductors. That's why I've repeatedly pointed out that I've already solved [dumbscientist.com] this problem with an aluminum enclosing shell, and it also warms the heated plate (aka Jane's "source") to ~233.8F.

You solved **part** of the problem, under different conditions, as I have repeatedly pointed out.

Let's get this straight: rather than tackling the actual problem you claimed to have refuted, you solved a different problem under different conditions, and called that refutation.

Even if your analysis of **that** problem were 100% correct, this is the very definition of a straw-man argument.

So why do you refuse to just take Spencer's **original** challenge, with two non-enclosing plates (i.e., the challenge I originally presented to you), and simply show me where Latour was wrong about it, as you have so often claimed? After 2 years I can only conclude that you are not able to do it. I don't know of a single other plausible reason why you have refused to do this.

Again, Dr. Spencer's actual, original experiment included the possibility of a fully-enclosing passive plate.

That got a **minor mention** later in his article, is not included in his diagrams, and is NOT the problem I originally presented to you. As I have said many times before, AFTER you refute Latour's calculations regarding Spencer's **original** challenge, which did not have the passive body enclosing the heat source, I would be happy to move on to the other issue... with no additional stipulations or additions to the problem Spencer describes. But you haven't gotten there yet. Cart before the horse, with a straw-man riding the cart.

That was the challenge I presented you you. For 2 years now, you have been going far out of your way to do everything BUT that, which leads me to believe that is your new custom definition of "rebut". (I would say that last sentence is a jest, but in fact it is only partly so.)

We can agree that one should solve simpler problems before moving on to more complex problems, but we seem to disagree about which of the scenarios in Dr. Spencer's original experiment is simpler.

That wasn't my point. I'm not saying we should solve simpler problems before moving on to more complex problems. I'm saying the challenge originally given to you is to be met before moving on to something else and claiming it irrelevant. I only wrote that "in a way" it's not simpler. But again that is beside the point, which you appear to be attempting to sidestep again.

Again, solving a problem without spherical symmetry means you'll have to solve for equilibrium temperatures which aren't constant across the heated and passive plates. Those equilibrium temperatures wouldn't be simple numbers. They'd be complicated functions that would vary across the plate surfaces. Contrast that with a spherically symmetric enclosing plate, where equilibrium temperatures are just simple numbers.

I only claimed Latour was correct "with a reasonable degree of precision". He states himself in his original article that these are working approximations used for engineering, which in practice must have minor adjustments made experimentally for final product (when dealing with things like furnaces, which often have complex internal geometry). It's good enough for real world engineering, according to both Latour and the textbooks. So you don't get a pass on that basis, either.

Why don't you just shut up and do it? Why have you been so mightily struggling, like a fish on a hook, to avoid it?

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-01 14:49 (#47802739) Homepage Journal

> I'm not saying we should solve simpler problems before moving on to more complex problems. ***[Jane Q. Public, 2014-09-01]***

Okay, then we disagree. It's always helpful to solve simpler problems before moving on to more complex problems. The simpler problem is easier to learn, and often serves as a sanity check on the more complex problem.

> That got a **minor mention** later in his article, is not included in his diagrams, and is NOT the problem I originally presented to you. As I have said many times before, AFTER you refute Latour's calculations regarding Spencer's **original** challenge, which did not have the passive body enclosing the heat source, I would be happy to move on to the other issue... with no additional stipulations or additions to the problem Spencer describes. But you haven't gotten there yet. Cart before the horse, with a straw-man riding the cart. ***[Jane Q. Public, 2014-09-01]***

Again, Latour's calculations allowed for K = 1: *"K is the fraction of radiation from the first bar absorbed by the second colder bar, 0 < K <=1."*

The only way K = 1 is if the cold plate completely encloses the first heated source. Otherwise, radiation from the side of the source opposite the cold plate couldn't

possibly be absorbed by the cold plate, which would force K < 1. So once again, the fact that Dr. Latour included the possibility that K = 1 means that his claim applies to all geometries.

If not, why doesn't he deal with edge effects? The only ways to eliminate edge effects are if the plates are infinite, or if the cold plate completely encloses the heated source.

> Why don't you just shut up and do it? Why have you been so mightily struggling, like a fish on a hook, to avoid it? ***[Jane Q. Public, 2014-09-01]***

Again, I don't have enough time to program a finite element model to account for the fact that a non-fully-enclosing plate would cause plate temperatures to vary across their surfaces. But even if I did, the first thing I'd do after debugging it would be to check the finite element solution in a case where a simple analytic solution can be obtained. Namely, a fully-enclosing passive plate, where the plate temperatures are simple numbers.

By the way, since you keep insisting that only a particular geometry could refute Dr. Latour's treatment, could you please show where he specified the dimensions of the plates? Or where Dr. Spencer did? Otherwise, even if I had enough time to do so, how could I possibly program this complicated finite element model with the specific geometry that would finally convince you the Slayers are wrong?

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-01 21:57 (#47804455)

Again, I don't have enough time to program a finite element model to account for the fact that a non-fully-enclosing plate would cause plate temperatures to vary across their surfaces.

I've already explained why this is BS excuse. Latour didn't need finite element modeling to come up with a **reasonably precise** answer, and neither would you. Further, you don't have to explain to me what finite element modeling is. I was doing large-scale finite element models back in the 90s.

By the way, since you keep insisting that only a particular geometry could refute Dr. Latour's treatment

There you go again. Same shit different day. I have written no such thing. Back to the original context: I asked you to refute Latour's treatment of Spencer's challenge, as shown in his diagrams and descriptions of his original article on the subject. I did not claim "only" this would refute Latour. But this is indisputably true: only this would refute Latour **about this**. Not the "enclosing" variant of the problem. I'm simply sticking to the original challenge. I am not claiming it's the "only" thing that could possibly refute Latour at all. It's just that it is the specific thing I challenged you to refute. I have no reason to apologize or make excuses for sticking to the original challenge as I first presented it to you.

The challenge originally described by Spencer (including his diagrams) represents approximately the general case. You claim (I disagree but I don't want to get into that here, because it's irrelevant to **this** challenge) that you have refuted Latour in a specific case but not in the general one.

I simply asked why you refuse to show where Latour was wrong in Spencer's **original** challenge, not the "enclosing" variant of it. That was my original challenge to you, and there is no ambiguity about it. I have stuck to that and haven't changed it.

I am aware Latour's equations allow for K=1, but that's just one special case, not the general solution, and not the original challenge Spencer described. Both Spencer and Latour say "even if..." but again that is not the general case. I had reasons for bringing up the specific problem that Spencer originally described but those reasons are my own, and I don't really owe you an explanation. You can take the challenge or pass on it, but if you pass on it, you haven't met it.

could you please show where he specified the dimensions of the plates?

Why? It might be convenient, but it's hardly necessary to demonstrate the point. Just the general geometry and some rough ratios. Neither party stipulated a "specific" geometry, just a general description of the basic problem. And that's fine, because that is all that is actually needed. If you want to solve for specific dimensions go ahead. You might find it easier to do that way, and the answer would be unambiguous. I don't really care.

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- **Jane/Lonny Eachus goes Sky Dragon Slayer** (Score:2)

by khayman80 (824400) on 2014-09-01 22:21 (#47804527) Homepage Journal

> I've already explained why this is BS excuse. Latour didn't need finite element modeling to come up with a **reasonably precise** answer, and neither would you. ***[Jane Q. Public, 2014-09-01]***

Latour's answer is ridiculous Sky Dragon Slayer nonsense which violates conservation of energy, as I've shown.

Once again, solving a problem without spherical symmetry means you'll have to solve for equilibrium temperatures which aren't constant across the heated and passive plates. Those equilibrium temperatures wouldn't be simple numbers. They'd be complicated functions that would vary across the plate surfaces. Contrast that with a spherically symmetric enclosing plate, where equilibrium temperatures are just simple numbers.

Are you disputing that equilibrium temperatures for a non-enclosing plate would vary across the plate surfaces rather than being simple numbers like with a spherically symmetric fully enclosing plate?

> I simply asked why you refuse to show where Latour was wrong in Spencer's **original** challenge, not the "enclosing" variant of it. ***[Jane Q. Public, 2014-09-01]***

Because, unless you dispute the above facts, that would require a complicated finite element model due to its lack of spherical symmetry. I simply don't have that much time left. And again, we'd have to test that complicated model in a case where an analytic solution is available anyway...

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- **Jane/Lonny Eachus goes Sky Dragon Slayer** (Score:2)

by khayman80 (824400) on 2014-09-01 23:41 (#47804723) Homepage Journal

Maybe I should explain what I meant by saying that equilibrium temperatures for a non-enclosing plate would vary across the plate surfaces. Consider Dr. Spencer's first illustration. Presumably the heated plate at "150F" has finite conductivity, so its lack of spherical symmetry means that its corners will be cooler than the plate's side's midpoints. That's because the corners are closer to the cold chamber walls than those midpoints.

An integral over the heated plate's surface might average to "150F" but (unlike a spherically symmetric plate) it can't have that temperature everywhere as long as it has finite conductivity. But at least the single heated plate has bilateral symmetry; the left and right hand side midpoints have the same temperature.

Adding a cool plate removes even that bilateral symmetry. The left hand side's midpoint warms the least because it's still radiating to the 0F chamber walls. The right

hand side's midpoint warms the most because it's now radiating to the (initially) 100F cold plate.

Since enclosing a spherically symmetric plate warms it from 150F to ~233.8F for area ratios similar to Earth's, the right hand side's midpoint won't warm past ~233.8F. But it has to warm to conserve energy because at equilibrium power in = power out.

I can't be more specific without programming a finite element model. But Dr. Latour never even allowed for the heated plate's temperature to be different on each side. As long as we're only considering materials with finite conductivity, this would only be possible for a spherically symmetric enclosing plate.

Dr. Latour's answer wasn't "reasonably precise". He claimed that the heated plate wouldn't warm **at all** when the cold plate was added, even if it completely enclosed the heated plate such that K = 1. This is a specific prediction of "0.0000...F" warming. Since energy conservation means that adding a cold plate **has to** warm the heated plate, he's only off by a factor of infinity.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-01 23:45 (#47804733)

Latour's answer is ridiculous Sky Dragon Slayer nonsense which violates conservation of energy, as I've shown.

It is the engineering textbook answer. Claiming it is nonsense does not make it so. It was your own model that violated conservation of energy. But to see why, it's easiest to solve the general case first, then look at a specific case. I told you I had reasons to solve the general case first.

But you're just continuing to refuse, as I expected. After 2 years, I consider that to be an admission of defeat. Asking me to assume anything else is asking far too much.

Once again, solving a problem without spherical symmetry means you'll have to solve for equilibrium temperatures which aren't constant across the heated and passive plates. Those equilibrium temperatures wouldn't be simple numbers. They'd be complicated functions that would vary across the plate surfaces. Contrast that with a spherically symmetric enclosing plate, where equilibrium temperatures are just simple numbers.

Derived equations are available which give approximations with reasonable precision. Or you can assume particular dimensions of the general case which simplify the math. I said that was a bullshit excuse, I meant it when I said it, and I still mean it.

Are you disputing that equilibrium temperatures for a non-enclosing plate would vary across the plate surfaces rather than being simple numbers like with a spherically symmetric fully enclosing plate?

I am disputing that given reasonable chosen dimensions it is anywhere near an intractable problem.

Because, unless you dispute the above facts, that would require a complicated finite element model due to its lack of spherical symmetry. I simply don't have that much time left. And again, we'd have to test that complicated model in a case where an analytic solution is available anyway...

Well, then, I guess you do admit defeat. It doesn't take much time to obtain a textbook on the subject (you were given references 2 years ago and it's not that hard to find others). But you choose what you want to do. I warned you that if you really do have limited time, you would be better off spending your time elsewhere.

I don't wish harm on anybody. But I have a low tolerance for bullshit and I don't appreciate being attacked under false pretenses. The only "attacks" I have made against you have been in self defense. Just maybe it's time to leave me alone.

Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-02 0:06 (#47804793) Homepage Journal

> ... It is the engineering textbook answer. Claiming it is nonsense does not make it so. It was your own model that violated conservation of energy. But to see why, it's easiest to solve the general case first, then look at a specific case. I told you I had reasons to solve the general case first. ... Well, then, I guess you do admit defeat. It doesn't take much time to obtain a textbook on the subject (you were given references 2 years ago and it's not that hard to find others) ... ***[Jane Q. Public, 2014-09-01]***

No, the PSI Sky Dragon Slayers told you it's the engineering textbook answer. I showed you MIT's final expression which reduces to my Eq. 1 for blackbodies, and is consistent with these equations and Eq. 1 in Goodman 1957. Physicists and engineers have been using thermodynamics for decades in the real world that contradicts Dr. Latour's Slayer nonsense.

That's why Jane, Dr. Latour and the rest of the Slayers disagree with the American Institute of Physics, the American Physical Society, the Australian Institute of Physics, and the European Physical Society.

> ... I am disputing that given reasonable chosen dimensions it is anywhere near an intractable problem. ... ***[Jane Q. Public, 2014-09-01]***

I never said the problem is intractable. Just that it's more complicated than the spherically symmetric problem. Again, do you dispute that equilibrium temperatures for a non-enclosing plate would vary across the plate surfaces rather than being simple numbers like with a spherically symmetric fully enclosing plate?

Maybe I should explain that. Consider Dr. Spencer's first illustration. Presumably the heated plate at "150F" has finite conductivity, so its lack of spherical symmetry means that its corners will be cooler than the plate's side's midpoints. That's because the corners are closer to the cold chamber walls than those midpoints.

An integral over the heated plate's surface might average to "150F" but (unlike a spherically symmetric plate) it can't have that temperature everywhere as long as it has finite conductivity. But at least the single heated plate has bilateral symmetry; the left and right hand side midpoints have the same temperature.

Adding a cool plate removes even that bilateral symmetry. The left hand side's midpoint warms the least because it's still radiating to the 0F chamber walls. The right hand side's midpoint warms the most because it's now radiating to the (initially) 100F cold plate.

Since enclosing a spherically symmetric plate warms it from 150F to ~233.8F for area ratios similar to Earth's, the right hand side's midpoint won't warm past ~233.8F. But it has to warm to conserve energy because at equilibrium power in = power out.

I can't be more specific without programming a finite element model. But Dr. Latour never even allowed for the heated plate's temperature to be different on each side. As long as we're only considering materials with finite conductivity, this would only be possible for a spherically symmetric enclosing plate.

> ... Derived equations are available which give approximations with reasonable precision. Or you can assume particular dimensions of the general case which simplify the math. I said that was a bullshit excuse, I meant it when I said it, and I still mean it. ... ***[Jane Q. Public, 2014-09-01]***

Dr. Latour's answer wasn't "reasonably precise". He claimed that the heated plate wouldn't warm **at all** when the cold plate was added, even if it completely enclosed the heated plate such that K = 1. This is a specific prediction of "0.0000...F" warming. Since energy conservation means that adding a cold plate **has to** warm the heated

plate, he's only off by a factor of infinity.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-02 12:05 (#47809719)

No, the PSI Sky Dragon Slayers told you it's the engineering textbook answer. I showed you MIT's final expression which reduces to my Eq. 1 for blackbodies, and is consistent with these equations and Eq. 1 in Goodman 1957. Physicists and engineers have been using thermodynamics for decades in the real world that contradicts Dr. Latour's Slayer nonsense.

Utter nonsense. You showed me an answer for a completely different problem which does not apply here. You keep doing this. I said I wouldn't do this, but here are just SOME ways your analysis is **completely full of shit**. Here is what you stated on your website and elsewhere:

Electric input of 509 W/m2 is constant and the walls are held at 0ÂF (255K). Therefore, the second plate has to radiate the same power out as the heated plate did before it was enclosed. So energy conservation at equilibrium requires that the second plate be at 150ÂF (339K).

Utter nonsense. The temperature of the outside of your enclosing sphere is determined entirely by its absorption minus its emission, with absorptivity and emissivity factored in. If your interior heat source were emitting at (your figure) 509W/m^2, and that is being absorbed by the interior surface of your enclosing sphere (which MUST have larger radius than the source, since they can't contact), then your outside surface, being of even larger area, must therefore be colder. (This is if we assume a black body and can ignore emissivity and absporptivity... which Spencer did not actually do. He mentioned black bodies but did not say he was applying the idea to his thought experiment. I am saying that **even if** they were black bodies, this would be true.)

So you're INVENTING ENERGY OUT OF THIN AIR. Then, as if that were not enough, you try to pull off THIS gem, which is really quite hilarious. I know I keep using that word, but that's because it's hilarious:

But the second plate also radiates the same power in, toward the enclosed heated plate. Just like the cold chamber walls do. Now consider conservation of energy just inside the second plate (but outside the first) at equilibrium. We can solve for the insulated heated plateâ(TM)s temperature using Eq. 1 by setting Tc = 150ÂF (339K). That yields an insulated heated plate temperature of 235ÂF (386K).

No, it doesn't! The irradiation is total for the entire hollow sphere, not for each surface. You have to divide the total irradiance by the **entire** surface area, including the interior and exterior!!! You can't say the total is emitted by BOTH surfaces! You have just multiplied its power output, from nothing!

If (just for example) the enclosing sphere were very thin, so that the interior area were nearly the same as the exterior, then you would have just nearly DOUBLED the total power output! That is NOT VALID. It violates conservation of energy.

As I stated before: it is YOUR treatment of this experiment that is absolute fantasy. Not only are you creating energy by assuming your exterior temperature of the shell, you compound your error by then creating energy from the vacuum by saying your hollow sphere radiates its total power (W/m^2) power inward AND outward at the same time.

I'm really not sorry to say this after your past behavior, but showing you're wrong is just plain dirt simple. And not JUST wrong, but so ridiculously wrong that I can (and will, believe me!) use it as entertainment for certain of my friends.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-02 12:11 (#47809767)
And if you don't believe that you have to divide the total emission by the total area, then maybe NASA can convince you.

What makes it doubly hilarious (there's that word again), is that you try to factor absorption for EACH surface, interior and exterior, but then just willy-nilly assume that the TOTAL emission is then emitted from each side.
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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-02 13:11 (#47810337)
Let's be very clear, just so we understand each other here:

In your descriptions you keep assuming things rather than calculating them. And some of your assumptions do not appear to be valid. You may have meant something other than how I interpreted your words, but that's why it's pretty damned hard to prove anything without calculating it all the way through.

Further, you have had a strong tendency to use imprecise terms, which causes confusion. For example: power (W) is not the same as irradiance (W/m**2) and they may not be willy-nilly conflated. So why don't you draw a diagram, and simply perform all the calculations? No more beating around the bush, no more introduction of new elements. I'll even go with your own example of the passive plate enclosing the heat source, for now. I consider that to be a pretty major concession that I don't think you deserve.

So, there is a heat source of area X. Go ahead and assume it's a sphere if you like. Like Spencer, we can assume that the electrical power in is constant, and enough to heat the source to 150 deg. F, inside a larger enclosure which is kept (by means of which we need not concern ourselves), at 0 deg. F. We can also assume, like Spencer, that the properties of our materials do not change with temperature.

Then an enclosing plate is introduced, at a temperature (initially) less than that of the source. We can, if you wish, assume it is a hollow sphere, of some reasonable thickness, so the interior and exterior areas differ, and of a smaller external radius than the outside wall, so again they don't touch. Vacuum in between. And we begin our analysis. The starting point and equilibrium are both relevant points that should be calculated.

Since this is supposed to be an approximation of a real-world situation, we should use real materials with real emissivities and absorptivies. Just to keep everybody honest.

I don't insist, but to avoid ambiguity and to make things expressible on a standard keyboard, this is how *I* would label things: S for heat source, so radiative temperature T of S would be T(s). Passive plate (or shell) P. Outside enclosure or wall W. Absorptivity A so absorptivity of P would be A(p). Emissivity E.

Radiant power = (sigma)T**4, where sigma = approx. 5.67 * 10**-8 W/m**2 K**-4
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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-02 13:30 (#47810511)

But let's also be clear about this: even given potential misunderstandings, your prior analysis was still wrong. It is VERY easy to show this.

Presume you have an initial source at T = 150 deg. F. It has a surface area of 1 m**2. Therefore (let's just assume your figure for power output here, it doesn't really matter and it's good enough for this illustration): it's emission is 509W/m**2. Let's say the EXTERIOR of your enclosing shell has an area of 2 m**2.

However, your words (though in a slightly different context): power in = power out. Since the total power (W/m**2 times X m**2) must be the same in as out, the exterior of your shell cannot have the same irradiance. The same must be true if this were just one solid sphere, rather than a hollow sphere enclosing another sphere.

Solving for the Stefan-Boltsmann relation at 509W/m**2 times 1 m**2 is total number of watts. If you try to multiply the same emission rate over 2 m**2 you get a DIFFERENT answer. That's just a fact. By **assuming** an external temperature of 150 deg. F, you have just created tangible energy from the vacuum. Congratulations.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-02 15:09 (#47811491) Homepage Journal

> Electric input of 509 W/m2 is constant and the walls are held at 0F (255K). Therefore, the second plate has to radiate the same power out as the heated plate did before it was enclosed. So energy conservation at equilibrium requires that the second plate be at 150F (339K).

> Utter nonsense. The temperature of the outside of your enclosing sphere is determined entirely by its absorption minus its emission, with absorptivity and emissivity factored in. If your interior heat source were emitting at (your figure) 509W/m^2, and that is being absorbed by the interior surface of your enclosing sphere (which MUST have larger radius than the source, since they can't contact), then your outside surface, being of even larger area, must therefore be colder. ... So you're INVENTING ENERGY OUT OF THIN AIR. ... ***[Jane Q. Public, 2014-09-02]***

I've already showed you that the outer surface of an enclosing shell with an area ratio similar to Earth's warms to ~149.6F. I've explained that neglecting area ratios is a tricycle: a simple approximation that helps us learn. It's like the "frictionless pulley" or "massless rope" or "blackbody" approximations. Again, in this case the tricycle isn't too inaccurate compared to the bicycle, it's much easier to learn, and it provides a sanity check on the more complicated calculation. As the area ratio approaches "1.0" the bicycle should give the same answer as the simpler tricycle. And it does.

> ... your prior analysis was still wrong. It is VERY easy to show this. Presume you have an initial source at T = 150 deg. F. It has a surface area of 1 m**2. Therefore (let's just assume your figure for power output here, it doesn't really matter and it's good enough for this illustration): it's emission is 509W/m**2. Let's say the EXTERIOR of your enclosing shell has an area of 2 m**2. However, your words (though in a slightly different context): power in = power out. Since the total power (W/m**2 times X m**2) must be the same in as out, the exterior of your shell cannot have the same irradiance. The same must be true if this were just one solid sphere, rather than a hollow sphere enclosing another sphere. Solving for the Stefan-Boltsmann relation at 509W/m**2 times 1 m**2 is total number of watts. If you try to multiply the same emission rate over 2 m**2 you get a DIFFERENT answer. That's just a fact. By **assuming** an external temperature of 150 deg. F, you have just created tangible energy from the vacuum. Congratulations. ***[Jane Q. Public, 2014-09-02]***

When the area ratio departs far from 1.0, the tricycle becomes very inaccurate, so one should use the more complicated bicycle. But again, the Earth's area ratio is roughly 1.0025, so in that case the tricycle isn't too inaccurate.

Once again, I've already accounted for the area ratio to obtain the more complicated and more accurate solution.

> But the second plate also radiates the same power in, toward the enclosed heated plate. Just like the cold chamber walls do. Now consider conservation of energy just inside the second plate (but outside the first) at equilibrium. We can solve for the insulated heated plate's temperature using Eq. 1 by setting Tc = 150F (339K). That yields an insulated heated plate temperature of 235F (386K).

> **No, it doesn't!** The irradiation is total for the entire hollow sphere, not for each surface. You have to divide the total irradiance by the **entire** surface area, including the interior and exterior!!! You can't say the total is emitted by BOTH surfaces! You have just multiplied its power output, from nothing! If (just for example) the enclosing sphere were very thin, so that the interior area were nearly the same as the exterior, then you would have just nearly DOUBLED the total power output! That is NOT VALID. It violates conservation of energy. ... Not only are you creating energy by assuming your exterior temperature of the shell, you compound your error by then creating energy from the vacuum by saying your hollow sphere radiates its total power (W/m^2) power inward AND outward at the same time. ***[Jane Q. Public, 2014-09-02]***

No. Conservation of energy at equilibrium requires that irradiance in = irradiance out through any boundary. Because I started with that equation, my solutions obey conservation of energy. Consider Eq. 1:

electricity + sigma*T_c^4 = sigma*T_h^4 (Eq. 1)

Place the boundary between the enclosing shell and the chamber walls. Since electricity is constant and T_c = 0F, conservation of energy at equilibrium requires that T_h (the enclosing shell's outer surface temperature) be ~149.6F (because its area is 1.0025 times larger than the heated plate's).

> ... you have to divide the total emission by the total area... What makes it doubly hilarious (there's that word again), is that you try to factor absorption for EACH surface, interior and exterior, but then just willy-nilly assume that the TOTAL emission is then emitted from each side. ***[Jane Q. Public, 2014-09-02]***

Conservation of energy at equilibrium forces the enclosing shell's outer surface to radiate the same 509 W/m^2 out that the heated plate did before it was enclosed. If this irradiance described the total being emitted by the inner and outer surfaces, the enclosing shell wouldn't be radiating 509 W/m^2 out to the chamber walls. That would mean irradiance in > irradiance out, which means the enclosing shell would warm until its total irradiance out is 509 W/m^2.

> And if you don't believe that you have to divide the total emission by the total area, then maybe NASA can convince you. ... ***[Jane Q. Public, 2014-09-02]***

No, you linked to another PSI Sky Dragon Slayer.

> ... it's pretty damned hard to prove anything without calculating it all the way through. ... So why don't you draw a diagram, and simply perform all the calculations? ... I'll even go with your own example of the passive plate enclosing the heat source, for now. ... Then an enclosing plate is introduced, at a temperature (initially) less than that of the source. We can, if you wish, assume it is a hollow sphere, of some reasonable thickness, so the interior and exterior areas differ, and of a smaller external radius than the outside wall, so again they don't touch. Vacuum in between. And we begin our analysis. The starting point and equilibrium are both relevant points that should be calculated. ... ***[Jane Q. Public, 2014-09-02]***

I've performed all those calculations here. The dimensions are all specified here, and the starting points and equilibrium temperatures have all been calculated. I've shared my work in an open-source Sage worksheet. But if you'd like, I can spend some time formatting the Sage worksheet and post it here so you can use a calculator, or copy

and paste it directly into the online Sage calculator.

> ... Since this is supposed to be an approximation of a real-world situation, we should use real materials with real emissivities and absorptivies. Just to keep everybody honest. ... ***[Jane Q. Public, 2014-09-02]***

I used aluminum's emissivity, absorptivity and thermal conductivity. That required using MIT's equation for graybody heat transfer, which I wrote using my variable names as Eq. 2 here (using LaTeX) and here (using ugly HTML).

> ... I don't insist, but to avoid ambiguity and to make things expressible on a standard keyboard, this is how *I* would label things: S for heat source, so radiative temperature T of S would be T(s). Passive plate (or shell) P. Outside enclosure or wall W. Absorptivity A so absorptivity of P would be A(p). Emissivity E. ... ***[Jane Q. Public, 2014-09-02]***

Here's my Eq. 2 using your variable names:

net heat flow = sigma*(T(s)^4 - T(w)^4)/(1/E(s) + 1/E(w) - 1) (Eq. 2J)

Note that it reduces to my simpler blackbody Eq. 1 if E(s) = E(w) = 1.

If you'd like me to clarify what my variable names for a particular equation would be in your terminology, just ask.

I've specified the dimensions. The heated plate is a sphere with radius 6371 mm and surface area A_h. The enclosing plate is a 1 mm thick concentric shell with an inner radius of 6378 mm, surface area A_c1 on the inside, and A_c2 on the outside. The chamber is also a concentric sphere with inner radius 6386 mm, so there's a 7 mm gap on both sides of the enclosing shell. Again, the plates and walls are oxidized aluminum.

At equilibrium, net heat flow out (in W/m^2) equals "electricity". The first step is to calculate that constant variable "electricity" which describes electrical power per square meter heating the sphere to 150F without an enclosing shell. I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches equilibrium.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-02 15:54 (#47811955)

I've already showed you that the outer surface of an enclosing shell with an area ratio similar to Earth's warms to ~149.6F. I've explained that neglecting area ratios is a tricycle: a simple approximation that helps us learn. It's like the "frictionless pulley" or "massless rope" or "blackbody" approximations. Again, in this case the tricycle isn't too inaccurate compared to the bicycle, it's much easier to learn, and it provides a sanity check on the more complicated calculation. As the area ratio approaches "1.0" the bicycle should give the same answer as the simpler tricycle. And it does.

Bullshit. I quoted your exact words above. You don't get to plug later calculations back into your original erroneous analysis and call it good. And I have already explained why it is not possible to do this and still get valid answers. 2 * X is not the same as 1 * X. It is not valid to multiply your power output with no further power input. It's a violation of conservation of energy. So you're still falling off your tricycle.

Repeat: if we give the sphere which is the heat source, at 150 deg. F, an area of 1 m**2, and the outer area of the enclosing sphere an area of 2 m**2, and (as YOU have said), power in = power out, then the exterior surface cannot be the same temperature. This is not even advanced physics, it's simple damned algebra.

And even Spencer did not assume net heat transfer from the exterior walls, which is

fine because the exterior walls cannot be of greater temperature so according to the S-B law there is no net heat transfer to the interior objects. T(w)
All else being equal, the amount of power input necessary to heat an object with 1 m**2 surface to 150 deg. F is not enough to heat an object of similar material with 2m**2 surface area to the same temperature! If you try to assume the same radiative temperature over greater area, you must have greater input, or else you have done your math badly. I have stated this to you a number of times. Your attempt at analyzing this challenge violates conservation of energy. Period. This is unequivocal.

And no, it's not like the blackbody approximations because we're talking about real objects here, so emissivity will not be same as absorptivity, BUT that's really irrelevant to this particular point. You're just clownishly hand-waving again, because even if they were black bodies, they would still have to obey S-B and you would still be wrong.

I quoted your actual analysis above, which you wrote some time ago and claimed it was a refutation of Latour. Your math is wrong. Further, it is not valid to take other calculations you did later, using different assumptions, plug them back into the original problem and claim that all is good. If you want to change your figures, then START OVER AND DO IT RIGHT. It isn't valid to make other assumptions then just plug those calculations back into the original problem as though that made no difference.

You are only illustrating why I have said all along that you're full of bull, and you have been all along. **Either you are incapable of doing this properly, or you're just bullshitting everybody for reasons of your own.** And as I have stated before, I believe it is your own strange way of further harassing me.

No, you linked to another PSI Sky Dragon Slayer.

Hahahahaha! Now, THIS is ad-hominem at its finest. I did write NASA when I meant ESA, but that is beside the point. It is the information content you must refute, not the person, and the information is clear: the chart (straight from ESA) contains a 0.5 factor because a plate has 2 sides, and you have to calculate emittance from BOTH sides. No matter what the shape of your object, you have to calculate emittance from ALL its surfaces if you want to get the correct answer for temperature. You don't get to take the total emittance and multiply it, which you implied in the analysis I quoted.

If you can do it better NOW, then do it better. Don't just take chunks from explanation A and toss them in with chunks of explanation B and call that a thorough treatment of the problem, because that's just more bullshit.

I have shown you unequivocally to be wrong, via simple algebra. If you can analyze the challenge properly, then do it properly, from beginning to end. No more prevaricating, no more bullshit.

So far you have failed to do so. Given your claim that you're going to devote your time to proving me wrong, then prove me wrong if you can. So far you have not even come close. And of course you still won't, because you're not capable.

At equilibrium, net heat flow out (in W/m^2) equals "electricity".

Fine. So, if (as in the statement you made that **I quoted above**), you say the outside of the passive sphere is the same temperature as the heat source (as you did), then your output power is a multiple of the input power. PLUS in your calculation of temperature you omitted the radiance of the interior surface, which you may not do.

You are creating energy from nowhere. You don't get to do that, if you don't want me to keep calling you (and showing you to others to be) nothing more than a clown.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-02 16:04 (#47812063) Homepage Journal

Obviously we'll have to agree to disagree. But I thought you wanted to do some actual

calculations? As you say, it's pretty damned hard to prove anything without calculating it all the way through. So why don't we take the first step?

> ... it's pretty damned hard to prove anything without calculating it all the way through. ... So why don't you draw a diagram, and simply perform all the calculations? ... I'll even go with your own example of the passive plate enclosing the heat source, for now. ... Then an enclosing plate is introduced, at a temperature (initially) less than that of the source. We can, if you wish, assume it is a hollow sphere, of some reasonable thickness, so the interior and exterior areas differ, and of a smaller external radius than the outside wall, so again they don't touch. Vacuum in between. And we begin our analysis. The starting point and equilibrium are both relevant points that should be calculated. ... I don't insist, but to avoid ambiguity and to make things expressible on a standard keyboard, this is how *I* would label things: S for heat source, so radiative temperature T of S would be T(s). Passive plate (or shell) P. Outside enclosure or wall W. Absorptivity A so absorptivity of P would be A(p). Emissivity E. ... ***[Jane Q. Public, 2014-09-02]***

Here's my Eq. 2 using your variable names:

net heat flow = sigma*(T(s)^4 - T(w)^4)/(1/E(s) + 1/E(w) - 1) (Eq. 2J)

Note that it reduces to my simpler blackbody Eq. 1 if E(s) = E(w) = 1.

If you'd like me to clarify what my variable names for a particular equation would be in your terminology, just ask.

I've specified the dimensions. The heated plate is a sphere with radius 6371 mm and surface area A_h. The enclosing plate is a 1 mm thick concentric shell with an inner radius of 6378 mm, surface area A_c1 on the inside, and A_c2 on the outside. The chamber is also a concentric sphere with inner radius 6386 mm, so there's a 7 mm gap on both sides of the enclosing shell. Again, the plates and walls are oxidized aluminum.

At equilibrium, net heat flow out (in W/m^2) equals "electricity". The first step is to calculate that constant variable "electricity" which describes electrical power per square meter heating the sphere to 150F without an enclosing shell. I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches equilibrium.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-02 16:24 (#47812251)

I've already showed you that the outer surface of an enclosing shell with an area ratio similar to Earth's warms to ~149.6F. I've explained that neglecting area ratios is a tricycle: a simple approximation that helps us learn. It's like the "frictionless pulley" or "massless rope" or "blackbody" approximations. Again, in this case the tricycle isn't too inaccurate compared to the bicycle, it's much easier to learn, and it provides a sanity check on the more complicated calculation. As the area ratio approaches "1.0" the bicycle should give the same answer as the simpler tricycle. And it does.

Bullshit. I quoted your exact words above. You don't get to plug later calculations back into your original erroneous analysis and call it good. And I have already explained why it is not possible to do this and still get valid answers. 2 * X is not the same as 1 * X. It is not valid to multiply your power output with no further power input. It's a violation of conservation of energy. So you're still falling off your tricycle.

Repeat: if we give the sphere which is the heat source, at 150 deg. F, an area of 1 m**2, and the outer area of the enclosing sphere an area of 2 m**2, and (as YOU have said), power in = power out, then the exterior surface cannot be the same

temperature. This is not even advanced physics, it's simple damned algebra.

And even Spencer did not assume net heat transfer from the exterior walls, which is fine because the exterior walls cannot be of greater temperature so according to the S-B law there is no net heat transfer to the interior objects. T(w)
All else being equal, the amount of power input necessary to heat an object with 1 m**2 surface to 150 deg. F is not enough to heat an object of similar material with 2m**2 surface area to the same temperature! If you try to assume the same radiative temperature over greater area, you must have greater input, or else you have done your math badly. I have stated this to you a number of times. Your attempt at analyzing this challenge violates conservation of energy. Period. This is unequivocal.

And no, it's not like the blackbody approximations because we're talking about real objects here, so emissivity will not be same as absorptivity, BUT that's really irrelevant to this particular point. You're just clownishly hand-waving again, because even if they were black bodies, they would still have to obey S-B and you would still be wrong.

I quoted your actual analysis above, which you wrote some time ago and claimed it was a refutation of Latour. Your math is wrong. Further, it is not valid to take other calculations you did later, using different assumptions, plug them back into the original problem and claim that all is good. If you want to change your figures, then START OVER AND DO IT RIGHT. It isn't valid to make other assumptions then just plug those calculations back into the original problem as though that made no difference.

You are only illustrating why I have said all along that you're full of bull, and you have been all along. **Either you are incapable of doing this properly, or you're just bullshitting everybody for reasons of your own.** And as I have stated before, I believe it is your own strange way of further harassing me.

No, you linked to another PSI Sky Dragon Slayer.

Hahahahaha! Now, THIS is ad-hominem at its finest. I did write NASA when I meant ESA, but that is beside the point. It is the information content you must refute, not the person, and the information is clear: the chart (straight from ESA) contains a 0.5 factor because a plate has 2 sides, and you have to calculate emittance from BOTH sides. No matter what the shape of your object, you have to calculate emittance from ALL its surfaces if you want to get the correct answer for temperature. You don't get to take the total emittance and multiply it, which you implied in the analysis I quoted.

If you can do it better NOW, then do it better. Don't just take chunks from explanation A and toss them in with chunks of explanation B and call that a thorough treatment of the problem, because that's just more bullshit.

I have shown you unequivocally to be wrong, via simple algebra. If you can analyze the challenge properly, then do it properly, from beginning to end. No more prevaricating, no more bullshit.

So far you have failed to do so. Given your claim that you're going to devote your time to proving me wrong, then prove me wrong if you can. So far you have not even come close. And of course you still won't, because you're not capable.

At equilibrium, net heat flow out (in W/m^2) equals "electricity".

In an ideal circumstance with no losses. So, if (as in the statement you made **that I quoted above**), you say the outside of the passive sphere is the same temperature as the heat source (as you did), then your output power is a multiple of the input power. PLUS in your calculation of temperature you omitted the radiance of the interior surface, which you may not do.

It isn't even close to the same temperature, because (simple algebra again) it is easy to show that the total surface area (interior + exterior) of the enclosing plate must be AT LEAST twice the surface area of the spherical heat source.

I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.

Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this.

But I repeat: if we use a ballpark figure like the one you quoted earlier, 509W/m^2 at the surface of the heat source, and call that area 1 m^2, then the emittance at the exterior of the passive plate must be LESS THAN half this figure, because you have the same power spread over more than twice the surface area. But this is not what you actually claimed in the "analysis" I quoted, which is on your website. You claimed that at equilibrium the temperature of the outside of the passive plate would be THE SAME as at the surface of the heat source, or 150 deg. F.

But the total power output (your words) must be the same. The total radiant power emitted by 509 W/m^2 times 1 m^2 equals 509 Watts. (This is power.) The total power output of a surface at 509 W/m^2 times more than 2 m^2 is more than 1018 Watts. So you have contradicted yourself and "created" power from nowhere.

I am busy so I am not going to sit down and calculate the actual radiant temperature of using these figures right now. I shall later, or maybe tomorrow. Including realistic emissivities and absorptivities.

You don't get to do that, if you don't want me to keep calling you (and showing you to others to be) nothing more than a clown.

If your original "analysis" (which you have continued to reference as recently as yesterday) is wrong (it is), then show us a better one. Stop taking shortcuts, and just do it. Or shut up, because up to this point you have demonstrated yourself to be just plain wrong.

I will not accept calculations in some format that is not easily readable on the web. I'm not going to bother to read them and neither will anybody else. This isn't your office, it's Slashdot.

YOU are the one who claimed Latour was wrong. Two years now, I'm still waiting for you to prove it without violating any physical laws.

I might even use your dimensions. I'm not sure yet.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-02 16:27 (#47812275)
Crap. The above, where it says T(w), should have been:

T(w) [is less than] T(p) [is less than] T(s).

Yes, I know Slashdot character handling is a pain in the ass, and it catches me often too, when I try to express "greater than" or "less than". Even so, I'm not installing Sage right now. Better things to do. I have reasons for wanting it public-readable, and I will accept nothing else.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-02 16:42 (#47812401) Homepage Journal

> I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.

Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are.

> I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. ***[Jane Q. Public, 2014-09-02]***

#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()

ANSWER: 29.3986743761843

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches equilibrium. I promise to provide public-readable versions of my Sage worksheet from now on.

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- **Jane/Lonny Eachus goes Sky Dragon Slayer** (Score:2)

by khayman80 (824400) on 2014-09-02 16:46 (#47812457) Homepage Journal

> Slashdot character handling is a pain in the ass, and it catches me often too, when I try to express "greater than" or "less than".

HTML characters "& gt;" for "greater than" and "& lt;" for "less than" (without the spaces).

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer** (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-02 22:26 (#47814261)
I tried those before here a long time ago and it didn't work. But maybe they changed things. So here's another try.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer** (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-02 22:54 (#47814331)
Well, I'll be darned. It works now. I'll see if others are working now too. Like
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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer** (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-02 22:57 (#47814339)
I had reasons for choosing the variable names that I chose. I am well aware that they are not according to convention. But for just one factor out of several, neither is

Slashdot's character handling. Again, just for one example, I used capital E for emissivity rather than epsilon because it shows up well here. And rather than using upper- and lower-case characters for one body vs another, for example, an upper-case letter with subscript() works just fine. I have a couple of other reasons as well, I didn't just say this arbitrarily. At least this way when you refer to what you call the "heated plate" I know which one you mean without ambiguity.

Regardless, you are already skipping ahead. What do you want to use for material? We might as well use the same material throughout. So if you want to use aluminum for source, passive plate, and walls that is fine with me.

We know then, from ESA that the emissivity of aluminum in vacuum is approximately 0.15, and absorptivity 0.05.

I have been too busy to work through this this evening. I'll return tomorrow, if I'm not still too busy. I haven't even looked at your other posts.
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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-02 22:58 (#47814343)
Nope. That one did not work.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-02 23:13 (#47814393) Homepage Journal

> ... What do you want to use for material? We might as well use the same material throughout. So if you want to use aluminum for source, passive plate, and walls that is fine with me. We know then, from ESA that the emissivity of aluminum in vacuum is approximately 0.15, and absorptivity 0.05. ***[Jane Q. Public, 2014-09-02]***

Again, the materials are oxidized aluminum with emissivity = 0.11 for these temperatures. As you said, the best we can realistically do is graybodies where emissivity = absorptivity. If you'd like to use a different emissivity just let me know, and we can both independently calculate the required electricity to check each other's answers.

> > I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.
>
> Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. ***[Jane Q. Public, 2014-09-02]***

#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()

ANSWER: 29.3986743761843

Can we agree on that? If so, we can move on to the next step, which is calculating the

final outer surface temperature of the enclosing shell once it reaches equilibrium. I promise to provide public-readable versions of my Sage worksheet from now on.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-03 0:15 (#47814565)

As you said, the best we can realistically do is graybodies where emissivity = absorptivity. If you'd like to use a different emissivity just let me know, and we can both independently calculate the required electricity to check each other's answers.

After considering the situation I changed my mind. Since we are discussion what is supposed to be a real model of a real situation, we can use real emissivity and absorptivity. And the emissivity of aluminum (as you pointed out yourself some time ago) is different from the absorptivity by a factor of about 3. The ESA figures are observed figures for aluminum plates in near-vacuum, so those figures would appear to be perfect.

And as I stated before, I am busy and I don't have time to figure out your nomenclature right now. That's why I wanted to agree on one.

I do have one more comment I want to make tonight, though. I will reply to the relevant post of yours. It is pointless to continue 3 separate threads at once.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-03 0:23 (#47814585)

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches equilibrium. I promise to provide public-readable versions of my Sage worksheet from now on.

This is one of the whole problems with your analysis. THERE IS NO THERMODYNAMIC EQUILIBRIUM IN THIS EXPERIMENT. There is a steady-state, but no actual equilibrium. That is not possible, because we are actively pumping heat in at one "end", and pumping it out of the other.

Since one of the requirements of thermodynamic equilibrium is that all surfaces be at the same temperature, it will never be achieved because the experiment **requires** that the outside wall be maintained at 0 deg. F, yet we are still pumping significant heat in to the center.

Therefore Kircchoff's law does not apply to this experiment, and no situation arises in which the temperatures are the same everywhere, or the emissivities vs absorptivities. There is a steady-state arising from active (but constant) exchange. But there is no equilibrium.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-03 0:27 (#47814599)

Earlier, when I saw your mentions of equilibrium, I thought you were referring to the steady-state that would eventually be achieved. But even though you mentioned Kircchoff's law, it didn't sink in to my brain that you were referring to actual, literal equilibrium.

Uh-uh. As they say in my neck of the woods: it ain't happenin'.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-03 1:13 (#47814759) Homepage Journal

> As you said, the best we can realistically do is graybodies where emissivity = absorptivity. If you'd like to use a different emissivity just let me know, and we can both independently calculate the required electricity to check each other's answers.

> After considering the situation I changed my mind. Since we are discussion what is supposed to be a real model of a real situation, we can use real emissivity and absorptivity. ... ***[Jane Q. Public, 2014-09-02]***

You were right when you said the best we can realistically do is graybodies where emissivity = absorptivity. Otherwise we'd need to derive a new equation where heat transfer is an integral over wavelengths. In other words, we'd have to recreate MODTRAN. I simply don't have time for that.

> After considering the situation I changed my mind. Since we are discussion what is supposed to be a real model of a real situation, we can use real emissivity and absorptivity. And the emissivity of aluminum (as you pointed out yourself some time ago) is different from the absorptivity by a factor of about 3. The ESA figures are observed figures for aluminum plates in near-vacuum, so those figures would appear to be perfect. ***[Jane Q. Public, 2014-09-02]***

I've never pointed that out. I've repeatedly shown you Goodman 1957 where Table 1 lists aluminum's emissivity as 0.113 from 100C to 300C.

In contrast, you're citing ESA figures from page 32 which are at 0K (-273C). But nothing in this experiment is anywhere near that cold.

Also note that Goodman 1957 specifically tests the gray body approximation and concludes that *"Pure aluminum appears to act like a gray body when its radiating surfaces are at temperatures lower than 400C."*

Again, if you'd like to use a different emissivity just let me know, and we can both independently calculate the required electricity to check each other's answers.

> THERE IS NO THERMODYNAMIC EQUILIBRIUM IN THIS EXPERIMENT. There is a steady-state, but no actual equilibrium. That is not possible, because we are actively pumping heat in at one "end", and pumping it out of the other. Since one of the requirements of thermodynamic equilibrium is that all surfaces be at the same temperature ... ***[Jane Q. Public, 2014-09-02]***

We might be talking past each other. What you're calling steady-state is what I'm calling equilibrium. Radiative thermodynamic equilibrium doesn't require all surfaces to be at the same temperature, it simply means that temperatures don't change with time. At radiative equilibrium, power in = power out, which also means irradiance in = irradiance out.

> ... Kircchoff's law does not apply to this experiment, and no situation arises in which the temperatures are the same everywhere, or the emissivities vs absorptivities. There is a steady-state arising from active (but constant) exchange. But there is no equilibrium. ***[Jane Q. Public, 2014-09-02]***

> Earlier, when I saw your mentions of equilibrium, I thought you were referring to the steady-state that would eventually be achieved. But even though you mentioned Kircchoff's law, it didn't sink in to my brain that you were referring to actual, literal equilibrium. Uh-uh. As they say in my neck of the woods: it ain't happenin'. ***[Jane Q. Public, 2014-09-02]***

I've already shown that MIT used Kirchhoff's law to derive heat transfer between gray bodies. I've already shown that Goodman 1957 tested the gray body approximation (Kirchhoff's law) and found that it's valid for aluminum at the temperatures in this experiment.

Note that my definition of equilibrium is consistent with this one: *"In physics, radiative equilibrium is the condition where a steady state system is in dynamic equilibrium, with equal incoming and outgoing radiative heat flux and negligible heat transfer by conduction and convection."*

In other words, irradiance in = irradiance out at radiative thermodynamic equilibrium. We're just using different words to describe the same concept.

> I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.

> Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. ***[Jane Q. Public, 2014-09-02]***

```
#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()
```

ANSWER: 29.3986743761843

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches equilibrium (aka Jane's "steady-state").

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-03 10:52 (#47818457)

In contrast, you're citing ESA figures from page 32 which are at 0K (-273C). But nothing in this experiment is anywhere near that cold.

Nonsense. They are figures at at incident radiation of 1367 W/m^2, which is sunlight at 1 AU, for the very reason that it is an approximation of Earth insolation. So in fact it would make a good representative example of what Spencer's model is supposed to be all about. Or do you (like Spencer) claim that space is "cold"?

But since you want to try to mischaracterize everything I say, and pick it all apart for reasons of your own, have it your own way. This is simply not very important.

You were right when you said [slashdot.org] the best we can realistically do is graybodies where emissivity = absorptivity. Otherwise we'd need to derive a new equation where heat transfer is an integral over wavelengths. In other words, we'd have to recreate MODTRAN [wikipedia.org]. I simply don't have time for that.

As I mentioned before, ESA gives observed values for integrated emissivity and

absorptivity for aluminum. This is a good approximation and it is used in the real world for aluminum in a vacuum. If you really insist on gray bodies that's up to you; but I do not acknowledge that there is any legitimate reason to NOT use reasonable approximations of integrated absorptivity and emissivity.

We might be talking past each other. What you're calling steady-state is what I'm calling equilibrium. Radiative thermodynamic equilibrium doesn't require all surfaces to be at the same temperature, it simply means that temperatures don't change with time. At radiative equilibrium, power in = power out, which also means irradiance in = irradiance out.

You USED this before to ASSUME all surfaces were at the same temperature! I quoted you saying it in a post above, and you referenced that passage just the other day. In fact this was the source of much of the misunderstanding here. I did not understand why you were assuming some of the things you were assuming, and so my conclusion was that you were just messing with me. (And I am still not convinced that you were not.) THERE IS NO RADIATIVE EQUILIBRIUM HERE. THERE IS NO THERMAL EQUILIBRIUM HERE. None. You may not assume them.

I've already shown that MIT used Kirchhoff's law to derive heat transfer between gray bodies. I've already shown that Goodman 1957 tested the gray body approximation (Kirchhoff's law) and found that it's valid for aluminum at the temperatures in this experiment.

Note that my definition of equilibrium is consistent with this one: "In physics, radiative equilibrium is the condition where a steady state system is in dynamic equilibrium, with equal incoming and outgoing radiative heat flux and negligible heat transfer by conduction and convection."

In other words, irradiance in = irradiance out at radiative thermodynamic equilibrium. We're just using different words to describe the same concept.

No, we aren't, and you are incorrect. Actual thermodynamic equilibrium DOES require that there is no radiative transfer, and you aren't going to get it both ways. A steady-state is NOT the same thing as equilibrium. In Spencer's challenge, thermodynamic equilibrium does not exist. Radiative equilibrium does not exist. At no time are ANY of the surfaces in this experiment at the same temperature, and there is constant radiative transfer between bodies. This is another example of how you have played fast-and-loose with terminology. You do not get to re-define equilibrium any way you choose. Just no.

Kircchoff's law (and MIT's example) both assume no bodies involved are storing thermal energy, and there is **thermal** equilibrium. In fact that is how Kircchoff's law is derived: technically Kircchoff's law only applies at thermal equilibrium. MIT was free to apply it in their example because thermal equilibrium was assumed. However in Spencer's challenge there very definitely is no equilibrium. It is not appropriate to assume it or try to apply it here: the whole point is that we are trying to determine **differing temperatures**. It may not be assumed that the temperatures are the same! As you have done at least once. Nor may radiative equilibrium be assumed, as you did above.

That must be understood before we go further. You don't get to assume conditions that simply don't apply. I don't particularly mind if you want to assume gray bodies. I just wanted to use a more realistic example. Gray bodies can store thermal energy, so that's fine as far as it goes.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-03 10:56 (#47818467)
The long underline was an editing mistake.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-03 12:23 (#47819275) Homepage Journal

> Nonsense. They are figures at at incident radiation of 1367 W/m^2, which is sunlight at 1 AU, for the very reason that it is an approximation of Earth insolation. So in fact it would make a good representative example of what Spencer's model is supposed to be all about. ... ESA gives observed values for integrated emissivity and absorptivity for aluminum. This is a good approximation and it is used in the real world for aluminum in a vacuum. ***[Jane Q. Public, 2014-09-03]***

Those ESA absorptivities are for absorption of sunlight. Consider the first diagram here which shows that 6000K sunlight has much shorter wavelengths than the radiation from objects at the temperatures we're considering. In fact they hardly overlap. But the emissivities are for radiation emitted by much cooler objects. That's one reason why those ESA emissivities aren't equal to their absorptivities.

Here's a good explanation of this problem: *"... white paint is quoted as having an absorptivity of 0.16, while having an emissivity of 0.93.[9] This is because the absorptivity is averaged with weighting for the solar spectrum, while the emissivity is weighted for the emission of the paint itself at normal ambient temperatures. ..."*

> If you really insist on gray bodies that's up to you; but I do not acknowledge that there is any legitimate reason to NOT use reasonable approximations of integrated absorptivity and emissivity. ***[Jane Q. Public, 2014-09-03]***

Since the absorption values you indirectly cited are for absorption from the 6000K radiation from the Sun, that seems like a legitimate reason not to use those values in a thought experiment where nothing is at 6000K. Again, another reason is that we'd have to recreate MODTRAN to derive heat transfer between non-gray bodies where emissivity and absorptivity are arbitrary functions of wavelength.

And once we debugged that new MODTRAN clone, we'd have to test it in a simple case, like the case of gray bodies where emissivity and absorptivity don't depend on wavelength. So we might as well solve the simple problem first.

> > We might be talking past each other. What you're calling steady-state is what I'm calling equilibrium. Radiative thermodynamic equilibrium doesn't require all surfaces to be at the same temperature, it simply means that temperatures don't change with time. At radiative equilibrium, power in = power out, which also means irradiance in = irradiance out.
>
> You USED this before to ASSUME all surfaces were at the same temperature! I quoted you saying it in a post above, and you referenced that passage just the other day. In fact this was the source of much of the misunderstanding here. ... ***[Jane Q. Public, 2014-09-03]***

Once again, I never said that. In reality, I said that both sides of a thermal superconductor are at the same temperature. This was the source of much of the misunderstanding here, and you strongly objected to the notion of a thermal superconductor. Again, that's why I calculated the small temperature difference across an aluminum shell with finite conductivity.

That's also why it's odd that you prefer those ESA figures, because they were derived on page 31 using the assumption that the body is infinitely conductive.

> ... A steady-state is NOT the same thing as equilibrium. ... You do not get to re-define equilibrium any way you choose. Just no. ... ***[Jane Q. Public, 2014-09-03]***

I was using this definition: *"When incoming solar energy is balanced by an equal flow of heat to space, Earth is in radiative equilibrium and global temperatures become relatively stable."*

Note that this definition of equilibrium doesn't require the south pole to be at the same

temperature as the equator, or Earth's surface to be at the same temperature as the tropopause.

> ... THERE IS NO RADIATIVE EQUILIBRIUM HERE. THERE IS NO THERMAL EQUILIBRIUM HERE. None. You may not assume them. ... In Spencer's challenge, thermodynamic equilibrium does not exist. ... in Spencer's challenge there very definitely is no equilibrium. ***[Jane Q. Public, 2014-09-03]***

Dr. Spencer disagrees: *"Eventually the second plate will also reach a state of equilibrium, where its average temperature (let's say 100 deg. F) stays constant with time."*

But from now on I'll call the system in "steady state" when its temperatures don't change with time, in the naive hope that we might actually be able to finally take the very first step in this calculation.

> ... I don't particularly mind if you want to assume gray bodies. I just wanted to use a more realistic example. Gray bodies can store thermal energy, so that's fine as far as it goes. ***[Jane Q. Public, 2014-09-03]***

If you don't particularly mind, could we finally take the very first step in this calculation? Please?

> > I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.
>
> Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. ***[Jane Q. Public, 2014-09-02]***

```
#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()
```

ANSWER: 29.3986743761843

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches Jane's "steady-state".

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-03 19:23 (#47822415)

Those ESA absorptivities are for absorption of sunlight. Consider the first diagram here which shows that 6000K sunlight has much shorter wavelengths than the radiation from objects at the temperatures we're considering. In fact they hardly overlap. But the emissivities are for radiation emitted by much cooler objects. That's one reason why those ESA emissivities aren't equal to their absorptivities.

I repeat that these are under conditions of Earth-absorptive-surface insolation, which was what Spencer's experiment was supposed to emulate. But whatever.

But the emissivities are for radiation emitted by much cooler objects.

No, they are not. They are reported for the previously stated conditions: 1367 W/m^2

in incident radiation. But again: whatever. I already stated that this is not important enough to argue the point. I'm not conceding your point, but I'm willing to move on with gray bodies.

Once again, I never said that. In reality, I said that both sides of a thermal superconductor are at the same temperature. This was the source of much of the misunderstanding here, and you strongly objected to the notion of a thermal superconductor. Again, that's why I calculated the small temperature difference across an aluminum shell with finite conductivity.

Yes, you did say that, and anybody who wants to can read it on your website. And you wrote it BEFORE any discussion with me of "thermal superconductors". I will quote it again here:

Electric input of 509 W/m2 is constant and the walls are held at 0ÃF (255K). Therefore, the second plate has to radiate the same power out as the heated plate did before it was enclosed. So energy conservation at equilibrium requires that the second plate be at 150ÃF (339K).

You were referring to "the second plate", as opposed to the "heated plate". That corresponds to what I have been calling the "passive" or "enclosing" plate. And you further referred to a supposed thermal equilibrium that doesn't exist.

Which fantasy would you prefer we believe? A thermal superconductor that makes no sense in this context, or an equilibrium which does not exist in this context? And you don't have the excuse that you meant "steady state", because the figure you gave would only be appropriate for actual equilibrium.

But enough of old arguments. Let's move on.

I was using this definition: "When incoming solar energy is balanced by an equal flow of heat to space, Earth is in radiative equilibrium and global temperatures become relatively stable."

Great. Except that it doesn't pertain to Spencer's challenge for several reasons. First, the chamber walls in Spencer's experiment are not "empty" space, but a material body that is being actively refrigerated, while the "enclosing passive plate" is being heated on the other side. So that plate is not in radiative equilibrium with the chamber wall or with anything else for that matter. In fact that would be impossible. There are other reasons why that description does not match Spencer's challenge, but that is irrelevant for now. One is enough.

Dr. Spencer disagrees: "Eventually the second plate will also reach a state of equilibrium, where its average temperature (letâ(TM)s say 100 deg. F) stays constant with time."

It is unfortunate that Spencer plays almost as fast-and-loose with terms as you do. That is a steady state. It is NOT "equilibrium". They are different things.

If you don't particularly mind, could we finally take the very first step in this calculation? Please?

Yes, I mind very much. There is no point in doing any calculations at all until we rid you of the false assumptions you have been making about this experiment (as I have been trying to do). They have been leading to incorrect results, and moving on would be a waste of everybody's time. Further, you can take out the epsilons, since I thought we had already agreed we don't need them. (If they represent emissivity.)

There is no equilibrium in this experiment, either thermal or radiative. Period. You may not assume them, or use formulas that are only appropriate for equilibrium. Get past that and move on, or stay stuck here. That's up to you. But unless and until you do, there is simply no need for me to go any further. Your refutation to this point has been demonstrated to be invalid.

Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-03 19:42 (#47822507)
Thermodynamic equilibrium is when every object is in thermal and radiative equilibrium as its surroundings.

Not a single object in Spencer's described challenge -- at any time -- meets these criteria. When everything is in thermal equilibrium -- as you have noted -- they are all at the same temperature. That never happens here.

The passive plate MAY be said to reach **radiative** equilibrium at some point... I stated that incorrectly before, and I apologize for doing so. I'm correcting it here so we don't have any misunderstandings.

There is no thermal equilibrium. Period. None. There MAY (and eventually would) arise a condition of **radiative** equilibrium for the (enclosing, passive, however you want to describe it) plate. But the other objects (heat source and chamber walls) do not meet this criteria because they are heated/cooled by means that may be other than radiative. "The system" is not in radiative equilibrium.

Without thermal equilibrium (which unequivocally does not occur here), Kircchoff's law does not apply, except perhaps in coincidental specific cases. It may not be assumed.
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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-03 20:23 (#47822701)
To be even more clear, because I want to eliminate all misunderstands, this statement that I made above is incorrect:

Great. Except that it doesn't pertain to Spencer's challenge for several reasons. First, the chamber walls in Spencer's experiment are not "empty" space, but a material body that is being actively refrigerated, while the "enclosing passive plate" is being heated on the other side. So that plate is not in radiative equilibrium with the chamber wall or with anything else for that matter. In fact that would be impossible. There are other reasons why that description does not match Spencer's challenge, but that is irrelevant for now. One is enough.

Mea culpa. The outside of the enclosing passive plate **would** eventually reach radiative equilibrium with the chamber walls. But not thermal equilibrium. Further, the inside of the passive heated plate would reach radiative equilibrium with the heat source. But not thermal equilibrium in that case either. Nor, for that matter, is that same plate in thermal equilibrium even with itself, since realistically its inside and outside surfaces must be at different temperatures, in order to be at radiative equilibrium with those opposing surfaces.

Because I was incorrect to state that there is no radiative equilibrium, I was incorrect to state that a roughly analogous situation does not apply to Spencer's experiment. The opposing surfaces do reach radiative equilibrium. But it is still not very relevant here, because thermal (and therefore thermodynamic) equilibrium still does not exist.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-03 20:31 (#47822713)
Meh. It seems there is no end to clarifying. But it is also simplifying, in a sense, because it is eliminating irrelevant sidetracks:

I can conceive of a situation in which an enclosing, passive plate, of specific dimensions, **might** manage to be the same temperature on the inside and the outside in these circumstances. But I'm not going to bother getting sidetracked trying to do the calculations to either prove it or disprove it, because if it ever arose at all it would be a very rare special case, and whether it does or not is irrelevant to the central point.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-03 20:59 (#47822789) Homepage Journal

> You USED this before to ASSUME all surfaces were at the same temperature! I quoted you saying it in a post above, and you referenced that passage just the other day. In fact this was the source of much of the misunderstanding here. ... ***[Jane Q. Public, 2014-09-03]***
>
> Once again, I never said that. In reality, I said that both sides of a thermal superconductor are at the same temperature. This was the source of much of the misunderstanding here, and you strongly objected to the notion of a thermal superconductor. Again, that's why I calculated the small temperature difference across an aluminum shell with finite conductivity. ***[Dumb Scientist]***

Yes, you did say that, and anybody who wants to can read it on your website. And you wrote it BEFORE any discussion with me of "thermal superconductors". I will quote it again here:

> Electric input of 509 W/m^2 is constant and the walls are held at 0F (255K). Therefore, the second plate has to radiate the same power out as the heated plate did before it was enclosed. So energy conservation at equilibrium requires that the second plate be at 150F (339K).

You were referring to "the second plate", as opposed to the "heated plate". That corresponds to what I have been calling the "passive" or "enclosing" plate. ... ***[Jane Q. Public, 2014-09-03]***

Once again, no. I never said that all surfaces were at the same temperature. I've already explained that the **final** outer temperature of the enclosing shell doesn't happen at the same time as the **initial** temperature of the heated plate. **Initially**, the heated plate is at 150F and the enclosing shell is cooler than 100F. But because power in > power out, the plates slowly warm to a new steady-state. By the time the outer temperature of the enclosing shell is ~149.6F (accounting for area differences), the heated plate is ~233.8F. This doesn't change even if we neglect area differences: the enclosing shell and the heated plate are never at the same temperature. Again, that's why I called them T_c and T_h.

So once again, I never said that all surfaces were at the same temperature.

> If you don't particularly mind, could we finally take the very first step in this calculation? Please?

Yes, I mind very much. There is no point in doing any calculations at all until we rid you of the false assumptions you have been making about this experiment (as I have been trying to do). They have been leading to incorrect results, and moving on would be a waste of everybody's time. ... There is no equilibrium in this experiment, either thermal or radiative. Period. You may not assume them, or use formulas that are only appropriate for equilibrium. Get past that and move on, or stay stuck here. That's up to you. But unless and until you do, there is simply no need for me to go any further. Your refutation to this point has been demonstrated to be invalid. ***[Jane Q. Public, 2014-09-03]***

I'm very sorry. I take full responsibility. Can we please move on?

> ... you can take out the epsilons, since I thought we had already agreed we don't need them. (If they represent emissivity.) ... ***[Jane Q. Public, 2014-09-03]***

Huh? Of **course** we need the emissivities to model gray body heat transfer. If you'd like to solve the simpler problem of black body plates, then we can set the emissivities to 1, but I thought you wanted to skip that simpler problem.

> I'm willing to move on with gray bodies. ... Let's move on. ... ***[Jane Q. Public, 2014-09-03]***

That's great news! Let's finally take the very first step in this calculation:

> > I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.
>
> Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. ***[Jane Q. Public, 2014-09-02]***

```
#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()
```

ANSWER: 29.3986743761843

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches Jane's "steady-state".

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-04 10:19 (#47827693)

Once again, no. I never said that all surfaces were at the same temperature. I've already explained that the final outer temperature of the enclosing shell doesn't happen at the same time as the initial temperature of the heated plate. Initially, the heated plate is at 150F and the enclosing shell is cooler than 100F. But because power in > power out, the plates slowly warm to a new steady-state.

You did say it, quite clearly. I quoted you twice and linked to your web page. **LATER** you changed your tune. I can accept that you changed it later, but you did say it.

Further, in your link there, you say:

Jane's insistence that "a non-zero difference is all we need" between the heated plate's initial temperature of 150F and the enclosing plate's final temperature of ~150F was interesting. In this thought experiment [archive.today], the enclosing plate was initially cooler than 100F.

It **is** interesting, because it is the heart of the matter. Since, according to the S-B relation, if we are using gray bodies as you have several times insisted we use, **the direction of net energy transfer via radiation** at any given time is determined solely by the temperature difference and nothing else. Therefore (this is elementary logic), a non-zero difference in radiant temperature *IS* all we need, if we are using gray

bodies, to determine which body is transferring energy to the other. At no time in this experiment are the temperatures equal, so net heat transfer is **always** in one direction and only one direction.

You then go on to say above:

By the time the outer temperature of the enclosing shell is ~149.6F (accounting for area differences), the heated plate is ~233.8F.

But you do not give any justification for this answer, you just throw it out there.

Earlier, you explained in some detail that you had calculated this number for **thermal equilibrium** using Kircchoff's radiation law. But as I've explained many times now, there is no thermal equilibrium so Kircchoff's law does not apply. Try again.

It feels as though I'm explaining to a high-school student who has never seen a physics problem before. Since the enclosing, passive plate is **at all times** cooler than the heat source, and therefore NET heat transfer is **only outward** from the heat source to that plate, then the **only** net energy input to the source remains the original electrical input.

So let's put 2 + 2 together here, which is really quite simple. We don't even need any math (but I welcome VALID math, if you can think of any to offer):

[1] Initial electrical input to heat source does not change.

[2] Since all other components of the system at all times remain cooler than the heat source, net power transfer to the rest of the system is invariably FROM the source TO the rest of the system. **Nothing** has been introduced to change that.

[3] Therefore, net input of power (energy per unit time) to the source remains a CONSTANT.

[4] Therefore, since any temperature of the source that is higher than the initial radiative equilibrium (150 deg. F) represents **higher power output** from that same source, any such higher temperature **would violate conservation of energy.**

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches Jane's "steady-state".

NO, we do not agree with that, because as you state yourself that equation is derived from Kircchoff's radiation law, which does not apply here. Sheesh. How many different ways must I explain this?

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-04 10:28 (#47827797)
I keep finding myself in a position where I feel I should explain, but I am at a loss as to why I should have to, because I am discussing this with someone who is supposed to have been a physics major.

You pointed out to MIT's derivation of energy transfer between infinite gray bodies. It does not apply here because (a) we have specifically defined areas, they are not infinite, and (b) that derivation makes use of Kircchoff's law which does not apply in Spencer's challenge.

This is a very simple but essential concept: I am not going to agree to calculations that were derived based on a physical principle that does not apply to the problem. This is a very basic concept. I do not agree with trying to solve a problem starting with invalid assumptions.
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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-04 10:39 (#47827937)
And just to hammer it home, here it is again, as a direct quote from your website, except that I have replaced the "degree" symbol with "deg." to compensate for Slashdot's character handling:

For the moment, letâ(TM)s pretend the enclosing shell is a thermal superconductor, so its inner temperature Tc1 is also 149.6 deg. F (338.5K). Energy conservation at equilibrium just inside the enclosing shell shows that the heated sphere will warm to an equilibrium temperature of 233.8 deg. F (385.3K)

Here are two invalid assumptions in two consecutive sentences. The first postulates a thermal superconductor (which is neither necessary or relevant), and the second assumes a THERMAL equilibrium that does not exist.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-04 10:53 (#47828121)

Huh? Of course we need the emissivities to model gray body heat transfer. If you'd like to solve the simpler problem of black body plates, then we can set the emissivities to 1, but I thought you wanted to skip that simpler problem.

Pardon me. That was a mistake on my part. I was thinking of specific wavelength emissivities and absorptivities, and was conflating that with your epsilons in my head. It was late and my thinking was muddled.

By all means, let's use emissivities and absorptivities. But you'll still have to modify your equation if that is based on the one you borrowed from MIT. I repeat that Kircchoff's law does not apply here.

What we have left is rather simple, except for "view factor". The view factor of the enclosing plate for radiation outward from the heat source is 1 or very close to it. The view factor of the heat source for radiation emitted by the enclosing plate is more complicated.

Not that it matters in the latter case, since because T(p) < T(s), no matter now much of the radiation from P strikes S, no net amount is absorbed; it is all reflected, transmitted, or scattered according to S-B.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-04 11:23 (#47828523)
Sigh. No, again I must correct myself. I would apologize for the confusion, but I'm not the one who has been causing it. I've just been getting mixed up in the maze of your assumptions.

Your second sentence above does not assume a thermal equilibrium. What it does, though, is violate conservation of energy.

If the power input to the object we call the heat source is constant, and it is the only net power input to the system (the outer walls are refrigerated), then we have a contradiction.

Enough power (for illustration we can assume your figure of 509W/m^2 but I haven't checked it for accuracy) is being input to warm the heat source to an initial temperature of 150 deg. F.

I am aware that the enclosing passive plate will absorb power and convert it to thermal energy. But even you admit that it remains cooler than the heat source.

Your figure of 233 deg. F radiant temperature at what you called "equilibrium" represents a constant **radiative power output** from the heat source greater than its initial power output at 150 deg. F. Where is this additional power coming from?

S-B law says all the heat transfer in the system under discussion is outward from the heat source. So from whence comes this magical additional power you have calculated?

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-04 15:21 (#47830497) Homepage Journal

> Once again, no. I never said that all surfaces were at the same temperature. I've already explained that the **final** outer temperature of the enclosing shell doesn't happen at the same time as the **initial** temperature of the heated plate. **Initially**, the heated plate is at 150F and the enclosing shell is cooler than 100F. But because power in > power out, the plates slowly warm to a new steady-state. By the time the outer temperature of the enclosing shell is ~149.6F (accounting for area differences), the heated plate is ~233.8F. This doesn't change even if we neglect area differences: the enclosing shell and the heated plate are never at the same temperature. Again, that's why I called them T_c and T_h.
>
> You did say it, quite clearly. I quoted you twice and linked to your web page. **LATER** you changed your tune. I can accept that you changed it later, but you did say it. [Jane Q. Public, 2014-09-04]

Once again, no. I never said that all surfaces were at the same temperature. I've already explained that the **final** outer temperature of the enclosing shell doesn't happen at the same time as the **initial** temperature of the heated plate.

> By the time the outer temperature of the enclosing shell is ~149.6F (accounting for area differences), the heated plate is ~233.8F.
>
> But you do not give any justification for this answer, you just throw it out there. [Jane Q. Public, 2014-09-04]

I've been explaining for over a month that the heated plate warms after it's enclosed. I realize you don't agree, which is why I'm trying in vain to get you to finally perform a single, solitary calculation of your own. But even if you don't agree with my statement that the heated plate warms after it's enclosed, can't you at least acknowledge that **this is what I'm saying** rather than trying to pretend that I somehow said all temperatures are the same?

> ... It may not be assumed that the temperatures are the same! As you have done at least once. ... [Jane Q. Public, 2014-09-03]

Once again, I **never** said that all surfaces were at the same temperature.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-04 15:24 (#47830523) Homepage Journal

> Earlier, when I saw your mentions of equilibrium, I thought you were referring to the steady-state that would eventually be achieved. ... [Jane Q. Public, 2014-09-02]

As I said: *"Energy is conserved, which means that if you draw a boundary around some system (like the heated plate), power going in minus power going out equals the rate at which energy inside that boundary changes. At equilibrium, that rate is zero because the system doesn't change. So at equilibrium, power in = power out."*

I explicitly said a system in "equilibrium" doesn't change, which Jane calls "steady-state". I repeatedly asked Jane if we could agree on that, but a month later Jane objected:

> ... Kircchoff's law does not apply to this experiment, and no situation arises in which the temperatures are the same everywhere, or the emissivities vs absorptivities. There is a steady-state arising from active (but constant) exchange. But there is no equilibrium. [Jane Q. Public, 2014-09-02]

> Earlier, when I saw your mentions of equilibrium, I thought you were referring to the steady-state that would eventually be achieved. But even though you mentioned Kircchoff's law, it didn't sink in to my brain that you were referring to actual, literal equilibrium. Uh-uh. As they say in my neck of the woods: it ain't happenin'. [Jane Q. Public, 2014-09-02]

> ... A steady-state is NOT the same thing as equilibrium. ... You do not get to re-define equilibrium any way you choose. Just no. ... [Jane Q. Public, 2014-09-03]

> ... That is a steady state. It is NOT "equilibrium". They are different things. ... [Jane Q. Public, 2014-09-03]

Note that my definition of equilibrium is identical to this one: *"Class 6- Equilibrium Temperature: Equilibrium means no change with time. ... In equilibrium, we expect ENERGY IN = ENERGY OUT ..."*

Also note that this definition of equilibrium doesn't require a planet's south pole to be at the same temperature as its equator, or its surface to be at the same temperature as its tropopause (for planets with an atmosphere).

But from now on I'll call the system in "steady state" when its temperatures don't change with time, in the naive hope that we might actually be able to finally take the very first step in this calculation.

> ... THERE IS NO RADIATIVE EQUILIBRIUM HERE. THERE IS NO THERMAL EQUILIBRIUM HERE. None. You may not assume them. ... In Spencer's challenge, thermodynamic equilibrium does not exist. ... in Spencer's challenge there very definitely is no equilibrium. [Jane Q. Public, 2014-09-03]

> ... Kircchoff's law (and MIT's example) both assume no bodies involved are storing thermal energy, and there is **thermal** equilibrium. In fact that is how Kircchoff's law is derived: technically Kircchoff's law only applies at thermal equilibrium. MIT was free to apply it in their example because thermal equilibrium was assumed. However in Spencer's challenge there very definitely is no equilibrium. It is not appropriate to assume it or try to apply it here: the whole point is that we are trying to determine **differing temperatures**. It may not be assumed that the temperatures are the same! As you have done at least once. ... [Jane Q. Public, 2014-09-03]

> ... Without thermal equilibrium (which unequivocally does not occur here), Kircchoff's law does not apply, except perhaps in coincidental specific cases. ... [Jane Q. Public, 2014-09-03]

Why would Jane think mentioning Kirchhoff's law means that I'm somehow trying to claim that all surfaces are at the same temperature? I first mentioned Kirchhoff's law by linking to MIT's explanation:

"... the relation "absorptance = emittance" is known as Kirchhoff's Law. It implies that good radiators are good absorbers. It was derived for the case when "body temperature = cavity temperature" and is not strictly true for all circumstances when the temperature of the body and the cavity are different... "

If Jane stopped reading there, he might conclude that any mention of Kirchhoff's law requires that all surfaces be at the same temperature. But keep reading:

"... the relation "absorptance = emittance" is known as Kirchhoff's Law. It implies that good radiators are good absorbers. It was derived for the case when "body temperature = cavity temperature" and is not strictly true for all circumstances when the temperature of the body and the cavity are different, ***but it is true if the absorptance and emittance are not functions of wavelength. This situation describes a 'gray body.'*** *... "*

So if absorptance and emittance aren't functions of wavelength, absorptance = emissivity even when surfaces are at different temperatures. And that's exactly what I said last month:

"The next step is to treat the plates as graybodies where absorptivity and emissivity are independent of wavelength, so they appear gray. Kirchhoff's Law states that absorptivity = emissivity for graybodies."

As you can tell, I only mentioned Kirchhoff's law to explain MIT's gray body approximation. As long as the surface emissivities and absorptivities are independent of wavelength, Kirchhoff's law applies in vacuum even for surfaces at different temperatures. That's why the gray body approximation is useful.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-04 15:25 (#47830533) Homepage Journal

> ... you had calculated this number for **thermal equilibrium** using Kircchoff's radiation law. But as I've explained many times now, there is no thermal equilibrium so Kircchoff's law does not apply. ... as you state yourself that equation is derived from Kircchoff's radiation law, which does not apply here. ... [Jane Q. Public, 2014-09-04]
>
> ... You pointed out to MIT's derivation of energy transfer between infinite gray bodies. It does not apply here because ... that derivation makes use of Kircchoff's law which does not apply in Spencer's challenge. ... [Jane Q. Public, 2014-09-04]
>
> ... you'll still have to modify your equation if that is based on the one you borrowed from MIT. I repeat that Kircchoff's law does not apply here. ... [Jane Q. Public, 2014-09-04]

No, I calculated this number for a system which doesn't change with time. From now on I'll call this condition "steady-state" but that doesn't change the fact that my equations are based on conservation of energy in a system that doesn't change with time. Again, I only mentioned Kirchhoff's law to explain MIT's gray body approximation. Since emissivity isn't a function of wavelength, all surfaces aren't required to be at the same temperature.

> ... You pointed out to MIT's derivation of energy transfer between infinite gray bodies. It does not apply here because (a) we have specifically defined areas, they are not infinite... [Jane Q. Public, 2014-09-04]

Notice that the first example MIT applies their final equation to is a thermos bottle which doesn't have infinite walls. That's because a thermos bottle has no edges (just like our fully enclosed plate!) so the infinite plate approximation applies. If not, why did MIT use their equation to model a thermos? Were they talking about a thermos with infinite walls?

> ... any temperature of the source that is higher than the initial radiative equilibrium (150 deg. F) represents **higher power output** from that same source, any such higher temperature **would violate conservation of energy.** [Jane Q. Public, 2014-09-04]

No, Jane. If power in != power out in steady-state, **that** would violate conservation of energy. Because my equations are based on the principle that in steady-state power in = power, their solutions satisfy conservation of energy.

> Your figure of 233 deg. F radiant temperature at what you called "equilibrium" represents a constant **radiative power output** from the heat source greater than its initial power output at 150 deg. F. Where is this additional power coming from? [Jane Q. Public, 2014-09-04]

No. The radiative power output is exactly the same as before the heat source was enclosed. It's hotter because radiative power output is proportional to T_h^4 - T_c^4. Before the heat source was enclosed, it was radiating to the chamber walls at T_c = 0F. After it's enclosed, it's radiating to the inside surface of the enclosing plate which is at T_c > 0F.

But as you said, it's pretty damned hard to prove anything without calculating it all the way through. So let's finally take the very first step in this calculation:

> > I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.
>
> Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. [Jane Q. Public, 2014-09-02]

```
#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-
8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()
```

ANSWER: 29.3986743761843

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches Jane's "steady-state".

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-04 20:23 (#47832019)

I've been explaining for over a month that the heated plate warms after it's enclosed. I realize you don't agree, which is why I'm trying in vain to get you to finally perform a single, solitary calculation of your own.

I never said I disagree with this. Please find where I said that. On the contrary; I definitely **agree** that it warms. In fact it must: Spencer stipulated that it was to be inserted when it was colder than the heat source.

I have been doing calculations. I just haven't been showing them here, because there isn't any point yet. Before there is any point to showing calculations, we must agree that certain conditions either do or do **not** exist, given the parameters of this experiment. That is what I am trying to sort out with you now.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-04 20:55 (#47832115) Homepage Journal

> I've been explaining for over a month that the heated plate warms after it's enclosed. I realize you don't agree, which is why I'm trying in vain to get you to finally perform a single, solitary calculation of your own.

> I never said I disagree with this. Please find where I said that. On the contrary; I definitely agree that it warms. In fact it must: Spencer stipulated that it was to be inserted when it was colder than the heat source. ... [Jane Q. Public, 2014-09-04]

I've been explaining for over a month that the heated plate (aka Jane's "source") warms after it's enclosed. I've only been wasting my final days because Jane's repeatedly disagreed by supporting Dr. Latour's ridiculous Sky Dragon Slayer claim that the heated plate (aka Jane's "source") simply remains at 150F after it's enclosed:

> ... the heat source does not become hotter. This is, and has been, the whole of Latour's argument, and it is valid. It is not crazy speculation by some nitwit, it is straightforward application of Stefan-Boltzmann law. Q.E.D., indeed. If the above inequalities hold (and they do), Latour's conclusion is the only one that is mathematically valid. ***[Jane Q. Public, 2014-08-02]***

> ... The plate cannot cause the heat source to be hotter ... ***[Jane Q. Public, 2014-08-20]***

If Jane agrees that the heated plate (aka Jane's "source") warms after it's enclosed, then that's great news! In that case, we can all agree that the mainstream physics describing the greenhouse effect is accurate, obeys the laws of thermodynamics, and proves that the Sky Dragon Slayers are wrong.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-04 20:59 (#47832143)

As I said: "Energy is conserved, which means that if you draw a boundary around some system (like the heated plate), power going in minus power going out equals the rate at which energy inside that boundary changes. At equilibrium, that rate is zero because the system doesn't change. So at equilibrium, power in = power out."

I explicitly said a system in "equilibrium" doesn't change, which Jane calls "steady-state".

I call it "steady state" because that is how **radiative** equilibrium is defined. It is a condition in which radiative transfer between elements of the system remains constant. I prefer to make sure this is kept distinct from thermal equilibrium.

I just want to make sure we're all talking about the same things. Because in the past, we sure as heck were not.

Why would Jane think mentioning Kirchhoff's law means that I'm somehow trying to claim that all surfaces are at the same temperature? I first mentioned Kirchhoff's law by linking to MIT's explanation:

Stop being obtuse. You were throwing around the term "equilibrium" rather loosely, and at one point you mentioned that "at equilibrium" the outer surface of the enclosing passive plate must be at the same temperature as the surface at the heat source:

Electric input of 509 W/m^2 is constant and the walls are held at 0F (255K). Therefore, the second plate has to radiate the same power out as the heated plate did before it was enclosed. So energy conservation at equilibrium requires that the second plate be at 150F (339K).

Now, if it isn't a **reasonable conclusion** that by this you meant thermal equilibrium, I don't what is, since you are claiming the heat source and the passive plate are the same temperature. Of course upon closer examination it could not have been actual thermal equilibrium, because you also mention the walls are at 0 degrees F, but then what actual kind of "equilibrium" you were referring to is worse than ambiguous, because at radiative equilibrium the stated condition is impossible. So why the hell are you trying to blame me for being confused? The condition you described is impossible, so how do you expect me to know what "equilibrium" you mean?

"... the relation "absorptance = emittance" is known as Kirchhoff's Law. It implies that good radiators are good absorbers. **It was derived for the case when "body temperature = cavity temperature"** and is not strictly true for all circumstances when the temperature of the body and the cavity are different, but it is true if the absorptance and emittance are not functions of wavelength. This situation describes a 'gray body.' ... "

Very well. You refuse to use real materials with measured absorptivities and emissivities, and insist on using gray bodies and Kirchhoff's law, neither of which actually represent Spencer's experiment in anything like the real world, even though it was intended to be a model of the real world.

I get that. But I want to make sure everyone else gets it too.

I offered to use real materials with measured emissivities in the approximate temperature range we are talking about (though you refuse to acknowledge that), but you refuse to use them.

Just so we know where we stand. I have already explained to you that there is no need to resort to gray bodies, and that we have plenty of information to calculate more realistic, real-world results. But whatever. You refuse to do anything but what you want to do, so let's just go with it for now. But I reserve the right to re-visit this issue.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-04 21:08 (#47832165)

Once again, I never said that all surfaces were at the same temperature.

Look, let's get this straight: what you actually meant was completely ambiguous for several reasons. You used the term "equilibrium" and you said:

Electric input of 509 W/m^2 is constant and the walls are held at 0F (255K). Therefore, the second plate has to radiate the same power out as the heated plate did before it was enclosed. So energy conservation at equilibrium requires that the second plate be at 150F (339K).

Will you acknowledge that **no matter what you meant**, this is still wrong? If the enclosing passive plate must radiate out the same power as the enclosed heat source, **it cannot be at the same temperature**, because radiated power is measured in W/m^2, and there are more m^2 in the enclosing passive plate. Therefore (SIMPLE MULTIPLICATION), because there is greater area they could not be at the same temperature and radiate outward the same power.

No matter how you try to bullshit your way around this, it is still WRONG.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-04 21:26 (#47832249)
It's just so hard to work my way though your maze of comments, some of which are correct, and others which are provably bullshit (see my other comments above).

THE FIRST STEP in mutually working your way through a problem is agreeing on the statement of the problem, as you well know. THAT is why I have not willing to get into calculations yet. That and nothing else. So let's make sure we agree on the statement of the actual experiment. I want you to acknowledge these in so many words, before I am willing to move forward. Because I'm just plain tired of your bull.

1. Conditions apply as per Spencer's experiment:

2. Constant input power sufficient to heat the source to a radiative temperature at radiative equilibrium of 150F.

3. Outer chamber walls actively cooled to a maintained radiative temperature of 0F.

4. Passive plate (which you insist in your variant of Spencer's challenge fully encloses heat source, with vacuum between).

5. Passive plate is introduced at a temperature that is cooler than the heat source.

6. Any other conditions that were actually contained in Spencer's challenge but not mentioned here.

7. Your own condition: you insist on using gray bodies, because you claim you're dying (or something of the sort, you really didn't specify so I won't assume), you don't have the spare 15 minutes or so it might take to do approximate, more real-world calculations, and want to use Kirchhoff's law (although it really isn't necessary) to make your life easy.

8. I reserve the right to re-visit this same scenario using more real-world materials, emissivities and absorptivities.

Are we agreed on these conditions? I want a simple yes or no. Anything else, and I am not willing to continue.
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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-04 21:33 (#47832279)

I've been explaining for over a month that the heated plate (aka Jane's "source") warms after it's enclosed.

Yes, you've been explaining it but you haven't been backing it up. See my other comment. Once we agree on the statement of the problem, we can move forward. I haven't been trying to block you, I've only been trying to get you to unambiguously agree to terms.

If Jane agrees that the heated plate (aka Jane's "source") warms after it's enclosed, then that's great news! In that case, we can all agree that the mainstream physics describing the greenhouse effect is accurate, obeys the laws of thermodynamics, and proves that the Sky Dragon Slayers are wrong.

No. Jane does not agree that "the heated plate" (if by that you mean THE HEAT SOURCE), gets warmer when it's enclosed. THIS IS WHAT I'VE BEEN TRYING TO

TELL YOU.

You need to use more precise language. In plain English, you have one heat SOURCE in this experiment, and THE OTHER plate is being "heated" by it. So the "heated plate" is the passive plate.

You insist on using confusing terminology, and wonder why other people have a hard time with it. Jesus, I'm glad you weren't one of my physics profs.

I suggested a standard terminology and variable names **to avoid exactly this problem.** You have refused to use them. That's your goddamned problem, and you don't get to complain about it.

I'm really looking forward to showing this latest exchange to my friends.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-04 21:48 (#47832317) Homepage Journal

> You were throwing around the term "equilibrium" rather loosely, and at one point you mentioned that "at equilibrium" the outer surface of the enclosing passive plate must be at the same temperature as the surface at the heat source:
>
> > Electric input of 509 W/m^2 is constant and the walls are held at 0F (255K). Therefore, the second plate has to radiate the same power out as the heated plate did before it was enclosed. So energy conservation at equilibrium requires that the second plate be at 150F (339K).
>
> ***[Jane Q. Public, 2014-09-04]***

Once again, no. I've repeatedly explained that the outer surface of the enclosing passive plate is **never** at the same temperature as the heat source.

> I've been explaining for over a month that the heated plate (aka Jane's "source") warms after it's enclosed.
>
> Yes, you've been explaining it but you haven't been backing it up. ***[Jane Q. Public, 2014-09-04]***

Again, Jane might not agree with the fact that the heat source warms after it's enclosed. But again, Jane could at least acknowledge that **this is what I'm saying** rather than trying to pretend that I somehow said all temperatures are the same. Please?

> Will you acknowledge that **no matter what you meant**, this is still wrong? If the enclosing passive plate must radiate out the same power as the enclosed heat source, **it cannot be at the same temperature**, because radiated power is measured in W/m^2, and there are more m^2 in the enclosing passive plate. Therefore (SIMPLE MULTIPLICATION), because there is greater area they could not be at the same temperature and radiate outward the same power. No matter how you try to bullshit your way around this, it is still WRONG. ***[Jane Q. Public, 2014-09-04]***

I've repeatedly explained ad nauseum that neglecting area ratios is an approximation. I've already shown how tiny the effects are for Earth's area ratio. For weeks you've refused to perform even the simplest calculation to confirm this. Why don't we check to see wrong these approximations are, by actually doing some calculations? Finally? Please?

> ... You refuse to use real materials with measured absorptivities and emissivities, and insist on using gray bodies and Kirchhoff's law, neither of which actually represent Spencer's experiment in anything like the real

> world, even though it was intended to be a model of the real world. I get that. But I want to make sure everyone else gets it too. I offered to use real materials with measured emissivities in the approximate temperature range we are talking about (though you refuse to acknowledge that), but you refuse to use them. Just so we know where we stand. I have already explained to you that there is no need to resort to gray bodies, and that we have plenty of information to calculate more realistic, real-world results. But whatever. You refuse to do anything but what you want to do, so let's just go with it for now. But I reserve the right to re-visit this issue. ***[Jane Q. Public, 2014-09-04]***
>
> ... you insist on using gray bodies, because ... you don't have the spare 15 minutes or so it might take to do approximate, more real-world calculations, and want to use Kirchhoff's law (although it really isn't necessary) to make your life easy. ... ***[Jane Q. Public, 2014-09-04]***

I already explained that you quoted absorptivities of sunlight, which aren't relevant because there's nothing in this experiment at 6000K.

I've also already explained that departing from the gray body approximation means that we'd have to recreate MODTRAN to derive heat transfer between non-gray bodies where emissivity and absorptivity are arbitrary functions of wavelength.

And once we debugged that new MODTRAN clone, we'd have to test it in a simple case, like the case of gray bodies where emissivity and absorptivity don't depend on wavelength. So we might as well solve the simple problem first.

> ... THAT is why I have not willing to get into calculations yet. That and nothing else. ... Are we agreed on these conditions? I want a simple yes or no. Anything else, and I am not willing to continue. ... ***[Jane Q. Public, 2014-09-04]***

Yes.

Now, could we please finally take the very first step in this calculation?

> > I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.
>
> Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. [Jane Q. Public, 2014-09-02]

```
#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()
```

ANSWER: 29.3986743761843

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches Jane's "steady-state".

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-04 22:04 (#47832347)

Once again, no. I've repeatedly explained [slashdot.org] that the outer surface of the enclosing passive plate is never at the same temperature as the heat source.

And once again, NO, it doesn't matter. I don't care at what time you assume this to be. Because **we have a constant power input** which has radiative power output at X W/m^2, which is required to reach the radiative temperature of 150F.

You then (at ANY time, I don't care when) claim that a larger surface is at the same temperature, which requires the same amount of W/m^2. But you have more m! So the total power output is greater than your input.

There is no way to weasel out of this, man. You're trying to output more power than you're putting in. This isn't even 11th-grade physics.

Let's try it at something more like your level:

You have 200 beans equally distributed among 10 squares. If you now take those beans, and divide them equally among 25 squares of the same size, how many beans do you now have per square?

Show your work.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-04 22:17 (#47832369) Homepage Journal

> ... You then (at ANY time, I don't care when) claim that a larger surface is at the same temperature, which requires the same amount of W/m^2. But you have more m! So the total power output is greater than your input. There is no way to weasel out of this, man. You're trying to output more power than you're putting in. This isn't even 11th-grade physics. Let's try it at something more like your level: You have 200 beans equally distributed among 10 squares. If you now take those beans, and divide them equally among 25 squares of the same size, how many beans do you now have per square? Show your work. ***[Jane Q. Public, 2014-09-04]***

Cute. I've repeatedly explained ad nauseum that neglecting area ratios is an approximation. I've already shown how tiny the effects are for Earth's area ratio. Does this mean you don't intend to perform even the simplest calculation to confirm this? Why don't we check to see wrong these approximations are, by actually doing some calculations? Finally? Please?

> > I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.
>
> Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. [Jane Q. Public, 2014-09-02]

#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()

ANSWER: 29.3986743761843

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches Jane's "steady-

state".

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-05 0:22 (#47832643)

Cute. I've repeatedly explained ad nauseum that neglecting area ratios is an approximation. I've already shown how tiny the effects are for Earth's area ratio. Does this mean you don't intend to perform even the simplest calculation to confirm this? Why don't we check to see wrong these approximations are, by actually doing some calculations? Finally? Please?

THERE'S NOTHING "CUTE" ABOUT IT!

IT'S AN ACCURATE ASSESSMENT OF YOUR ERROR!

This is not "approximation", it's fucking logical error! JESUS CHRIST, man, you can't talk your way around this.

X / 3 = X / 3.

X / 6 < X / 3

End.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-05 0:25 (#47832649) Homepage Journal

Then it should be easy to show how badly this approximation screws up the calculation, right? So why don't we check to see wrong these approximations are, by actually doing some calculations? Finally? Please?

> I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.
>
> Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. [Jane Q. Public, 2014-09-02]

```
#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()
```

ANSWER: 29.3986743761843

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches Jane's "steady-state".

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-05 0:32 (#47832667)
If your time is really short as you say, then just abandon those recent sidetracks (which is in your own best interest anyway) and let's continue.

If you agree to the problem description I laid out above, in this comment, just say yes. Then we can continue.

But I will repeat, and keep repeating as long as necessary, that unless we agree on what it would take to refute Latour, then there is no point in going further. You can violate thermodynamics all you want, and it doesn't prove a damned thing.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-05 0:36 (#47832681) Homepage Journal

I already said yes.

Could we finally take the very first step in this calculation? Please?

> I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.

> Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. [Jane Q. Public, 2014-09-02]

#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()

ANSWER: 29.3986743761843

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches Jane's "steady-state".

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-05 0:40 (#47832697)
You're sidestepping again, and you're ignoring the important point, again.

This is a sidetrack, about an OLD comment you made that was stupid and inaccurate.

You can argue about THAT comment until the cows come home and die of old age, and you still won't be correct. BUT IT'S IRRELEVANT TO THE POINT NOW AT HAND.

If you want to move on, see my other comments which describe the problem. If you continue to refuse to agree to the definition of the problem, I will (with every justification in the logical world) declare you in default.

STOP THE BULLSHIT. It is pretty obvious what it would actually take to refute Latour. I have described in my other comment a statement of the actual challenge. If you refuse to agree with my description of the problem, without having a reasonably valid objection, I shall (with perfect justification) declare you in default.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-05 0:43 (#47832705) Homepage Journal

Let's finally move on. Could we finally take the very first step in this calculation? Please?

> I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.

> Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. [Jane Q. Public, 2014-09-02]

#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()

ANSWER: 29.3986743761843

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches Jane's "steady-state".

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-05 0:43 (#47832707)
BEFORE you do the math, the problem must be defined. No reasonable scientist would disagree with that. So far, you have refused at every turn to define the problem, even though this is the well-known first step to proving anything.

If you continue to just bullshit your way around, as I have stated I will declare you in default and damned few reasonable people would disagree.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-05 0:45 (#47832715) Homepage Journal

I already said yes.

Could we finally take the very first step in this calculation? Please?

> I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.

> Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. [Jane Q. Public, 2014-09-02]

#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()

ANSWER: 29.3986743761843

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches Jane's "steady-state".

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-05 0:48 (#47832717)
NO. See my comment above. One more bullshit comment like this, and as I said, I will just call you a clown and few reasonable people will disagree.

Will you, yes or now, agree to the definition of Spencer's experiment, as I have already described and asked you now about 3 times.

That is the FIRST step in solving any problem. I will not agree to any math regarding the problem until we have an agreement about what the problem is. Anything else is nonsense.

ONCE THAT IS DONE, I agree to move on with calculations about the problem before us.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-05 0:50 (#47832727) Homepage Journal

Once again, I already said yes.

Could we finally take the very first step in this calculation? Please?

> I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or

absorber.

> Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. [Jane Q. Public, 2014-09-02]

#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()

ANSWER: 29.3986743761843

Can we agree on that? If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches Jane's "steady-state".

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-05 1:08 (#47832765)
I asked for a simple yes or no. You did not give me a simple yes or no, you had to bury it in the middle of about 500 words about other things. If you had simply written "yes", one word, you would have saved both of us about 20 minutes.

I am entirely convinced that you are deliberately trying to make things difficult.

SO... you have agreed. Now we may proceed with calculations. But I will not, more, tonight.

But -- and this is no joke -- I expect you to show and describe your work. We start from extant conditions and proceed from there, in a step-wise manner. My intent, as it was before, is to minimize confusion and misunderstandings, which it is pretty obvious have been rampant. So... as is often the case in programming, if we proceed slowly in a step-wise manner, we achieve the end result all the sooner, because errors don't crop up.

I was serious about this: you have had a tendency to make assumptions and use terms loosely. We have had LOTS of misunderstandings here, and I am willing to chalk some of them up to communications problems, but not all of them.

So let's go slowly, and start simply. The first step is to define the initial conditions. We have a fixed power input, which heats the "source" (and I am calling it that for good REASONS), which we are assuming is a spherical body. Specific dimensions are up to you, I really don't care very much, although I have to wonder why you picked radii that seem so inconvenient... but on the other hand I admit that I did not do any calculations at this point **using your dimensions**
So, since we are starting fresh, describe your equation now, what the variables represent, and how you arrived at the formula. I suspect that it is a bit premature.

I will check in again tomorrow.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-05 1:45 (#47832871) Homepage Journal

Once again, energy is conserved, which means that if you draw a boundary around some system (like the heated plate), power going in minus power going out equals the rate at which energy inside that boundary changes. At steady-state, that rate is zero because the system doesn't change. So at steady-state, power in = power out.

I've specified the dimensions. The heated plate is a sphere with radius 6371 mm, surface area A_h, temperature T_h and emissivity epsilon_h. The enclosing plate is a 1 mm thick concentric shell with emissivity epsilon_c, an inner radius of 6378 mm, surface area A_c1 and temperature T_c1 on the inside, and A_c2 and T_c2 on the outside. The chamber walls at temperature T_c are a concentric sphere with inner radius 6386 mm, so there's a 7 mm gap on both sides of the enclosing shell. The plates and walls are oxidized aluminum, which are treated as gray bodies.

Since the enclosing shell has no edges and has nearly the same area as the heated plate, MIT's infinite plate approximation describes net heat flow (in W/m^2):

net heat flow = sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1) (Eq. 2)

At steady-state, net heat flow (in W/m^2) equals the electrical input. Note that MIT's Eq. 2 reduces to my Eq. 1 for blackbodies where epsilon_h = epsilon_c = 1.

The plates and chamber walls are made of oxidized aluminum with emissivity = 0.11.

Here's my Eq. 2 using Jane's variable names:

net heat flow = sigma*(T(s)^4 - T(w)^4)/(1/E(s) + 1/E(w) - 1) (Eq. 2J)

Note that it reduces to my simpler blackbody Eq. 1 if E(s) = E(w) = 1.

If you'd like me to clarify what my variable names for a particular equation would be in your terminology, just ask.

At steady-state, net heat flow out (in W/m^2) equals "electricity". The first step is to calculate that constant variable "electricity" which describes electrical power per square meter heating the sphere to 150F without an enclosing shell. I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.

> I calculated 29.4 W/m^2, which is less than with the simpler blackbody plates because aluminum isn't a perfect emitter or absorber.

> Show your calculations where we can see them. I'm not doing this just for me, I want to show other people just how much a clown you actually are. I am not going to install Sage today just to check your math, and probably neither is anybody else who sees this. ... I have reasons for wanting it public-readable, and I will accept nothing else. [Jane Q. Public, 2014-09-02]

```
#Calculate constant electrical power/area heating 1st plate.
var('sigma T_c T_h electricity epsilon_h epsilon_c')
eq1 = electricity == sigma*(T_h^4 - T_c^4)/(1/epsilon_h + 1/epsilon_c - 1)
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8,epsilon_h=0.11,epsilon_c=0.11),electricity)
soln1[0].rhs().n()
```

ANSWER: 29.3986743761843

Can we agree on that? If not, a month ago I said we could use Wikipedia's equation which includes areas. After I mentioned view factors, Jane agreed that the relevant view factor is 1.0 or very close to it. Happily, the relevant view factor is exactly 1.0.

I solved this equation to see how much error was introduced by assuming the areas were negligibly similar:

```
#A_h - area of heated plate (aka Jane's "source")
(4*pi*6.371^2).n()
```

ANSWER: 510.064471909788

#A_c - area of chamber walls
(4*pi*6.386^2).n()

ANSWER: 512.469109758699

#A_c2 - outer area of enclosing shell
(4*pi*6.379^2).n()

ANSWER: 511.346241712453

#A_c1 - inner area of enclosing shell
(4*pi*6.378^2).n()

ANSWER: 511.185932522526

#Calculate constant electrical power heating 1st plate.
var('sigma T_c T_h A_c A_h F_hc power epsilon_h epsilon_c')
eq1 = power == sigma*(T_h^4 - T_c^4)/((1-epsilon_h)/(epsilon_h*A_h) + 1/(A_h*F_hc) + (1-epsilon_c)/(epsilon_c*A_c))
soln1 = solve(eq1.subs(T_c=255.372,T_h=338.706,sigma=5.670373E-8, epsilon_h=0.11, epsilon_c=0.11, F_hc=1, A_h=510.064471909788, A_c=512.469109758699),power)
soln1[0].rhs().n()

ANSWER: 15028.4258648090

#Just to compare to the old "electricity" variable: power/A_h.
15028.4258648090/510.064471909788

ANSWER: 29.4637770173238

The difference between this more accurate solution (~29.46 W/m^2) and the earlier solution which neglected the area ratio (~29.40 W/m^2) might be informative. Can we agree on either of these solutions?

If so, we can move on to the next step, which is calculating the final outer surface temperature of the enclosing shell once it reaches steady-state.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-05 10:07 (#47835685)
You are a bit too eager to "pounce" with your solution. There was no need to repeat it 3 times. "I say it 3 times" does not make your analysis correct. Only correct analysis will. I will proceed from this post.

Once again, you zoomed ahead and did not proceed carefully. You are overlooking things. If you want this to be an actual solution of the problem, then let's do the problem completely. I have stated several times that I am only willing to do this if you agree to do it thoroughly.

Once again, energy is conserved, which means that if you draw a boundary around some system (like the heated plate), power going in minus power going out equals the rate at which energy inside that boundary changes. At steady-state, that rate is zero because the system doesn't change. So at steady-state, power in = power out.

I agree, as long as you can legitimately draw a boundary around your system. So let's start out by drawing appropriate boundaries around out initial system.

I agree with your calculations for area. However I do not agree with your calculation for initial power output (which corresponds to our constant input).

We know the initial temperature of the heat source: 338.7K.

The acknowledged formula for finding radiative power from temperature is just (sigma epsilon)T^4. There are no other factors involved, so our power input is equivalent to the power output of the heat source. There is no reason to not assume perfect efficiency here. You don't show your work here, just an unreadable Sage file, so I don't know where the discrepancy lies.

This formula for radiative power output from radiative temperature and the corresponding formula for temperature from power both make use of (sigma epsilon), and epsilon is a scalar, so I will abbreviate it to (se) and pre-calculate it to make later calculations easier (I am using an HP, not Sage):

(se) = ((5.67 * 10^-8 W/m^2) / K^4) * 0.11 = (6.24 * 10^-9 W/m^2)/K^4

So here now is the reason for this preliminary setup: in our initial steady-state, heat source is 338.7K so total power output from the heat source (and therefore constant power input to the system) is just (se) * 338.7^4 * area

Therefore radiative power (W/m^2) = (6.24 * 10 ^-9) * 338.7^4 = 82 W/m^2

So then the total power of the heat source is 82 W/m^2 * 510.064 m^2 = 41.886 * 10^3 W

This does not seem like an unreasonable figure for heating a 12+m dia. sphere with 510 m^2 surface area to 150F.

So who is wrong and why?

No point in going further until we straighten this out.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-05 10:50 (#47836161) Homepage Journal

> The acknowledged formula for finding radiative power from temperature is just (sigma epsilon)T^4. There are no other factors involved... So who is wrong and why? No point in going further until we straighten this out.
> ***[Jane Q. Public, 2014-09-05]***

You're wrong. I've repeatedly explained how to calculate the required electricity. Note that conservation of energy at steady-state demands that the temperature of the chamber walls be taken into account.

One way to see this is to consider how much power the electrical heater would need if the chamber walls were also at 150F. The correct answer is zero watts, because the heated plate wouldn't lose net heat to walls at the same temperature. But since your expression doesn't depend on the chamber wall temperature, you wouldn't be able to obtain the correct answer of zero in that case.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-05 12:56 (#47837185)
YOU are contradicting yourself: "Power out = power in", you said. Right?

I have calculated the radiative power output using nothing more than area (~ 510 m^2), radiative temperature (338.7K), the emissivity you gave (0.11), and the well-known and proven relation:

Radiative power out (in W/m^2) = emissivity * sigma * T^4, where sigma is the Stefan-Boltzmann constant.

This is the textbook solution. Please show where it is incorrect. Simply asserting that it is incorrect is not sufficient.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-05 13:02 (#47837237)

One way to see this is to consider how much power the electrical heater would need if the chamber walls were also at 150F. The correct answer is zero watts, because the heated plate wouldn't lose net heat to walls at the same temperature. But since your expression doesn't depend on the chamber wall temperature, you wouldn't be able to obtain the correct answer of zero in that case.

No, I am not wrong, you are. You are describing a radiative power **difference**, or net transfer.

That is not what I was doing. I was simply calculating the net power output of the heat source at 150 deg. F using the textbook example of how to do that.

It is not a difference. It is a constant radiative power output that depends on NOTHING else but temperature and emissivity, and the S-B constant.

It doesn't matter what temperature an opposing surface is at. I'm calculating the power output of THIS surface, at THIS temperature. As long as the temperature OF THIS SURFACE remains the same, the radiative power output remains the same. The way to calculate it is well-known and I have clearly stated it in my calculations.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-05 13:14 (#47837327) Homepage Journal

> YOU are contradicting yourself: "Power out = power in", you said. Right? I have calculated the radiative power output using nothing more than area (~ 510 m^2), radiative temperature (338.7K), the emissivity you gave (0.11), and the well-known and proven relation: Radiative power out (in W/m^2) = emissivity * sigma * T^4, where sigma is the Stefan-Boltzmann constant. This is the textbook solution. Please show where it is incorrect. Simply asserting that it is incorrect is not sufficient. ***[Jane Q. Public, 2014-09-05]***
>
> ... It doesn't matter what temperature an opposing surface is at. I'm calculating the power output of THIS surface, at THIS temperature. As long as the temperature OF THIS SURFACE remains the same, the radiative power output remains the same. The way to calculate it is well-known and I have clearly stated it in my calculations. ***[Jane Q. Public, 2014-09-05]***

The required electrical power to keep the heated plate at 150F is completely independent of the chamber wall temperature? Really? Doesn't this seem a even little strange to you? You're claiming that we'd have to pump 41.886 * 10^3 W into the heated plate regardless of the chamber wall temperature? Even if the chamber wall temperature were also 150F? Why would we need to continually heat a plate that's at the same temperature as its surroundings? Where would that energy go?

Another way to see that you're wrong is to write down the incorrect equation you're describing. Here it is in your notation:

electricity = sigma*E(s)*T(s)^4

As I've stressed, it's helpful to compare complicated solutions to simpler ones. If we set E(s) = 1 then your equation should reduce to the simpler blackbody solution.

Once again, a blackbody plate is heated by constant electrical power flowing in. Blackbody cold walls at 0F (T(w) = 255.4K) also radiate power in. The heated plate (Jane's "source") at 150F (T(s) = 338.7K) radiates power out. Using irradiance (power/m^2) simplifies the equation:

electricity + sigma*T(w)^4 = sigma*T(s)^4 (Eq. 1J)

Since Jane's proposed equation doesn't reduce to the simpler Eq. 1J for blackbodies where E(s) = 1, it's wrong.

Note that the equations I've shown here all reduce to the correct blackbody equation.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-05 13:54 (#47837633)

The required electrical power to keep the heated plate at 150F is completely independent of the chamber wall temperature?

No. That is not what I wrote. You are drawing a conclusion that does not follow from my actual words. Making assumptions again.

It is dirt simple to show you are wrong.

The **initial** conditions, with the surface of the heat source at 338.7K, **ARE A STEADY-STATE**. The radiative transfer between the surface of the heat source and the chamber wall is already accounted for. You are trying to account for it twice. It is easy to show this.

The temperature of this surface is a GIVEN, initial steady-state condition. **It is known, and a constant** at this time. YOU are trying change it, and give one surface 2 different temperatures at the same time.

Proof: all we have to do is plug your value for radiative power output back into **the known, canonical equation for radiative temperature**.

Temperature is the 4th root of ((power in W/m^2) / (se)). So using your calculated value: 4th root of ((29.399) / ((6.24 * 10^-9 W/m^2) / K^4)) = 4th root of 3749839743.59 = 247.46K = -14.24 degrees F.

However, we already **know** what this temperature is, because it's a given:: 150 deg F (338.7K).

Your value gives a wrong answer. Your methodology contradicts itself, which is what I have been saying all along.

Plug my 82.12 W/m^2 back into the same **canonical equation for radiant temperature for a given radiative power output**, and the answer comes out just as it should: 150 degrees F.

If you can't even get the initial conditions right, we might as well stop here.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-05 13:59 (#47837673) Homepage Journal

Just so we're clear, you calculated that a heated plate would need 82.12 W/m^2 to keep it at 150F, regardless of the chamber wall temperature?

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-05 23:54 (#47839801) Homepage Journal

> No, I am not wrong, you are. You are describing a radiative power **difference**, or net transfer. That is not what I was doing. I was simply calculating the net power output of the heat source at 150 deg. F using the textbook example of how to do that. ... ***[Jane Q. Public, 2014-09-05]***

Calculating the necessary electrical power to keep the heated plate (Jane's "source") at 150F requires calculating net radiative transfer. Despite Jane's claim, Jane didn't calculate net radiative power output. Jane actually just calculated the radiative power out from the heated plate. The net radiative power output which determines the necessary electricity is "power out - power in" so Jane's missing the same half of the equation that all Sky Dragon Slayers miss.

> ... It is dirt simple to show you are wrong. ... all we have to do is plug your value for radiative power output back into **the known, canonical equation for radiative temperature**. Temperature is the 4th root of ((power in W/m^2) / (se)). So using your calculated value: 4th root of ((29.399) / ((6.24 * 10^-9 W/m^2) / K^4)) = 4th root of 3749839743.59 = 247.46K = -14.24 degrees F. However, we already **know** what this temperature is, because it's a given:: 150 deg F (338.7K). ... ***[Jane Q. Public, 2014-09-05]***

Jane plugged my **net** radiative power transfer into an equation describing only "power out". A nonsensical answer is expected, but Jane should also check his arithmetic: "4th root of ((29.399) / ((6.24 * 10^-9 W/m^2) / K^4)) = 4th root of 3749839743.59".

Instead, I got "4th root of 4711378205.13 = 261.99K = **+11.91 degrees F**."

I noticed Jane's arithmetic error because his more fundamental mistake is completely ignoring the power radiated in from the chamber walls, and reflections from those aluminum walls. So Jane's "dirt simple" calculation is only valid for blackbody chamber walls at 0K (-459.7F), rather than the 255.4K (0F) aluminum walls in this experiment.

Of course, that would only be possible after an infinite number of steps. But I calculated something similar out of whimsy last month: *"Fully exposing the plate to the cosmic microwave background radiation cools it to 13F (263K), which is lower than before because the CMBR is a blackbody and aluminum chamber walls aren't."*

Because Jane is unintentionally treating the chamber walls as a 0K blackbody, my +13F CMBR prediction shouldn't have been much warmer than Jane's -14F prediction. The comparatively tiny 2.7K CMBR temperature didn't seem like it could cause my CMBR prediction to be ~27F warmer than Jane's 0K prediction. And it didn't. After Jane's arithmetic was corrected, my CMBR prediction is only ~1F warmer than Jane's 0K prediction.

But those whimsical scenarios are different from the actual experiment with aluminum chamber walls at 255.4K (0F).

> ... The radiative transfer between the surface of the heat source and the chamber wall is already accounted for. You are trying to account for it twice. ... ***[Jane Q. Public, 2014-09-05]***

Accounted for how? Where did Jane's calculation depend on the chamber wall temperature?

> The required electrical power to keep the heated plate at 150F is completely independent of the chamber wall temperature?

No. That is not what I wrote. You are drawing a conclusion that does not follow from my actual words. Making assumptions again. ***[Jane Q. Public, 2014-09-05]***

If Jane didn't mean that a heated plate (Jane's "source") would need 82.12 W/m^2 to keep it at 150F regardless of the chamber wall temperature, it would be easy for Jane to demonstrate this. Jane could simply redo his calculation with a chamber wall temperature other than 0F (like 150F), and show that the required electrical heating power changes from 82.12 W/m^2 to something else (like zero).

However, this is **impossible** because Jane's calculation never accounted for the chamber wall temperature.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-06 9:41 (#47841493)
I calculated the radiant power out from a surface of ~510 m^2 at 150 degrees F, using the canonical textbook formula for doing so.

I did nothing more. I did not need to do anything more. The system is in a steady-state and the temperature is known.

Wait... I did do something more. I also showed that your own calculation was incorrect.
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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-06 9:53 (#47841541)
You have not only made assumptions that don't actually apply, you have thrown around equations without carefully considering how they apply to the clearly stated problem. I said this in the beginning, and I have proven it now.

We already know, at the given steady-state, that the heat source is at 338.7K. We already know it is a sphere with a surface area of approximately 510 m^2. You have insisted we assume that it is a gray body. Given those two numbers, the emissivity, and the Stefan-Boltzmann constant, we calculate the power out: 82.12 W/m^2.

We do not need to do anything else at this point. We already know that this is the temperature GIVEN any heat transfer to the walls... which we have not calculated yet. I was going to go on to do that, but it isn't necessary now. We've seen that you're already wrong.

This was precisely why I insisted we do this slowly and carefully, and explain our steps. Because I knew you were doing it incorrectly (I said so) and that it would show up in the calculations. I did not expect it quite this soon, but there it is.

YOU may not understand that I have already proved your "refutation" wrong, but I assure you that other people will have no such difficulty. And they will have ample opportunity to see this, because I'm going to post it all online.
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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-06 10:00 (#47841577)
I wasn't TRYING to calculate heat transfer. I was only calculating radiative power out. That was a necessary step to THEN going on to calculate the radiative power of the chamber walls, and THEN calculating the net heat transfer.

The TEMPERATURE of the heat source does not depend on heat transfer. It is an independent variable. On the contrary: the net heat transfer depends on the temperature, not the other way around.

We have already seen that you have mis-applied your equation and arrived at a power out figure that gives an incorrect value of temperature, which is an already known value.

Your "refutation" is disproved, almost before we've properly begun.

QED

I don't care if you don't understand that. Other people will.
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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-06 10:47 (#47841831)
If you want to be clear, then let's be clear:

I was not trying to calculate electricity. I was merely calculating radiative power out of the heat source at a known temperature.

The next step (because, as I have repeatedly stated, I am going slowly and carefully, in a step-wise manner) would have been to calculate the radiative power out of the chamber walls.

I was not calculating any heat transfer. On the contrary: heat transfer is dependent on those two values. I hadn't even calculated the second value yet.

I have been very straightforward and clear about what ***I*** am doing.

Furthermore, your value for electricity is completely **irrelevant to the problem at hand**, which was to calculate internal temperatures under the given conditions.

In these initial conditions, I'm stating that **the radiant power** of the heat source is 82.12 W/m^2.

I admit that I made an error somewhere, and plugged in the wrong number. 29.4 / (6.24 * 10 ^-9) is indeed 4711538461.55, and the 4th root of that is 261.99K, or 11.91 degrees F.

However: as you have said, let's be clear: you throw around terminology fast and loose, and you have refused to show your calculations, which leads to misunderstandings. So: what, then, do you claim that 29.4 W/m^2 figure represents and why?

I don't give a rat's ass about "electricity" at this point. **The radiative power**, (we are using units of W/m^2) of a gray body surface depends only on its temperature, its area, its emissivity, and the Stefan-Boltzmann constant. I do not need to know what the net heat transfer is to calculate this value (which **IS** 82.12 W/m^2 at the surface of the heat source under the given conditions). The total **radiated power** in Watts is: W/m^2 times the area. This is all pure textbook stuff. It matters not a whit at this point what

that radiation strikes AFTER it is emitted. Even considering that right now is premature.

If I misunderstood, and your 29.4 W/m^2 represents something **other than** radiative power at the surface of the heat source at 338.7K, then please state clearly in plain terms what it **IS** supposed to represent, so we can move on.

The next **step** in the problem I am analyzing, because as I stated I am doing this in a careful stepwise manner precisely to avoid these misunderstandings is to calculate the radiative power of the chamber walls at 0 deg. F, or 255.37K.

But let me be clear: I don't give a damn about electricity at this point. In fact, I don't give the slightest damn whether the sphere is heated by steam, or an internal campfire, or burning unicorn farts. We know the power required for a gray body of the given area and emissivity to have a radiative temperature of 338.7K.

That is all I was saying. Nothing else. Trying to assume what I'm doing with that number before I do it is magical thinking.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-06 11:35 (#47842069) Homepage Journal

> #Calculate constant electrical power/area heating 1st plate. ... **ANSWER:** 29.3986743761843 ... Can we agree on either of these solutions?
>
> ... radiative power (W/m^2) = (6.24 * 10 ^-9) * 338.7^4 = 82 W/m^2 ... total power of the heat source is 82 W/m^2 * 510.064 m^2 = 41.886 * 10^3 W. This does not seem like an unreasonable figure for heating a 12+m dia. sphere with 510 m^2 surface area to 150F. So who is wrong and why? No point in going further until we straighten this out. ***[Jane Q. Public, 2014-09-05]***

Once again, I calculated the electrical power/area necessary to keep the heated plate (Jane's "source") at 150F inside 0F chamber walls, and asked if we could agree. Jane calculated a different value, then asked "who is wrong and why?" Since I calculated the electrical power necessary to keep the heated plate (Jane's "source") at 150F inside 0F chamber walls, the only way Jane's calculation could show that someone was "wrong" is if we were calculating the same value.

> ... I was not trying to calculate electricity. ... your value for electricity is completely **irrelevant to the problem at hand**... So: what, then, do you claim that 29.4 W/m^2 figure represents and why? I don't give a rat's ass about "electricity" at this point. ... If I misunderstood, and your 29.4 W/m^2 represents something **other than** radiative power at the surface of the heat source at 338.7K, then please state clearly in plain terms what it **IS** supposed to represent, so we can move on. ... I don't give a damn about electricity at this point. ... ***[Jane Q. Public, 2014-09-06]***

So what electrical power is necessary to keep the heated plate (Jane's "source") at 150F inside 0F chamber walls? Once again, I got 29.4 W/m^2.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-06 12:56 (#47842447) Homepage Journal

It's always best to agree on the equation before plugging values in. That way

disagreements about the physics of the equation can be resolved before wasting time crunching numbers.

So instead of asking you what electrical power is necessary to keep the heated plate (Jane's "source") at 150F inside 0F chamber walls, I should've asked you to simply write down your equation which determines that electrical power based on the experiment configuration.

This would only require a 1 line answer. I've shown that I'm happy with your variable names, so feel free to use them.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-06 15:29 (#47843065)
It's not a matter of the equation. I repeat: you jumped way ahead, and used a shortcut. That's not what I am doing, and that's the source of the problem here.

I've only calculated the radiant power value of one surface so far! I haven't even calculated the second yet. So how you could you possibly think I had calculated net heat transfer?

I'm not trying to calculate your "electricity" value. I don't want to calculate your electricity value. I'm starting from the basics, and working all the way through. I'm not using your shortcut. Is this clear?

Do you have a problem with my formula for calculating radiant power of a gray body surface at a given temperature? If not, I will continue. I repeat: it isn't dependent on any heat transfer, the only variables are emissivity and temperature. With that, and the Stefan-Boltzman constant, you can calculate the radiant power value.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-06 15:37 (#47843109) Homepage Journal

> ... Do you have a problem with my formula for calculating radiant power of a gray body surface at a given temperature? If not, I will continue. ...
> ***[Jane Q. Public, 2014-09-06]***

Again, I've agreed that a heated plate (Jane's "source) surrounded by 0K blackbody walls would require 82 W/m^2 to stay at 150F. I agreed because the whimsical calculation of 13F I did last month with a heated plate surrounded by the 2.7K blackbody CMBR agreed with Jane's corrected "dirt simple" calculation of 11.91F.

I also agree because changing the chamber walls to a 0K blackbody in my equation yields 82 W/m^2.

So please continue.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-06 15:56 (#47843193)
If you want to be technical, what I calculated is variously called irradiance, radiant

emittance, radiosity, or radiant exitance. And sometimes "emissive power", and probably by other names too.

It is not radiant flux, or radiant energy. Nor is the irradiance (I'll use that term from now on for clarity) of the heat source I calculated dependent on the chamber wall in any way. I repeat: the only variables for calculating this value for a gray body are temperature and emissivity. It is independent of any other object, and it is independent of absorbed incident radiation.

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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-06 16:04 (#47843201) Homepage Journal
Please continue.

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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-06 17:17 (#47843455) Homepage Journal

I can't stand the suspense. What's Jane's next step? Everything Jane's said makes me think his next step will be to calculate the irradiance in.

net irradiance = irradiance out - irradiance in

net irradiance = sigma*E(s)*T(s)^4 - sigma*E(w)*T(w)^4 (Jane's equation?)

Before Jane plugs in T(w) = 255.4K (0F), could Jane very quickly just say if this is really Jane's equation for net irradiance? Please? I know Jane is a busy professional, so just a yes/no answer would help.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-06 18:58 (#47843847)
Very well. As I say I'm doing intermediate calculations for later.

So initial irradiance of the heat source at 338.7K is 82.12 W/m^2

Initial radiative output of heat source at 338.7K is 82.12 W/m^2 * 510.065 m^2 = 41886.54 W

Irradiance of the outer wall at 255.37K = (se)T^4 = (6.24 * 10^-9 W/m^2) / K^4 * 255.4^4 = 26.55 W/m^2

We agreed on gray bodies, so absorptivity = emissivity = 0.11.

The "view factor" from the spherical heat source to the chamber wall is 1. All radiated output intercepts the wall.

Incident radiation on chamber wall: 41887W / 512.469 m^2 is 81.73 W/m^2

81.73 W/m^2 incident radiation * 0.11 absorptivity = 8.99 W/m^2 absorbed.

So transfer from source to walls is = 8.99 W/m^2 absorbed * 512.469 m^2 = 4607.09

W

This makes perfect sense, since the areas are not that much different and the absorptivity is only 0.11.

Are we in agreement so far? I know I'm taking the long way around. I said I would.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-06 19:19 (#47843923) Homepage Journal

I've agreed that a heated plate (Jane's "source) surrounded by 0K blackbody walls would require electrical heating power per square meter of 82 W/m^2 to stay at 150F, and 26.5 W/m^2 to stay at 0F. That's because changing the chamber walls to a 0K blackbody in my equation yields those answers.

So please continue. The next step is to calculate the enclosing shell's final outer steady-state temperature. Then we account for the finite conductivity of the shell to obtain its final inner steady-state temperature. Finally we solve for Jane's "source" final steady-state temperature. Hopefully we can finish this today?

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-06 20:31 (#47844107)
I didn't assume a black body. But whatever.

We understand that I'm still working on the initial conditions, correct? There is no "enclosing plate" at this point.

You can also ignore the latter part involving absorbed radiation for now. It isn't really relevant to anything I am doing at this time.

It would seem that the next logical step would be to calculate the net power loss of the heat source to its surroundings under these conditions, applying the Stefan-Boltzmann law directly. Using the same variable names I used earlier:

power = (se) * radiating area * (T(s)^4 - T(w)^4) = (se) * 510.065 * (338.71^4 - 255.37^4) =

(6.24 * 10^09 W) / (m^2 *K^4) * 510.065 * (13,161,702,663.0 - 4,252,844,523.22) = 28387.68 W
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-06 20:37 (#47844147) Homepage Journal
And the next step is...?
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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-06 20:49 (#47844207)
No, I have no intention of finishing today. I am busy and I have been putting in what little time I have had to "spare".

Please explain why conductivity is relevant. We are examining the system in steady-state.

The plate is inserted into the system colder than the heat source (Spencer's stipulation).
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

  by khayman80 (824400) on 2014-09-06 21:05 (#47844289) Homepage Journal
  Finite conductivity is relevant because Jane's previously objected to thermal superconductors. But that doesn't apply to the next step, which is simply calculating the enclosing shell's final outer steady-state temperature once it's added.
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  - **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

    by Jane Q. Public (1010737) Friend of a Friend on 2014-09-06 21:22 (#47844347)
    I objected to thermal superconductors because they led to contradiction.

    I am curious: how do you propose to calculate the outer temperature first?
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    - **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

      by khayman80 (824400) on 2014-09-06 21:30 (#47844387) Homepage Journal

      So finite conductivity is relevant.

      We need two constants to calculate the outer shell temperature. The chamber walls are held at 0F, which is one constant. The electrical power heating the source is another constant. At the original steady-state without the shell, the net radiative power leaving the source equals the constant electrical power heating the source. This constant power doesn't change even after the shell is inserted.

      Given these two constants, we can solve for the enclosing shell's outer temperature once it reaches steady-state.

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      - **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

        by Jane Q. Public (1010737) Friend of a Friend on 2014-09-06 21:56 (#47844481)
        So you object to calculating heat transfer via radiation by using radiative transfer equations?

By the way: upon looking at the situation more closely, I found that applying the S-B law directly does not apply in this exact situation. (I looked because it gave a much different answer than the one I had already calculated.) It applies when a body is radiating to its ambient surroundings, not between two bodies. (We don't have "ambient" surroundings per se... just vacuum between 2 bodies.)

My first method of calculating the heat transferred was the correct one: ((epsilon) * (sigma) * T(s)^4 * Area(s)) - ((epsilon) * (sigma) * T(w)^4 * Area(w))

Factoring out (es) you get (T(s)^4 * Area(s)) - (T(w)^4 * Area(w)), which only holds of course when e = a.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-06 22:02 (#47844493)

At the original steady-state without the shell, the net radiative power leaving the source equals the constant electrical power heating the source. This constant power doesn't change even after the shell is inserted.

Yes, this was one of the reasons I took the time to calculate the irradiance = radiative power output / m^2.

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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-06 22:03 (#47844501) Homepage Journal

I've always been calculating heat transfer via radiation by using radiative transfer equations.

Again, the next step is calculating the enclosing shell's final outer steady-state temperature once it's added. Since I've already done this, would you like to me repeat my answer, or would you like to be brave and show your calculation?

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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-06 23:21 (#47844633) Homepage Journal

Once it reaches steady-state, the enclosing shell radiates the same power out as the heated plate did before it was enclosed. But its area is 1.0025 times larger, so its outer temperature is 149.6F (338.5K) instead of 150.0F (338.7K):

A_h*T_h^4 = A_c2*T_c2^4 (Eq. 3)

Again, a more accurate answer can be obtained using Wikipedia's equation

#Calculate outer temperature of enclosing shell. var('sigma T_c T_h A_c A_h F_hc power epsilon_h epsilon_c') eq1 = power == sigma*(T_h^4 - T_c^4)/((1-epsilon_h) /(epsilon_h*A_h) + 1/(A_h*F_hc) + (1-epsilon_c)/(epsilon_c*A_c)) soln2 = solve(eq1.subs(T_c=255.372,sigma=5.670373E-8, epsilon_h=0.11, epsilon_c=0.11, F_hc=1, A_h=511.346241712453,

A_c=512.469109758699,power=15028.4258648090),T_h) soln2[0].rhs().n()
ANSWER: 338.629792627809

This is 149.9F, which shows that my simpler method of accounting for the area ratio underestimated the shell's outer steady-state temperature by ~0.3F.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-06 23:24 (#47844641) Homepage Journal

(Fixed formatting.)

Once it reaches steady-state, the enclosing shell radiates the same power out as the heated plate did before it was enclosed. But its area is 1.0025 times larger, so its outer temperature is 149.6F (338.5K) instead of 150.0F (338.7K):

A_h*T_h^4 = A_c2*T_c2^4 (Eq. 3)

Again, a more accurate answer can be obtained using Wikipedia's equation

#Calculate outer temperature of enclosing shell.
var('sigma T_c T_h A_c A_h F_hc power epsilon_h epsilon_c')
eq1 = power == sigma*(T_h^4 - T_c^4)/((1-epsilon_h)/(epsilon_h*A_h) + 1/(A_h*F_hc) + (1-epsilon_c)/(epsilon_c*A_c))
soln2 = solve(eq1.subs(T_c=255.372,sigma=5.670373E-8, epsilon_h=0.11, epsilon_c=0.11, F_hc=1, A_h=511.346241712453, A_c=512.469109758699,power=15028.4258648090),T_h)
soln2[0].rhs().n()

ANSWER: 338.629792627809

This is 149.9F, which shows that my simpler method of accounting for the area ratio underestimated the shell's outer steady-state temperature by ~0.3F.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-07 13:15 (#47847967) Homepage Journal

Now to calculate the enclosing shell's inner temperature. At steady-state, power in = power out through some boundary. This time, draw the boundary **within** the enclosing shell. Again, constant electrical power flows in. But all the other boundaries we drew were in vacuum, so heat transfer was by radiation. This time the boundary is inside aluminum, so heat transfer out is by thermal conduction.

electricity = k*(T_h - T_c)/x (Eq. 4)

The shell's thickness "x" is 1mm, and the thermal conductivity "k" of aluminum is 215 W/(m*K). We just found that:

Outer shell temperature: 338.629792627809 K (149.864 F).

So:

Inner shell temperature: 338.629929668632 K (149.864 F).

Of course, that's a flat plate approximation of heat conduction through a spherical shell, which is derived here. That more accurate equation yields:

#Calculate enclosing shell's inner temperature.
var('T_c T_h power k r_c1 r_c2')
eq2 = power == 4*pi*k*r_c1*r_c2*(T_h - T_c)/(r_c2 - r_c1)
soln3 =
solve(eq2.subs(T_c=338.629792627809,power=15028.4258648090,k=215,r_c1=6.378,
soln3[0].rhs().n()

Inner shell temperature: 338.629929346551 K (149.864 F).

Now for the final step. Calculate the steady-state temperature of the enclosed heated plate (Jane's "source").

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 13:41 (#47848095)
We already know what the radiated power output of the heat source is, given the initial conditions, which I calculated via a far simpler and unambiguous equation which we know to be relevant: (epsilon)(sigma)T^4.

No "electricity" needed. Your "electricity" figure is NOT the "power out" of the heat source. It is a figure for total power consumed that I do not agree applies in this instance, since we have a refrigerator on the outside which also consumes power.

To put it another way, your "electricity" figure is not power output of source it is a figure for a DIFFERENCE, which I do not agree applies in this instance.

Again, using (epsilon)(sigma)T^4:

Radiative emittance of heat source under initial conditions: 82.12 W/m^2

You already agreed with this figure.

Total radiative power out = (82.12 W/m^2) * (510.065 m^2) = 41886.54 W

You are contradicting yourself. Either this is the correct figure, or it is not.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-07 14:07 (#47848227) Homepage Journal

> At the original steady-state without the shell, the net radiative power leaving the source equals the constant electrical power heating the source. This constant power doesn't change even after the shell is inserted.

Yes, this was one of the reasons I took the time to calculate the irradiance = radiative power output / m^2. ***[Jane Q. Public, 2014-09-07]***

I'm glad we agree that at the original steady-state without the shell, the net radiative power leaving the source equals the constant electrical power heating the source.

> ... No "electricity" needed. Your "electricity" figure is NOT the "power out" of the heat source. It is a figure for total power consumed that I do not agree applies in this instance, since we have a refrigerator on the outside which also consumes power. To put it another way, your "electricity" figure is not power output of source it is a figure for a DIFFERENCE, which I do not agree applies in this instance. ... ***[Jane Q. Public, 2014-09-07]***

If we don't need to know how much constant electrical power (total, or the irradiance per square meter) heats the source, why did you take the time to calculate the net irradiance out?

I've repeatedly failed to explain that the power consumed by the refrigerator on the outside is irrelevant. So obviously we'll have to agree to disagree about that.

> ... Radiative emittance of heat source under initial conditions: 82.12 W/m^2. You already agreed with this figure. Total radiative power out = (82.12 W/m^2) * (510.065 m^2) = 41886.54 W. You are contradicting yourself. Either this is the correct figure, or it is not. ... ***[Jane Q. Public, 2014-09-07]***

I've repeatedly agreed that a heated plate (Jane's "source) surrounded by 0K blackbody walls would require 82 W/m^2 to stay at 150F. Jane's agreed that at the original steady-state without the shell, the net radiative power leaving the source equals the constant electrical power heating the source.

That's why no electrical heating power would be necessary to keep a heated plate at 150F if the chamber walls were also at 150F.

Jane, the next step is to calculate the enclosing shell's final outer steady-state temperature once it's added. Did you get a different answer than me?

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 14:12 (#47848263)
Never mind. I will back up on that, at least for now.

If we assume that power output of the exterior surface of the enclosing shell is the same as it was from the heat source under initial conditions (something I am not yet ready to stipulate, since we are not at thermal equilibrium), I calculate a temperature, using my own shown above, at 338.49K.

However, I want to make this clear: I am not convinced that your power in = power out assumption is correct in this case, because we have a refrigerated outer shell, which also consumes power (we do not yet know how much), which keeps things OUT of thermal equilibrium. We are adding power in the center, and we are removing power at the outside. But because of Spencer's conditions, I am not convinced at this point that we can assume power is conserved.

If everything were at thermal equilibrium, I would be convinced. But at the very least, we would have to calculate the difference between power consumed by the refrigerator on the outside, between initial and final conditions. Do we have enough information to do that?

What is the ambient temperature? What is the volume of the chamber wall?
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-07 14:17 (#47848299) Homepage Journal

> ... No "electricity" needed. Your "electricity" figure is NOT the "power out" of the heat source. It is a figure for total power consumed that I do not agree applies in this instance, since we have a refrigerator on the outside which also consumes power. ... ***[Jane Q. Public, 2014-09-07]***
>
> ... I am not convinced that your power in = power out assumption is

> correct in this case, because we have a refrigerated outer shell, which also consumes power (we do not yet know how much), which keeps things OUT of thermal equilibrium. We are adding power in the center, and we are removing power at the outside. But because of Spencer's conditions, I am not convinced at this point that we can assume power is conserved. If everything were at thermal equilibrium, I would be convinced. But at the very least, we would have to calculate the difference between power consumed by the refrigerator on the outside, between initial and final conditions. Do we have enough information to do that? ... ***[Jane Q. Public, 2014-09-07]***

Energy is always conserved. A boundary drawn around a system that isn't changing always has power in = power out. Always. Because energy is always conserved.

Once again, I've repeatedly failed to explain that the power consumed by the refrigerator on the outside is irrelevant. So obviously we'll have to agree to disagree about that.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 14:43 (#47848419)

Energy is always conserved.

Of course it is.

Let me rephrase what I was saying: at least theoretically, the power at the chamber wall is allowed to vary, in order to keep the temperature at 0 degrees F.

But, if we draw a boundary around the system, and assume that the ONLY power in is what we put in, and the ONLY power out is what is removed, then of course it must be conserved.

I was simply expressing my concern that your electricity figure may not be properly observing those boundaries. If your electricity figure is simply power in - power out, I fail to see why you need to calculate it in such a fashion. I think it is an unnecessary complication and potential source of error.

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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-07 14:48 (#47848445) Homepage Journal
If it's an unnecessary complication, it should be easy to show the simpler method. If it's a potential source of error, please quantify that error by taking the next step: calculating the enclosing shell's final outer steady-state temperature once it's added. Did you get a different answer than me?
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-07 15:12 (#47848583) Homepage Journal

> A boundary drawn around a system that isn't changing always

> has power in = power out. Always. Because energy is always conserved.
>
> ... Let me rephrase what I was saying: at least theoretically, the power at the chamber wall is allowed to vary, in order to keep the temperature at 0 degrees F. But, if we draw a boundary around the system, and assume that the ONLY power in is what we put in, and the ONLY power out is what is removed, then of course it must be conserved. I was simply expressing my concern that your electricity figure may not be properly observing those boundaries. If your electricity figure is simply power in - power out... ***[Jane Q. Public, 2014-09-07]***

Maybe this will help. It seems like Jane might think I meant power in = electrical heating power, and power out = cooling power of the chamber walls.

If so, that's not what I meant, and I'm sorry for not being more clear. I take full responsibility.

Just to be clear, power in = power flowing **into** the boundary in question, and power in = power flowing **out** of that boundary.

In my opinion, solving thermodynamics problems is mostly about choosing the most informative boundaries, then calculating steady-state solutions by setting power in = power out through that boundary.

From the start, the largest boundary I drew was "just inside the chamber walls" so the chamber walls and the cooler have always been outside all the boundaries. That means any power used by the cooler is simply being moved from some point outside the boundary to another point which is **also** outside the boundary. Because that power never crosses the boundary, it's irrelevant.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-07 15:18 (#47848609) Homepage Journal

ACK! SORRY! Just to be clear, power in = power flowing **into** the boundary in question, and power out = power flowing **out** of that boundary.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 17:00 (#47849063)
Perhaps it would be more informative if you calculate ENERGY in and ENERGY out, since that is what is actually conserved.

You seem to keep forgetting that (A) power is a RATE, not a unit of energy, and (B) we are not at thermal equilibrium.

Classical example from Wikipedia: running up the stairs requires more power than walking up the stairs, because more energy is expended per unit time. (Granted, the time period is also shortened, but it still illustrates that they are not the same.)

Let me give you a physics example: We have a gray-body hemisphere, emissivity 0.5, with radius of the flat surface 1.00 m and temperature T of 200K. We do NOT assume thermal equilibrium.

The area of the curved part is 6.28 m^2, of the flat part is pi, so the total area is 9.42 m^2.

We have incident radiation hitting the flat surface of 229.64 W/m^2. (We draw a "boundary" around our hemisphere, so that is our "system", and the incident radiation is the only "power" input.)

Our total input -- our ONLY power input -- is 229.64 W/m^2 * pi = 721.44 W.

Total amount **absorbed** = 721.44 * 0.5 = 360.72 W.

Emittance is 0.5 * sigma * T^4 = 0.5 * 5.67 * 10^-8 * 1600000000 = 45.36 W/m^2

Total power **output** in this case is emittance + unabsorbed incident radiation, which would normally be "radiosity", except radiation is only being absorbed on one surface. (I.e., our "view factor" F is only 1/3.)

Since emissivity = 0.5, total "reflected" (i.e. unabsorbed) radiation is 360.7 W

Total power out then is 45.36 W/m^2 * 9.42 m^2 = 427.29 W + 360.72 W = 788.01 W.

788.01 W != 721.44 W (!!!) Power is not conserved.

Obviously this does not represent radiative steady-state.

Now let's take an even simpler example: a black body sphere of surface area 1 m^2 inside a spherical "black body cavity" with area of 2 m^2, **at thermal equilibrium**.

Obviously, since **radiative power** = (epsilon)(sigma)T^4, both surfaces are radiating the same power in W/m^2.

However, the inner surface of the cavity has twice as much area, so the **total power radiated** is twice as much. Power is not conserved.

If you tried to argue that the increased power would warm up the interior sphere, then you're no longer in thermal equilibrium.

So... are you suggesting that if I hollowed out enough of a mountain to make a hollow rock sphere (assume the rock is diffuse gray body) 1000 m diameter, suspended a 1m dia. sphere of the same rock in the center, and evacuated the cavity: the inner sphere is going to get much hotter than the surrounding rock?

Power in = power out would seem to demand that very thing.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 17:04 (#47849079)
Correction to one of the equations above. Total power out then is (45.36 W/m^2 * 9.42 m^2 = 427.29 W) + 360.72 W = 788.01 W.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 17:18 (#47849157)
No, before you jump all over my black body example, I am aware that view factor has to be taken into account.

But that is actually part of my point: a simple power-in = power-out view is not always the right answer.

It is true that the interior of the cavity is radiating twice as much power out. There is a view factor involved, which may account for the difference. But **the view factor does not involve power output** of the radiating body. We know what that is. Much of it is being re-absorbed by the interior of the cavity, true. But it shows how power-in = power-out calculations can easily mislead.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 17:24 (#47849195)

Further, the above example of the black body suspended in the black-body cavity at thermal equilibrium shows why your "conservation of energy just inside the heated plate surface" is more complex than you make it out to be.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 19:28 (#47849701)

I will do you a favor here, and say: don't bother to go calculating the energy, either.

The problem is that an analysis of this kind, **based on** the assumption that power-in = power-out, is doomed to fail except in coincidental cases. Even conservation of energy can give very misleading results.

The black body example I gave shows why your "energy conservation just inside the surface" won't work. Aside from just "view factor" and a few other things, a certain amount of the power in (often a very significant amount) just ends up going right back out, but you often don't see that in the formulas.

Quote from one of my references, "Fundamentals of Heat and Mass Transfer", by Inropera, et al., 6th edition, 2006, p13. I have to type this in by hand from the book so any typographical errors are mine. Emphasized words have been capitalized.

Relationship to Thermodynamics

At this point it is appropriate to note the fundamental differences between heat transfer and thermodynamics. Although thermodynamics is concerned with the heat interaction and the vital role it plays in the first and second laws, it considers neither the mechanisms that profide for heat exchange nor the methods that exist for computing the RATE of heat exchange. Thermodynamics is concerned with EQUILIBRIUM states of matter, where an equilibrium state necessarily precludes the existence of a temperature gradient. Although thermodynamics may be used to determine the amount of energy required in the form of heat to pass from one equilibrium state to another, it does not acknowledge that HEAT TRANSFER IS INHERENTLY A NONEQUILIBRIUM PROCESS. For heat transfer to occur, there must be a temperature gradient and, hence, thermodynamic nonequilibrium. The discipline of heat transfer therefore seeks to do what thermodynamics is inherently unable to do, namely, to quantify the RATE at which heat transfer occurs in terms of the degree of thermal nonequilibrium. This is done via the rate equations for the three modes ...

Heat transfer requires a temperature gradient, and therefore thermodynamic non-equilibrium (as we established early on). I was hoping you would catch on that this also implies that power-in = power-out is not necessarily true, and in fact that is probably a very rare exception.

Therefore, you aren't going to prove anything with this approach. I wanted to stop you before you wasted more of your time.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-07 19:59 (#47849813) Homepage Journal

> Once again, energy is conserved, which means that if you draw a boundary around some system (like the heated plate), power going in minus power going out equals the rate at which energy inside that boundary changes. At steady-state, that rate is zero because the system doesn't change. So at steady-state, power in = power out.

> Perhaps it would be more informative if you calculate ENERGY in and ENERGY out, since that is what is actually conserved. You seem to keep forgetting that (A) power is a RATE, not a unit of energy, and (B) we are not at thermal equilibrium. ... ***[Jane Q. Public, 2014-09-07]***

No. Once again, I said that power going in minus power going out equals the **rate** at which energy inside that boundary changes. Once again, that **rate** is zero if the system doesn't change.

> ... are you suggesting that if I hollowed out enough of a mountain to make a hollow rock sphere (assume the rock is diffuse gray body) 1000 m diameter, suspended a 1m dia. sphere of the same rock in the center, and evacuated the cavity: the inner sphere is going to get much hotter than the surrounding rock? Power in = power out would seem to demand that very thing. ***[Jane Q. Public, 2014-09-07]***

No. I've repeatedly told you that power in = power out demands that an unheated inner sphere will be at exactly the same temperature as the chamber walls.

> ... I am aware that view factor has to be taken into account. ... ***[Jane Q. Public, 2014-09-07]***

Using what equation? A month ago I said we could use Wikipedia's equation which includes areas, and later mentioned view factors. I've been using this equation to calculate the net heat transfer between the heated plate (Jane's "source") and the chamber walls.

If that's the equation Jane is thinking about using to take account of the view factor, Jane should ponder what happens in that equation when the two temperatures in that equation are equal. As I've repeatedly said, the net heat transfer goes to zero when the two temperatures are equal. Regardless of their areas.

> ... 788.01 W != 721.44 W (!!!) Power is not conserved. ... Power is not conserved. ***[Jane Q. Public, 2014-09-07]***

> ... a simple power-in = power-out view is not always the right answer. ... it shows how power-in = power-out calculations can easily mislead. ***[Jane Q. Public, 2014-09-07]***

> ... The black body example I gave shows why your "energy conservation just inside the surface" won't work. Aside from just "view factor" and a few other things, a certain amount of the power in (often a very significant amount) just ends up going right back out, but you often don't see that in the formulas. ... ***[Jane Q. Public, 2014-09-07]***

No, it shows that Jane's equation doesn't correctly describe net radiative transfer between two surfaces. Once again, Wikipedia's equation correctly takes into account the areas and view factor.

> ... The problem is that an analysis of this kind, **based on** the assumption that power-in = power-out, is doomed to fail except in coincidental cases. Even conservation of energy can give very misleading results. ... power-in = power-out is not necessarily true, and in fact that is probably a very rare exception. Therefore, you aren't going to prove anything with this

> approach. I wanted to stop you before you wasted more of your time.
> ***[Jane Q. Public, 2014-09-07]***

No. Energy is always conserved. A boundary drawn around a system that isn't changing always has power in = power out. Always. Because energy is always conserved.

If power flowing in through a boundary weren't equal to power flowing out of that boundary, the system is either changing or energy isn't conserved. But energy is always conserved. So a boundary drawn around a system that isn't changing always has power in = power out. Always. Because energy is always conserved.

Once again, the next step is calculating the enclosing shell's final outer steady-state temperature once it's added. Did you get a different answer than me?

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 20:58 (#47850021)

No. I've repeatedly told you that power in = power out demands that an unheated inner sphere will be at exactly the same temperature as the chamber walls.

That isn't *quite* what you said. This is what you said:

One way to see this is to consider how much power the electrical heater would need if the chamber walls were also at 150F. The correct answer is zero watts, because the heated plate wouldn't lose net heat to walls at the same temperature. But since your expression doesn't depend on the chamber wall temperature, you wouldn't be able to obtain the correct answer of zero in that case.

I already understand this, and I mentioned it myself in the post above. My point was that it does not translate directly into power in = power out at a boundary just inside the cavity surface. It most certainly does not if the bodies are not in thermal equilibrium, which again I must point out this system is not in. See my reference again. By the way, the author is Incropera, not "Incopora". Slip of the keyboard, there.

As for the rest, I am out of time right now and will reply tomorrow if I have more time.

Just one last closing comment tonight, though: I am aware that energy in a system must be conserved. But "system" is not anywhere you choose to draw a line. In the case of heat transfer, energy does not have to be conserved between two bodies at different temperatures. That was what Incorpora was saying in his book. And that is why I balk at your "conservation of energy just inside the surface".

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 20:59 (#47850029)
Damn. Finger slipped again.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-07 21:16 (#47850115) Homepage Journal

> ... My point was that it does not translate directly into power in = power out at a boundary just inside the cavity surface. It most certainly does not if the bodies are not in thermal equilibrium, which again I must point out this system is not in. ... ***[Jane Q. Public, 2014-09-07]***

It absolutely does translate directly into power in = power out at a boundary just inside the cavity surface **when everything inside that boundary isn't changing**. In that case, the rate at which energy changes inside the boundary equals zero, which means power in = power out.

> ... energy does not have to be conserved between two bodies at different temperatures. That was what Incorpora was saying in his book. ... ***[Jane Q. Public, 2014-09-07]***

No. Energy is always conserved. Always.

Once again, the next step is calculating the enclosing shell's final outer steady-state temperature once it's added. This should have only taken you a few minutes to calculate. Did you get a different answer than me?

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

  by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 22:20 (#47850291)
  The reason my "dirt simple" calculation was wrong, as any reader of this exchange should be able to tell (and so should you have), that I misunderstood what your power figure represented.
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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

  by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 22:29 (#47850327)
  No, of course I got the same answer, given your assumption that power-in = power-out: 149.59F.
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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

  by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 22:31 (#47850339)
  Are you also then presuming that power transferred from the outer surface of the enclosing plate to the chamber walls is the same as the power transferred from the heat source to that plate?
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

  by khayman80 (824400) on 2014-09-07 22:48 (#47850377) Homepage Journal

  > The reason my "dirt simple" calculation was wrong, as any reader of this exchange should be able to tell (and so should you have), that I misunderstood what your power figure represented. ***[Jane Q. Public,***

> > ***2014-09-07]***
>
> I'm very sorry for not being more clear. I take full responsibility.
>
> > > It absolutely does translate directly into power in = power out at a boundary just inside the cavity surface **when everything inside that boundary isn't changing**. In that case, the rate at which energy changes inside the boundary equals zero, which means power in = power out.
> >
> > Are you also then presuming that power transferred from the outer surface of the enclosing plate to the chamber walls is the same as the power transferred from the heat source to that plate? ***[Jane Q. Public, 2014-09-07]***
>
> Anything else would violate conservation of energy. But we still have one more step before the **net** power transferred from the heat source to that enclosing plate becomes relevant.
>
> > No, of course I got the same answer, given your assumption that power-in = power-out: 149.59F. ***[Jane Q. Public, 2014-09-07]***
>
> Excellent. And can we also agree about the enclosing aluminum shell's final inner steady-state temperature?
>
> Now to calculate the enclosing shell's inner temperature. At steady-state, power in = power out through some boundary. This time, draw the boundary **within** the enclosing shell. Again, constant electrical power flows in. But all the other boundaries we drew were in vacuum, so heat transfer was by radiation. This time the boundary is inside aluminum, so heat transfer out is by thermal conduction.
>
> electricity = k*(T_h - T_c)/x (Eq. 4)
>
> The shell's thickness "x" is 1mm, and the thermal conductivity "k" of aluminum is 215 W/(m*K). We just found that:
>
> Outer shell temperature: 338.629792627809 K (149.864 F).
>
> So:
>
> Inner shell temperature: 338.629929668632 K (149.864 F).
>
> Of course, that's a flat plate approximation of heat conduction through a spherical shell, which is derived here. That more accurate equation yields:
>
> #Calculate enclosing shell's inner temperature.
> var('T_c T_h power k r_c1 r_c2')
> eq2 = power == 4*pi*k*r_c1*r_c2*(T_h - T_c)/(r_c2 - r_c1)
> soln3 =
> solve(eq2.subs(T_c=338.629792627809,power=15028.4258648090,k=215,r_c1=6.378,
> soln3[0].rhs().n()
>
> Inner shell temperature: 338.629929346551 K (149.864 F).
>
> Now for the final step. Calculate the steady-state temperature of the enclosed heated plate (Jane's "source").
>
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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 22:52 (#47850383)

No. Energy is always conserved. Always.

Did you actually read what I wrote?

Just no. Energy **of an entire system** is conserved. It need not be conserved between individual elements of that system. That's what I've been saying.

HEAT TRANSFER is expressed in Joules. What it is a Joule? It is a unit of energy.

HEAT TRANSFER is always in one direction. Heat transfer **between two bodies** that are not at thermal equilibrium does not conserve energy **between those two bodies**. On the contrary: it is a flow of energy in one direction. If energy was conserved between those two bodies, then no heat transfer could take place and they must necessarily then be in thermal equilibrium. But the bodies in this system are NOT in thermal equilibrium.

Are you getting that yet?

I did not claim energy was not conserved for the entire system. I claimed only what is obviously true, and what textbook physics tells us is true: heat (energy) transfer between two bodies that are not at thermodynamic equilibrium is not required to conserve energy **between those two bodies**.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 22:54 (#47850385)
And also obviously, I was referring to NET heat transfer.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-07 23:02 (#47850403) Homepage Journal

> ... Energy **of an entire system** is conserved. It need not be conserved between individual elements of that system. That's what I've been saying. ... Heat transfer **between two bodies** that are not at thermal equilibrium does not conserve energy **between those two bodies**. ... ***[Jane Q. Public, 2014-09-07]***

Can we agree that energy conservation means that power going in minus power going out through some boundary equals the rate at which energy inside that boundary changes?

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-07 23:15 (#47850453)
Obviously at radiative equilibrium energy between objects in the system is being transferred at a constant rate.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-07 23:18 (#47850463) Homepage Journal

> Obviously at radiative equilibrium energy between objects in the system is being transferred at a constant rate. ***[Jane Q. Public, 2014-09-07]***

This principle applies even for systems that are changing, and even for systems that aren't in radiative equilibrium.

Again, can we agree that energy conservation means that power going in minus power going out through some boundary equals the rate at which energy inside that boundary changes?

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-08 9:08 (#47853167)
I'm not sure I agree with your wording. It could easily be misinterpreted to mean something it does not.

I agree that power in minus power out of your boundary equals power through that boundary, which at radiative steady-state represents a constant rate of energy flow through that boundary.

Please continue.
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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-08 9:13 (#47853237)
Given your assumptions so far, I will not dispute your calculation of the temperature of the inner surface of the enclosing plate.

Please continue your calculations, as a reply to my other comment, so we can continue this exchange in a linear fashion.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-08 12:31 (#47855197) Homepage Journal

> Given your assumptions so far, I will not dispute your calculation of the temperature of the inner surface of the enclosing plate. Please continue your calculations, as a reply to my other comment, so we can continue this exchange in a linear fashion. ***[Jane Q. Public, 2014-09-08]***

I'm glad you don't dispute the enclosing shell's inner temperature of ~149.9F, but we should agree on my assumption that energy is conserved before proceeding.

> > Can we agree that energy conservation means that power going in minus power going out through some boundary equals the rate at which energy inside that boundary changes?
>
> I'm not sure I agree with your wording. It could easily be misinterpreted to mean something it does not. I agree that power in minus power out of your boundary equals power through that boundary, which at radiative steady-state represents a constant rate of energy flow through that

> boundary. ***[Jane Q. Public, 2014-09-08]***

How could my wording be easily misinterpreted? Once again, this fundamental principle applies even for systems that are changing, and even for systems that aren't at radiative steady-state.

Again, can we agree that energy conservation means that power going in minus power going out through some boundary equals the rate at which energy inside that boundary changes?

Maybe an analogy would help. The rate at which water flows into a bathtub minus the water flowing out equals the rate at which water in the bathtub changes. No qualifications needed.

If we can't agree that energy conservation means that power going in minus power going out through some boundary equals the rate at which energy inside that boundary changes, could you please explain exactly why we can't agree on this?

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-08 13:51 (#47855945)
I prefer my wording, which I think most people would agree is an equivalent statement regarding your drawn boundary, but (in my opinion) is less open to misunderstanding.

I agree that power into your boundary minus power out of your boundary equals the power **through** the boundary, which at radiative equilibrium is equivalent to a constant rate of energy flow through that boundary.

Were you trying to say something else? If not, let's please move on.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-08 14:15 (#47856177) Homepage Journal

> This principle applies even for systems that are changing, and even for systems that aren't in radiative equilibrium. Again, can we agree that energy conservation means that power going in minus power going out through some boundary equals the rate at which energy inside that boundary changes?
>
> How could my wording be easily misinterpreted? Once again, this fundamental principle applies even for systems that are changing, and even for systems that aren't at radiative steady-state.

> I prefer my wording, which I think most people would agree is an equivalent statement regarding your drawn boundary, but (in my opinion) is less open to misunderstanding. I agree that power into your boundary minus power out of your boundary equals the power **through** the boundary, which at radiative equilibrium is equivalent to a constant rate of energy flow through that boundary. Were you trying to say something else? If not, let's please move on. ***[Jane Q. Public, 2014-09-08]***

Once again, this principle applies even for systems that are changing, and even for systems that aren't in radiative equilibrium. Again, that's why I disagree with your claim that:

> ... energy does not have to be conserved between two bodies at different

> temperatures. That was what Incorpora was saying in his book. ... ***[Jane Q. Public, 2014-09-07]***

Since you keep place qualifiers on energy conservation, your wording isn't equivalent to mine because my statement applies even for systems that aren't in radiative equilibrium.

Once again, can we agree that energy conservation means that power going in minus power going out through some boundary equals the rate at which energy inside that boundary changes? Even for systems that are changing? Even for systems that aren't in radiative equilibrium?

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-08 14:35 (#47856411)

Since you keep place qualifiers on energy conservation, your wording isn't equivalent to mine because my statement applies even for systems that aren't in radiative equilibrium.

But that should not matter because we are discussing a system in radiative equilibrium. If it were in disequilibrium, the only change would be the removal of "radiative equilibrium" and the word "constant", since it is radiative equilibrium that forces it to be constant.

I don't necessarily have a problem with a broader definition, but I prefer to stick to things that are pertinent to **this** discussion.

So can we move on?

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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-08 14:55 (#47856649) Homepage Journal

> Since you keep place qualifiers on energy conservation, your wording isn't equivalent to mine because my statement applies even for systems that aren't in radiative equilibrium.
>
> But that should not matter because we are discussing a system in radiative equilibrium. ... ***[Jane Q. Public, 2014-09-08]***

Really? Since when?

> ... There is no thermal equilibrium. Period. None. There MAY (and eventually would) arise a condition of **radiative** equilibrium for the (enclosing, passive, however you want to describe it) plate. But the other objects (heat source and chamber walls) do not meet this criteria because they are heated/cooled by means that may be other than radiative. "The system" is not in radiative equilibrium. ... [Jane Q. Public, 2014-09-03]
>
> ... I don't necessarily have a problem with a broader definition, but I prefer to stick to things that are pertinent to **this** discussion. So can we move on? ***[Jane Q. Public, 2014-09-08]***

Since Jane's insisted that the system is not in radiative equilibrium, it's necessary to agree on a general principle that applies even for systems that aren't in radiative equilibrium. Then we can move on.

> > Can we agree that energy conservation means that power going in minus power going out through some boundary equals the rate at which energy inside that boundary changes?
>
> I'm not sure I agree with your wording. It could easily be misinterpreted to mean something it does not. I agree that power in minus power out of your boundary equals power through that boundary, which at radiative steady-state represents a constant rate of energy flow through that boundary. ***[Jane Q. Public, 2014-09-08]***
>
> I prefer my wording, which I think most people would agree is an equivalent statement regarding your drawn boundary, but (in my opinion) is less open to misunderstanding. I agree that power into your boundary minus power out of your boundary equals the power **through** the boundary, which at radiative equilibrium is equivalent to a constant rate of energy flow through that boundary. ... ***[Jane Q. Public, 2014-09-08]***
>
> ... it is radiative equilibrium that forces it to be constant. ... ***[Jane Q. Public, 2014-09-08]***

Your wording could easily be misinterpreted to mean a constant other than zero. Didn't you mean that net power through that boundary at radiative steady-state represents **zero** energy flow through that boundary? If not, our misunderstanding is much more fundamental than I first thought.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-08 15:54 (#47857255)

But the other objects (heat source and chamber walls) do not meet this criteria because they are heated/cooled by means that may be other than radiative. "The system" is not in radiative equilibrium.

But that should not matter because we are discussing a system in radiative equilibrium.

Really? Since when?

Sigh. We've already had this discussion. That upper quote was from 5 days ago, and we quickly established that it was incorrect. **Since** then, we went on to agree that **at steady-state**, the system is in radiative but not thermal equilibrium. Are you now retracting that agreement? Because there is definitely no thermal equilibrium, and without at least radiative equilibrium, there is no equilibrium at all and we might as well just stop again right here. Here is my later comment, in full:

To be even more clear, because I want to eliminate all misunderstands, this statement that I made above is incorrect:

Great. Except that it doesn't pertain to Spencer's challenge for several reasons. First, the chamber walls in Spencer's experiment are not "empty" space, but a material body that is being actively refrigerated, while the "enclosing passive plate" is being heated on the other side. So that plate is not in radiative equilibrium with the chamber wall or with anything else for that matter. In fact that would be impossible. There are other reasons why that description does not match Spencer's challenge, but that is irrelevant for now. One is enough.

Mea culpa. The outside of the enclosing passive plate would eventually reach radiative equilibrium with the chamber walls. But not thermal equilibrium. Further, the inside of the passive heated plate would reach radiative equilibrium with the heat source. But not thermal equilibrium in that case either. Nor, for that matter, is that same plate in thermal equilibrium even with itself, since realistically its inside and outside surfaces must be at different temperatures, in order to be at radiative equilibrium with those opposing surfaces.

Because I was incorrect to state that there is no radiative equilibrium, I was

incorrect to state that a roughly analogous situation does not apply to Spencer's experiment. The opposing surfaces do reach radiative equilibrium. But it is still not very relevant here, because thermal (and therefore thermodynamic) equilibrium still does not exist.

My comment was in reference to whether this system is in thermal equilibrium, because I claimed (correctly or incorrectly), that Kirchhoff's Law did not apply. You produced a reference that it did apply to gray bodies even if not in thermal equilibrium, so I agreed you could go on with Kirchhoff's Law and see where it led.

So that was the state we were in when we continued: no thermal equilibrium, but I understood that we had agreed that the hollow spherical passive plate must be in radiative equilibrium with its surroundings, since there is no other input or output allowed.

Your wording could easily be misinterpreted to mean a constant other than zero. Didn't you mean that net power through that boundary at radiative steady-state represents zero energy flow through that boundary? If not, our misunderstanding is much more fundamental than I first thought.

No, I very definitely did NOT mean net power at radiative steady-state represents zero energy flow. There is **heat transfer** which is energy, which represents NET flow in one direction. That's what heat transfer is: an energy IMBALANCE, which means non-zero.

Example 1: If you draw a boundary around the burner of a gas furnace, inside the colder walls of the furnace, the RADIANT energy flow into and out of that boundary is NOT a net zero. It is definitely a positive number, from burner across the boundary to the wall. That energy is **heat transfer** .

However: there IS potential energy being supplied to the burner in the form of gas and oxygen. In that view, yes, there is a net zero flow of energy into and out of the burner! No problem.

Example 2: Now consider our system under discussion: there is a hollow sphere between the heat source and the chamber wall. If you draw a spherical boundary between the outer surface of that plate and the chamber wall, since they are at different temperatures, there IS a **net, non-zero flow of energy** (heat transfer) THROUGH that boundary in one direction from the hollow enclosing plate to the chamber wall. This is a net, non-zero quantity.

I reference again the quote from Incropera I posted above, and my own comment accompanying it: while energy of a system must be conserved, in steady state where there is NOT a thermal equilibrium, energy **between two bodies** within that system is not necessarily conserved, because there is a NET energy flow from the warmer one to the cooler one. This flow is called heat transfer, and its instantaneous value is expressed as energy in Joules.

The only time you are allowed to generalize no net, one-directional energy transfer between bodies with nothing between them is when they are at thermal equilibrium.

We've been over this before. I haven't changed anything.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-08 16:02 (#47857337) Homepage Journal

> ... there is definitely no thermal equilibrium, and without at least radiative equilibrium, there is no equilibrium at all and we might as well just stop again right here. ... no thermal equilibrium ... ***[Jane Q. Public, 2014-09-08]***

That's why I'm trying to see if we can agree on a general principle that applies even to

systems that aren't in thermal equilibrium.

> ... why the hell are you trying to blame me for being confused? The condition you described is impossible, so how do you expect me to know what "equilibrium" you mean? ... ***[Jane Q. Public, 2014-09-04]***

Since we've had to agree to disagree about the definition of the term "equilibrium" (whether radiative or thermal), it's necessary to agree on the fundamental principle of energy conservation using a simple statement that doesn't use the term "equilibrium" (of any kind).

> ... I very definitely did NOT mean net power at radiative steady-state represents zero energy flow. ... ***[Jane Q. Public, 2014-09-08]***

Then our statements aren't equivalent, which means there's an innocent misunderstanding here. To help resolve this miscommunication, could we please agree on a general principle that applies to all systems, even if they're not in thermal or radiative equilibrium?

Once again, can we agree that energy conservation means that power going in minus power going out through some boundary equals the rate at which energy inside that boundary changes?

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-08 16:03 (#47857347)
Now, again in the interest of avoiding misunderstanding:

In our system, there IS input to the heat source, which obviously must come from outside. And in that sense (much like the gas burner), it is relevant to say that the net energy flow through that boundary is zero. I certainly do agree with that.

But that was the whole **point** of my attempts to word things precisely: so that this kind of misunderstanding does not arise.

If you meant zero net energy across your boundary, including the power input to the heat source, then yes of course I agree that the net must be zero. At steady-state, you won't be putting more out than you put in, or vice versa.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-08 16:09 (#47857399) Homepage Journal

> ... there is definitely no thermal equilibrium, and without at least radiative equilibrium, there is no equilibrium at all and we might as well just stop again right here. ... no thermal equilibrium ... ***[Jane Q. Public, 2014-09-08]***

That's why I'm trying to see if we can agree on a general principle that applies even to systems that aren't in thermal equilibrium.

> ... why the hell are you trying to blame me for being confused? The condition you described is impossible, so how do you expect me to know what "equilibrium" you mean? ... ***[Jane Q. Public, 2014-09-04]***

Since we've had to agree to disagree about the definition of the term "equilibrium" (whether radiative or thermal), it's necessary to agree on the fundamental principle of energy conservation using a simple statement that doesn't use the term "equilibrium"

(of any kind).

> ... I very definitely did NOT mean net power at radiative steady-state represents zero energy flow. ... ***[Jane Q. Public, 2014-09-08]***

Then our statements aren't equivalent, which means there's an innocent misunderstanding here. To help resolve this miscommunication, could we please agree on a general principle that applies to all systems, even if they're not in thermal or radiative equilibrium?

Once again, can we agree that energy conservation means that power going in minus power going out through some boundary equals the rate at which energy inside that boundary changes?

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-08 16:48 (#47857763)

Since we've had to agree to disagree about the definition of the term "equilibrium" (whether radiative or thermal), it's necessary to agree on the fundamental principle of energy conservation using a simple statement that doesn't use the term "equilibrium" (of any kind).

Wait. Are you claiming that the enclosing hollow sphere is NOT at radiative equilibrium with its surroundings?

The only input and output are radiation, and it is at steady-state.

But I have already agreed, at least in principle, that as long as you are including energy in via "electricity" or whatever is heating the heat source, then your definition of "net zero across the boundary" should apply.

I did not realize you intended to include that figure. I thought you were attempting to say that there was no net energy transfer between the bodies.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-08 17:08 (#47857895) Homepage Journal

> Since we've had to agree to disagree about the definition of the term "equilibrium" (whether radiative or thermal), it's necessary to agree on the fundamental principle of energy conservation using a simple statement that doesn't use the term "equilibrium" (of any kind).
>
> Wait. Are you claiming that the enclosing hollow sphere is NOT at radiative equilibrium with its surroundings? ***[Jane Q. Public, 2014-09-08]***

No. I'm saying that since we've had to agree to disagree about the definition of the term "equilibrium" (whether radiative or thermal), it's necessary to agree on the fundamental principle of energy conservation using a simple statement that doesn't use the term "equilibrium" (of any kind).

Once again, can we agree that energy conservation means that power going in minus power going out through some boundary equals the rate at which energy inside that boundary changes?

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-08 17:26 (#47858003)
On general principle, yes. When all factors are considered, this is true. I haven't disagreed with this general principle, and at this point I'm only really interested in seeing the rest of your calculations. Please explain what calculations you are using where, because I find it hard to tell the Sage-formatted calculations apart.

Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-08 17:30 (#47858045) Homepage Journal

> On general principle, yes. When all factors are considered, this is true. I haven't disagreed with this general principle, and at this point I'm only really interested in seeing the rest of your calculations. Please explain what calculations you are using where, because I find it hard to tell the Sage-formatted calculations apart. ***[Jane Q. Public, 2014-09-08]***

In order to explain what calculations I'm using, we have to first agree on the fundamental principle all my calculations are based on.

I'm glad we agree that power going in minus power going out through some boundary equals the rate at which energy inside that boundary changes.

Notice that this general principle applies to all systems, even if they're at different temperatures or out of (thermal/radiative) equilibrium.

Now suppose that nothing inside that boundary is changing with time. Since this includes the energy inside that boundary, the rate at which energy inside the boundary changes is zero. This means power in = power out through any boundary where nothing inside that boundary is changing with time.

If we can agree so far, just say "yes" and ignore the rest of this comment. Then we can move on to the final step, which is calculating the enclosed source temperature.

If we can't agree, here's why we first need to agree that power in = power out through any boundary where nothing inside that boundary is changing with time.

> ... a simple power-in = power-out view is not always the right answer. ... it shows how power-in = power-out calculations can easily mislead. ***[Jane Q. Public, 2014-09-07]***
>
> ... your "energy conservation just inside the surface" won't work. ... ***[Jane Q. Public, 2014-09-07]***

How could it mislead? Why won't it work? As long as nothing inside the boundary is changing, a simple power in = power out view is **always** the right answer.

> ... The problem is that an analysis of this kind, **based on** the assumption that power-in = power-out, is doomed to fail except in coincidental cases. Even conservation of energy can give very misleading results. ... power-in = power-out is not necessarily true, and in fact that is probably a very rare exception. Therefore, you aren't going to prove anything with this approach. I wanted to stop you before you wasted more of your time. ***[Jane Q. Public, 2014-09-07]***

How is it doomed to fail? How could it give very misleading results? As long as nothing inside the boundary is changing, power in = power out is necessarily true.

> ... it does not translate directly into power in = power out at a boundary

> just inside the cavity surface. It most certainly does not if the bodies are not in thermal equilibrium, which again I must point out this system is not in. ... ***[Jane Q. Public, 2014-09-07]***

No, energy is conserved even when the bodies aren't in thermal equilibrium. As long as nothing inside the boundary is changing, power in = power out.

> ... energy does not have to be conserved between two bodies at different temperatures. That was what Incorpora was saying in his book. ... ***[Jane Q. Public, 2014-09-07]***

No, energy is conserved even between two bodies at different temperatures. As long as nothing inside the boundary is changing, power in = power out.

Can we agree that power in = power out through any boundary where nothing inside that boundary is changing with time? If so, then let's move on to the final step. Calculate the enclosed source temperature.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-08 19:35 (#47858709)

No, energy is conserved even when the bodies aren't in thermal equilibrium. As long as nothing inside the boundary is changing, power in = power out.

That wasn't what I was saying. But never mind, because it is just a misunderstanding, and it's really irrelevant at this point.

As I said before, this is a general principle which is true.

I don't know what more you want.

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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-08 19:39 (#47858733) Homepage Journal

Now that we've agreed on the inner shell temperature of ~149.9F, let's take the last step. Calculate the enclosed source temperature.

Draw a boundary just inside the inner surface of the enclosing shell. Because nothing in the boundary is changing with time, power in = power out. The same constant electrical power flows in as before the shell was added. Net radiative power flows out from the source to the enclosing shell's inner surface.

As before, that net radiative power is described by Wikipedia's equation which accounts for areas and view factors.

#Completely surrounded by shell with finite conductivity.
var('sigma T_c T_h A_c A_h F_hc power epsilon_h epsilon_c')
eq1 = power == sigma*(T_h^4 - T_c^4)/((1-epsilon_h)/(epsilon_h*A_h) + 1/(A_h*F_hc) + (1-epsilon_c)/(epsilon_c*A_c))
soln4 =
solve(eq1.subs(T_c=338.629929346551,power=15028.4258648090,sigma=5.670373e-8,epsilon_h=0.11,epsilon_c=0.11, F_hc=1, A_h=510.064471909788, A_c=511.185932522526),T_h)
soln4[0].rhs().n()

> ... Please explain what calculations you are using where, because I find it

> hard to tell the Sage-formatted calculations apart. ***[Jane Q. Public, 2014-09-08]***

The first line "var('sigma..." declares my variables.
The line "eq1 = power == sigma..." is my "power in = power out" equation using Wikipedia's equation for net radiative power.
The next line plugs in all the relevant variables and solves it for the enclosed source temperature T_h.
The last line displays the answer.

So I've described my method for calculating the enclosed source temperature from start to finish. Before I post that final answer, can we agree with my method? If not, could you please describe your method?

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-08 22:32 (#47859433)
I don't see why you keep asking if I agree with your methods.

I wanted to reach agreement **on the nature of the problem**, to make sure we had it defined clearly.

But as far as I am concerned, pretty much everything beyond that is just your explanation of how you do it.

I *do* want and appreciate explanation. Don't misunderstand me there. But you said your purpose here was to explain something to me. So please, by all means, proceed with the explanation.

I likely won't have opportunity to see it until tomorrow sometime at the earliest, though.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-08 22:39 (#47859461) Homepage Journal

Now that we've agreed on the inner shell temperature of ~149.9F, let's take the last step. Calculate the enclosed source temperature.

Draw a boundary just inside the inner surface of the enclosing shell. Because nothing in the boundary is changing with time, power in = power out. The same constant electrical power flows in as before the shell was added. Net radiative power flows out from the source to the enclosing shell's inner surface.

As before, that net radiative power is described by Wikipedia's equation which accounts for areas and view factors.

```
#Completely surrounded by shell with finite conductivity.
var('sigma T_c T_h A_c A_h F_hc power epsilon_h epsilon_c')
eq1 = power == sigma*(T_h^4 - T_c^4)/((1-epsilon_h)/(epsilon_h*A_h) +
1/(A_h*F_hc) + (1-epsilon_c)/(epsilon_c*A_c))
soln4 =
solve(eq1.subs(T_c=338.629929346551,power=15028.4258648090,sigma=5.670373e-
8,epsilon_h=0.11,epsilon_c=0.11, F_hc=1, A_h=510.064471909788,
A_c=511.185932522526),T_h)
soln4[0].rhs().n()
```

> ... Please explain what calculations you are using where, because I find it

> hard to tell the Sage-formatted calculations apart. ***[Jane Q. Public, 2014-09-08]***

The first line "var('sigma..." declares my variables.
The line "eq1 = power == sigma..." is my "power in = power out" equation using Wikipedia's equation for net radiative power.
The next line plugs in all the relevant variables and solves it for the enclosed source temperature T_h.
The last line displays the answer.

> ... I don't see why you keep asking if I agree with your methods. ... ***[Jane Q. Public, 2014-09-08]***

Because you've seemed to disagree with my method. That's why I've described my method for calculating the enclosed source temperature from start to finish. Before I post that final answer, can we agree with my method? If not, could you please describe your method?

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-08 22:54 (#47859497)
I haven't even tried to calculate an answer yet.

I won't know if I agree with your method until I see it.
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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-08 22:56 (#47859505)
In action, that is.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-09 1:12 (#47859973) Homepage Journal

> I haven't even tried to calculate an answer yet. I won't know if I agree with your method until I see it. In action, that is. ***[Jane Q. Public, 2014-09-08]***

Once again, you've already seen my method. I just described my entire method start to finish **once again** because that's what you demanded:

> ... Create a realistic scenario, draw yourself a diagram, and run some actual numbers on them rather than just tossing equations around without seeing how they fit together in the real world. ... ***[Jane Q. Public, 2014-08-29]***
>
> See? Same shit different day. You won't sit down and do the calculations start-to-finish, instead you do one small part, then start indulging in your hallmark game of out-of-context he-said, she-said, toss in a straw-man, then claim it's all proved. ... It's simply another illustration of the depths of hand-waving you will go to, rather than actually doing all the calculations on the actual experiment from start to finish. All you're doing is tossing in

> more straw-men and irrelevancies. You won't do the actual experiment. The only reasonable conclusion to be drawn here is that you won't do it because you know you're wrong. ***[Jane Q. Public, 2014-08-30]***

I was worried that Jane was just trolling, and had no intention of ever acknowledging my method even if I described them from start-to-finish. Now that I've described my method from start-to-finish and Jane is pretending that he hasn't seen my method "in action" it seems like my worries came true.

Jane, if you won't do a single, solitary calculation of your own, could you at least please stop pretending that you haven't seen my method from start to finish? Here's my last step again:

Now that we've agreed on the inner shell temperature of ~149.9F, let's take the last step. Calculate the enclosed source temperature.

Draw a boundary just inside the inner surface of the enclosing shell. Because nothing in the boundary is changing with time, power in = power out. The same constant electrical power flows in as before the shell was added. Net radiative power flows out from the source to the enclosing shell's inner surface.

As before, that net radiative power is described by Wikipedia's equation which accounts for areas and view factors.

```
#Completely surrounded by shell with finite conductivity.
var('sigma T_c T_h A_c A_h F_hc power epsilon_h epsilon_c')
eq1 = power == sigma*(T_h^4 - T_c^4)/((1-epsilon_h)/(epsilon_h*A_h) +
1/(A_h*F_hc) + (1-epsilon_c)/(epsilon_c*A_c))
soln4 =
solve(eq1.subs(T_c=338.629929346551,power=15028.4258648090,sigma=5.670373e-
8,epsilon_h=0.11,epsilon_c=0.11, F_hc=1, A_h=510.064471909788,
A_c=511.185932522526),T_h)
soln4[0].rhs().n()
```

> ... Please explain what calculations you are using where, because I find it hard to tell the Sage-formatted calculations apart. ***[Jane Q. Public, 2014-09-08]***

The first line "var('sigma..." declares my variables.
The line "eq1 = power == sigma..." is my "power in = power out" equation using Wikipedia's equation for net radiative power.
The next line plugs in all the relevant variables and solves it for the enclosed source temperature T_h.
The last line displays the answer.

So I've described my method for calculating the enclosed source temperature from start to finish. Before I post that final answer, can we agree with my method? If not, could you please describe your method?

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-09 11:51 (#47864509)

I was worried that Jane was just trolling, and had no intention of ever acknowledging my method even if I described them from start-to-finish. Now that I've described my method from start-to-finish and Jane is pretending that he hasn't seen my method "in action" it seems like my worries came true.

I'm not pretending anything. Where is your method in action? Is there an answer in there somewhere? You told me you were going to calculate the temperature of the heat source at steady-state.

This is utter nonsense. I simply asked you for an explanation of how you calculated the figure you stated (long) before, after we agreed on the nature of the problem and

the initial conditions.

Your methodology does does not require my approval in order to explain it. It's either your methodology, or it's not. If you were writing a paper about it, would you ask people who had never seen the problem before for your approval before publishing it? If you had the courage of your conviction, that is, and felt it was the correct solution.

Jane, if you won't do a single, solitary calculation of your own, could you at least please stop pretending that you haven't seen my method from start to finish? Here's my last step again:

STOP attempting to put words in my mouth! This is worse than an obnoxious habit of yours, it is a form of lying.

It is obvious that I **have** done calculations. I merely stated that I haven't calculated a solution yet. And THAT is largely due to what I clearly stated before: I have been busy, and don't have a lot of time to devote to this right now. I've been trying to squeeze in what I could, around work and other obligations.

You've been bugging me for a **very** long time now about this, and this was supposed to be YOUR EXPLANATION of how this works TO ME. So I have been waiting to see it completed. You have no reason to complain about whether I "agree" with your methodology. Either your analysis stands on its own, or it does not.

I have explained several times now that these Sage equations are not exactly straightforward and easy to read. I have been doing my own calculations in a clear and straightforward manner, making them as easy to read as possible. You really expect me to read this stuff?

The last line displays the answer.

Where? The "answer" being the temperature of the heat source at steady-state, which you said you would calculate? I don't see it.

Again, there appears to be a misunderstanding somewhere. I don't know where it is.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-09 12:14 (#47864779) Homepage Journal

> ... Where is your method in action? Is there an answer in there somewhere? You told me you were going to calculate the temperature of the heat source at steady-state. This is utter nonsense. I simply asked you for an explanation of how you calculated the figure you stated (long) before, after we agreed on the nature of the problem and the initial conditions. ... ***[Jane Q. Public, 2014-09-08]***

Once again, you've seen my method in action from start to finish. I've repeatedly asked if we can agree on that method before posting my final numerical answer. That's because I think you deserve a chance to show that you're capable of judging my method based on its physics, as opposed to reflexively objecting if my numerical answer contradicts the PSI Sky Dragon Slayers.

> I haven't even tried to calculate an answer yet. I won't know if I agree with your method until I see it. In action, that is. ***[Jane Q. Public, 2014-09-08]***

You've seen my method from start to finish. If you're capable of judging my method based on its physics, why won't you know if you agree with my method until you see my final numerical answer? For instance, suppose I told you that my final numerical answer agrees with the PSI Sky Dragon Slayers. Would that make you agree with my method's physics? In that case, would you really be agreeing with my method, or agreeing with the answer you want to hear?

If you won't know if you agree with my method until you see my final numerical answer, you're depriving yourself of this chance to demonstrate your intellectual integrity.

Alternatively, you could finally explain your own method of solving for the enclosed source temperature.

> ... I haven't calculated a solution yet. And THAT is largely due to what I clearly stated before: I have been busy, and don't have a lot of time to devote to this right now. I've been trying to squeeze in what I could, around work and other obligations. ... ***[Jane Q. Public, 2014-09-08]***

Since it's important to agree on the equations before plugging in values, all you have to do to describe your method is to state the equation you're using, and state the values you'll plug in. This would only take about five minutes. I know because that's what I did below.

> ... I have explained several times now that these Sage equations are not exactly straightforward and easy to read. I have been doing my own calculations in a clear and straightforward manner, making them as easy to read as possible. You really expect me to read this stuff? ... ***[Jane Q. Public, 2014-09-08]***

Once again, I'm sorry. I take full responsibility. I've changed the formatting so that each value being plugged in is on its own line. Does that make it more readable? I've also added some comments to the code which might help you understand it:

Now that we've agreed on the inner shell temperature of ~149.9F, let's take the last step. Calculate the enclosed source temperature.

Draw a boundary just inside the inner surface of the enclosing shell. Because nothing in the boundary is changing with time, power in = power out. The same constant electrical power flows in as before the shell was added. Net radiative power flows out from the source to the enclosing shell's inner surface.

As before, that net radiative power is described by Wikipedia's equation which accounts for areas and view factors.

```
#Completely surrounded by shell with finite conductivity.
var('sigma T_c T_h A_c A_h F_hc power epsilon_h epsilon_c')
eq1 = power == sigma*(T_h^4 - T_c^4)/((1-epsilon_h)/(epsilon_h*A_h) +
1/(A_h*F_hc) + (1-epsilon_c)/(epsilon_c*A_c))
soln4 = solve(eq1.subs(
T_c=338.629929346551,
power=15028.4258648090,
sigma=5.670373e-8,
epsilon_h=0.11,
epsilon_c=0.11,
F_hc=1,
A_h=510.064471909788,
A_c=511.185932522526) #End of constant definitions.
,T_h) #Variable solved for: enclosed source temperature.
soln4[0].rhs().n()
```

The first line "var('sigma..." declares my variables.
The line "eq1 = power == sigma..." is my "power in = power out" equation using Wikipedia's equation for net radiative power.
The next line "soln4 = solve..." plugs in all the relevant variables and solves it for the enclosed source temperature T_h.
The last line displays the answer.

So I've described my method for calculating the enclosed source temperature from start to finish. Before I post that final answer, can we agree with my method? If not, could you please describe your method?

Again, all you have to do to describe your method is to state the equation you're using, and state the values you'll plug in. That's what I did above, and it only takes about five minutes. If you don't know how to derive the equation, just let me know and I'll try to help. If you don't know which values to plug in, let me know which ones you're confused about. Since you're busy, don't worry about solving the equation. I'll solve it for you.

Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-09 13:25 (#47865589)

Once again, you've seen my method in action from start to finish. I've repeatedly asked if we can agree on that method before posting my final numerical answer. That's because I think you deserve a chance to show that you're capable of judging my method based on its physics, as opposed to reflexively objecting if my numerical answer contradicts the PSI Sky Dragon Slayers.

I will judge your method based on its physics, when I see your answer. You don't need my approval of your method to show it to me. You're asking me to approve of how a house was painted before you painted it. It should be no surprise that I balk at this request.

In a normal exchange of this kind, you would solve the problem, then justify your steps. Or do them at the same time. You're trying to get me to approve of your steps before you have fully taken them. That's... weird. I repeat that you don't need my approval to do something you claim you've already done.

For instance, suppose I told you that my final numerical answer agrees with the PSI Sky Dragon Slayers. Would that make you agree with my method's physics? In that case, would you really be agreeing with my method, or agreeing with the answer you want to hear?

No, and once again I resent the insulting personal remark. I have given you no genuine reason to say this.

Regardless of the answer you come up with, I want to see the individual steps justified. I don't, however, have any interest in agreeing to supposed "justification" of your answers before I've even seen them. That leads to misunderstandings and ambiguity. I don't care if you solve each equation first and then explain it afterward. In fact I'd vastly prefer that you do. I do want to see the justification. There's no doubt of that. But in asking for agreement before you even do the math, you're putting the cart before the horse. Suppose you transposed a number somewhere in your calculation. Should I then agree with your answer if your methodology were correct, but you made some other error? That would be ridiculous.

I intend to check your steps thoroughly AFTER you're done anyway, regardless of whether you explain before or afterward. If I have any specific objections at that time, I will bring them to your attention. That is the proper way to do things.

If you won't know if you agree with my method until you see my final numerical answer, you're depriving yourself of this chance to demonstrate your intellectual integrity.

Bullshit. I won't agree until I see the answer because I want to check your work. It's that simple. And you have given me here a perfect example of how you continue to toss in ambiguities when they're completely unnecessary:

As before, that net radiative power is described by Wikipediaâ(TM)s equation which accounts for areas and view factors.

I just want to make it very clear why I object to the way you ask for agreement, all the while throwing in ambiguities. You say you're using the equation for radiative power, when you're linking to the equation for heat transfer.

We already know what the equation for radiative power is: (epsilon)(sigma)T^4.

soln4[0].rhs().n()

Further, you've twice written that the last line contains the solution, when in fact it contains nothing of the sort.

So before you ask me to agree to things, MAYBE you should damned well be careful to make them clear in the first place?

Even better, just do the damned calculation, then we can discuss it. You're wasting our time. I have repeatedly told you I don't have much to spare right now, and you claim to have even less.

I will have no more time to devote to this until this evening. I'll check back then.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-09 13:58 (#47865853) Homepage Journal

> ... I will judge your method based on its physics, when I see your answer. ... ***[Jane Q. Public, 2014-09-09]***

No, that's my entire point. I already described my physics. If you need to see my final numerical answer before you can judge my method, then you're not actually judging my method based on its physics.

Ironically, you actually are judging my method based on its physics, which is actually a step forward:

> > As before, that net radiative power is described by Wikipedia's equation which accounts for areas and view factors.
>
> I just want to make it very clear why I object to the way you ask for agreement, all the while throwing in ambiguities. You say you're using the equation for radiative power, when you're linking to the equation for heat transfer. We already know what the equation for radiative power is: (epsilon)(sigma)T^4. ***[Jane Q. Public, 2014-09-09]***

Once again, your equation is only for net radiative power (or net heat transfer) to a 0K blackbody. But I've obviously failed to explain net radiative power (or net heat transfer) between two gray surfaces, so we'll have to agree to disagree.

But this is good. You're actually judging my method based on its physics! I'm proud of you, Jane!

You seem to be asserting that Jane's equation should be used instead of Wikipedia's equation. Is that the case? If so, all you need to do to catch up is to list the values you'll plug into that equation, like I did. This would only take a few minutes. If you're confused and need help, just ask.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-09 14:56 (#47866347)

Ironically, you actually are judging my method based on its physics, which is actually a step forward:

NO!!! I was not "judging your method". I was describing your nasty habit of confusing the issues. Two very different things.

Once again, your equation is only for net radiative power (or net heat transfer) to a 0K blackbody.

NO, it is not. It is the equation for THE RADIATIVE EMITTANCE (often called radiative power) **of a surface**. Its instantaneous value does not depend on surrounding conditions or nearby bodies. The only variables are emissivity and temperature.

I repeat: that equation has nothing **directly** to do with heat transfer, though heat transfer equations may rely upon it.

This is just another example of how you have tended to obfuscate things. What I stated was a very straightforward, textbook equation that has **nothing at all** to do at all with "nearby 0K blackbodies".

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-09 15:00 (#47866387) Homepage Journal

Once again, we'll obviously have to agree to disagree about the net heat transfer between two gray surfaces.

Again, you seem to be asserting that Jane's equation should be used instead of Wikipedia's equation. Is that the case? If so, all you need to do to catch up is to list the values you'll plug into that equation, like I did. This would only take a few minutes. If you're confused and need help, just ask.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-09 19:22 (#47868251)

Once again, we'll obviously have to agree to disagree about the net heat transfer between two gray surfaces.

What the HELL are you talking about? I understand the equation from Wikipedia. I just happened to mention that you called it a power equation rather than a heat transfer equation. THAT IS ALL. Then later, you called my emittance equation a heat transfer equation. That's not anything I did, that's something you did.

Here are your words, complete with the link I was referring to:

As before, that net radiative power is described by Wikipedia's equation which accounts for areas and view factors.

Anybody who follows that link can see that it is a **heat transfer** equation, not a "net radiative power" equation.

THEN I gave you an equation for **radiant emittance**: (epsilon)(sigma)T^4, and you called it a "heat transfer" equation having something to do with 0K black bodies, which is simply false. That equation, for **gray bodies**, can be found here.

Now, when I simply pointed out these apparent MISTAKES in terminology to you, in order to try to keep things straight, you're throwing a fit. Well, don't try to blame this on me. I was just explaining why the things YOU have been saying lead to confusion. I will not apologize for simply trying to sort out basic misunderstandings.

Again, you seem to be asserting that Jane's equation should be used instead of Wikipedia's equation. Is that the case? If so, all you need to do to catch up is to list the values you'll plug into that equation, like I did. This would only take a few minutes. If you're confused and need help, just ask.

Why would you think that? Have I said anything like this? Answer: no, I have not, as just about any reader should have little trouble understanding. In fact I told you twice now that equation was incorrect. I've stated it right here in black and white.

I did not assert any other equation is "correct". I'm letting YOU show me YOUR methods. That's what you said you were going to do, right?

So, I don't know what the hell is going on. Are you drunk?

I will repeat what I have already stated several times: the only things I "insisted" upon were that we agree on the initial conditions of the problem. I do not insist you use any particular equations. This is YOUR show, which I am participating in only as a courtesy. I'm just following along.

Either get on with it, or not. But if you refuse to do what you told me I was coming here to see you do (refute Latour), then you refuse. That has nothing to do with me, and you don't get blame it on me.

Get the hell on with it, or not. Whichever you do, it's YOUR choice. I am very, very close to calling you full of shit and posting this where everyone can see it.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-09 19:31 (#47868301)
My honest opinion is that YOU are the one who is trolling, and never intended to actually refute anybody at all. You simply wanted to waste more of my time.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-09 20:05 (#47868495) Homepage Journal

> As before, that net radiative power is described by Wikipedia's equation which accounts for areas and view factors. ***[Dumb Scientist]***

> ... You say you're using the equation for radiative power, when you're linking to the equation for heat transfer. We already know what the equation for radiative power is: (epsilon)(sigma)T^4. ***[Jane Q. Public, 2014-09-09]***

And then:

> Once again, we'll obviously have to agree to disagree about the net heat transfer between two gray surfaces. ***[Dumb Scientist]***

> What the HELL are you talking about? I understand the equation from Wikipedia. I just happened to mention that you called it a power equation rather than a heat transfer equation. THAT IS ALL. ***[Jane Q. Public, 2014-09-09]***

We'll obviously have to agree to disagree that I explicitly used the equation for **net** radiative power, and linked to an equation described as: *"The radiative heat transfer from one surface to another is equal to the radiation entering the first surface from the other, minus the radiation leaving the first surface."*

We've agreed that net radiative power is power out minus power in through a boundary, but we'll obviously have to agree to disagree that Wikipedia's radiative heat

transfer is "equal" to net radiative power.

> ... THEN I gave you an equation for radiant emittance: (epsilon) (sigma)T^4, and you called it a "heat transfer" equation having something to do with 0K black bodies, which is simply false. ... ***[Jane Q. Public, 2014-09-09]***

Again, we'll obviously have to agree to disagree that I explicitly used the equation for **net** radiative power (or **net** heat transfer). If I hadn't, it might make sense for Jane to say *"We already know what the equation for radiative power is: (epsilon) (sigma)T^4."*

Again, we'll obviously have to agree to disagree that I explicitly used the equation for **net** radiative power (in Watts). If I hadn't, it might make sense for Jane to say we already know that equation is the equation for radiant emittance (in W/m^2).

Once again, if I had explicitly used the equation for **net** radiative power, Jane's equation would only be valid for **net** radiative power (or net heat transfer) to a 0K blackbody. But I've obviously failed to explain net radiative power (or net heat transfer) between two gray surfaces, so we'll have to agree to disagree once again.

> ... Now, when I simply pointed out these apparent MISTAKES in terminology to you, in order to try to keep things straight, you're throwing a fit. Well, don't try to blame this on me. I was just explaining why the things YOU have been saying lead to confusion. I will not apologize for simply trying to sort out basic misunderstandings. ... ***[Jane Q. Public, 2014-09-09]***

If I was "throwing a fit" by saying we'll obviously have to agree to disagree, then what's this?

*"... non-person... disingenuous and intended to mislead ... he is either lying ... dishonest ... intellectually dishonest ... intellectually dishonest ... Khayman80's intellectual dishonesty ... Pathetic. ... you've come out the loser in every case... you can't win a fucking argument. You don't know how. You don't understand logic. You've proved this many times. Get stuffed, and go away. The ONLY thing you are to me is an annoyance. I have NO respect for you either as a scientist or a person. ... cowardice ... odious person ... you look like a fool ... utterly and disgustingly transparent ... Now get lost. Your totally unjustified arrogance is irritating as hell. ... You are simply proving you don't know what you're talking about. ... Jesus, get a clue. This is just more bullshit. ... spewing bullshit ... You're making yourself look like a fool. ... Hahahahahaha!!! Jesus, you're a fool. ... a free lesson in humility... you either misunderstand, or you're lying. After 2 years of this shit, I strongly suspect it is the latter. ... Now I **KNOW** you're just spouting bullshit. ... if we assume you're being honest (which I do not in fact assume) ... I wouldn't mind a bit if the whole world saw your foolishness as clearly as I do. ... stream of BS... idiot ... Your assumptions are pure shit. ... I'm done babysitting you..."* **[Jane Q. Public]**

"Jesus, you're a dumbshit. ... your adolescent, antisocial behavior ... keep making a fool of yourself. ... you're being such a dumbass ... your analysis of it is a total clusterfuck. ... you're so damned arrogant you think I'm the one being stupid. ... you were too goddamned stupid ..." **[Jane Q. Public]**

"... what a despicable human being you are ... after you are gone, I will quite happily reveal those things and your "legacy" won't be quite what you thought it was. ... get stuffed. I am far beyond tired of your incessant BULLSHIT. If you want to contemplate something before you die, I would suggest starting with meditating on why you have been such an incorrigibly rude, insufferable human being ... You'd at least expect a "physicist" to get that much right. ... Now I have given you your bone, doggie. GO AWAY. ... a clusterfuck pretending to be physics ... simply bad math ... you haven't even managed to ride your tricycle without falling off ... either you're not competent to analyze this, or (probably more likely), you are attempting yet again to misdirect from the real science ... weasel out of it ... you had to obfuscate it and throw n all this other bullshit. Every goddamned time. ... you can go knowing that you abdicated on a chance to prove to the world that you can solve "civilization-paralyzing misinformation". And I will know that you went exactly as you (from what you have shown me, anyway) deserve: unknown and deservedly so. ... you refuse to lose like a man ... you're STILL full of shit, you pretender. ... you're STILL full of shit, you pretender. This is the most ludicrous thing I've heard coming from someone who claims to be a real scientist in years. ... It is A WASTE OF MY TIME to argue with

you. You don't learn. I won't do it any more. And I'm going to give a copy of this to my grandchildren. ... bullshit ... weaseling ... all your misdirection ... I am willing to concede that you really are a Kool-Aid drinker, and can't accept that the dogma isn't what you thought it was. That's preferable to believing that you're simply a malicious lying sonofabitch. I am fucking well done here. ... Same shit different day. ... you won't do it because you know you're wrong. ... you're wrong by default ... Why don't you just shut up and do it? Why have you been so mightily struggling, like a fish on a hook, to avoid it? ... BS excuse ... Same shit different day. ... I consider that to be an admission of defeat. ... bullshit excuse ... I guess you do admit defeat. ... your analysis is ***completely full of shit****. ... absolute fantasy ... I'm really not sorry to say this after your past behavior, but showing you're wrong is just plain dirt simple. And not JUST wrong, but so ridiculously wrong that I can (and will, believe me!) use it as entertainment for certain of my friends. ... a pretty major concession that I don't think you deserve. ... Bullshit. ... you're still falling off your tricycle ... simple damned algebra ... You're just clownishly hand-waving again... START OVER AND DO IT RIGHT ... you're full of bull, and you have been all along.* ***Either you are incapable of doing this properly, or you're just bullshitting everybody for reasons of your own.*** *... Hahahahaha! ... just more bullshit ... no more bullshit ... of course you still won't, because you're not capable. ... if you don't want me to keep calling you (and showing you to others to be) nothing more than a clown. ... I want to show other people just how much a clown you actually are. ... shut up ... you want to try to mischaracterize everything I say... you were just messing with me. ... fantasy ... It feels as though I'm explaining to a high-school student who has never seen a physics problem before. ... supposed to have been a physics major. ... Stop being obtuse. ... SIMPLE MULTIPLICATION ... No matter how you try to bullshit your way around this, it is still WRONG. ... provably bullshit ... I'm just plain tired of your bull. ... Jesus, I'm glad you weren't one of my physics profs. ... That's your goddamned problem, and you don't get to complain about it. I'm really looking forward to showing this latest exchange to my friends. ... There is no way to weasel out of this, man. You're trying to output more power than you're putting in. This isn't even 11th-grade physics. Let's try it at something more like your level: You have 200 beans equally distributed among 10 squares. If you now take those beans, and divide them equally among 25 squares of the same size, how many beans do you now have per square? Show your work. ... THERE'S NOTHING "CUTE" ABOUT IT! IT'S AN ACCURATE ASSESSMENT OF YOUR ERROR! This is not "approximation", it's fucking logical error! JESUS CHRIST, man, you can't talk your way around this. ... You can violate thermodynamics all you want, and it doesn't prove a damned thing. ... If you continue to just bullshit your way around, as I have stated I will declare you in default and damned few reasonable people would disagree. ... NO. See my comment above. One more bullshit comment like this, and as I said, I will just call you a clown and few reasonable people will disagree. ... you are deliberately trying to make things difficult. ... It is dirt simple to show you are wrong. ..."* **[Jane Q. Public]**

> GISS ADMITTED GODDARD WAS RIGHT. YOU DIDN'T KNOW. YOU'RE IGNORANT OF THE FACTS. LEARN THEM. MEANTIME, GO AWAY. ***[Lonny Eachus, 2014-08-30]***
>
> Try Google, dumbshit. Unless you don't know how. It took me all of 20 seconds. ... Why? Why should I do this for you? Would you like me to wash your balls too? Answer: no. ... The fact I WON'T wash your balls for you is not evidence that they don't exist. The fact that YOU won't, IS. ... Correct. To all outside observers, so far, your balls don't exist. Why don't you prove that they do? show us. ... Should we just ASSUME it? Or, like you, should we require that you SHOW US? ... To make an even better analogy: there is a picture of them that has been posted online by your girlfriend. ... BUT we don't believe you really have any. Should we ask you to prove they're yours? Every time we discuss it? ***[Lonny Eachus, 2014-08-30]***
>
> Sorry, dude. You aren't going to get me to wash your balls. The rest of us are looking at pictures of your girlfriend. wondering when you're going to say "I won't hang them out again just for you. Look it up." ***[Lonny Eachus, 2014-08-30]***
>
> Are you REALLY that fucking stupid? ***[Lonny Eachus, 2014-08-30]***
>
> I've insulted you because you deserve it. Arguments were made. Your inability to absorb them is not evidence. ***[Lonny Eachus, 2014-08-30]***

> I guarantee something: that doesn't make ME an asshole. I'll leave it up to others what it does mean. ***[Lonny Eachus, 2014-08-30]***
>
> I am participating in only as a courtesy. I'm just following along. Either get on with it, or not. But if you refuse to do what you told me I was coming here to see you do (refute Latour), then you refuse. That has nothing to do with me, and you don't get blame it on me. Get the hell on with it, or not. Whichever you do, it's YOUR choice. I am very, very close to calling you full of shit and posting this where everyone can see it. ***[Jane Q. Public, 2014-09-09]***

Feel free to post this where everyone can see it. But you never will. And you'll never solve for the enclosed source temperature. Instead you'll just keep saying things like this:

> ... I have repeatedly tried to engage you in a thorough analysis of this experiment. EVERY TIME, you have done (usually incorrectly) a partial analysis... NEVER daring to face the full problem in real detail. ... You have NEVER, ONCE, tackled the problem head-on. ... Always weaseling sideways... ***[Jane Q. Public, 2014-08-30]***

No, you haven't even taken a single solitary step towards solving for the enclosed source temperature. But I've repeatedly tackled the full problem in real detail.

> See? Same shit different day. You won't sit down and do the calculations start-to-finish... simply another illustration of the depths of hand-waving you will go to, rather than actually doing all the calculations on the actual experiment from start to finish. ... The only reasonable conclusion to be drawn here is that you won't do it because you know you're wrong. ***[Jane Q. Public, 2014-08-30]***

It would only take you a few minutes to write down the equation and values that could be used to solve for the enclosed source temperature. Is the only reasonable conclusion to be drawn here that you won't do it because you know you're wrong?

> ... I thought we'd actually settle this scientifically, once and for all, but I see that you were never really interested in that anyway. ... ***[Jane Q. Public, 2014-08-30]***

This might be the most ironic statement ever, coming from someone who refuses to take a single baby step towards solving for the enclosed source temperature.

> My honest opinion is that YOU are the one who is trolling, and never intended to actually refute anybody at all. You simply wanted to waste more of my time. ***[Jane Q. Public, 2014-09-09]***

In the time it's taken you to write all these incoherent rants and talk about washing people's balls, you could've written down the equation and values describing the enclosed source temperature. In fact, you could've done that many times over. Instead, you cuss in ALL CAPS. Are you really going to give a copy to your grandchildren?

If you can't write down that equation because you're not sure which one is correct, just let me know and I'll try to help. If you're not sure which values to plug in, I'll try to show you where we've already agreed on those values. If you're still not sure these values are correct, just let me know and I'll try to help you understand. Again, don't worry about all that confusing algebra and arithmetic. I'll help you take care of all that. But you need to take a baby step on your own, by showing that you're capable of writing down an equation that can be used to solve for the enclosed source temperature.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-09 21:25 (#47868889)
You're just confirming what I said earlier. You're finally proving that you were full of

bull all along.

We'll obviously have to agree to disagree that I explicitly used the equation for net radiative power, and linked to an equation described as: "The radiative heat transfer from one surface to another is equal to the radiation entering the first surface from the other, minus the radiation leaving the first surface."

We're not "agreeing to disagree" on anything. You're just plain wrong. You just confirmed exactly what *I* said above: that this is a heat transfer equation, but you called it a "net radiative power" equation.

We've agreed that net radiative power is power out minus power in through a boundary, but we'll obviously have to agree to disagree that Wikipedia's radiative heat transfer is "equal" to net radiative power.

We will most certainly have to disagree on **that**, because it's wrong. That equation is for finding Q, the net **heat transfer**, which is not "equal" to power at all. It is energy in Joules.

If you are using it to calculate "net radiative power", then clearly show here how you have manipulated the equation to solve for power instead, so that other people can check your work.

If I was "throwing a fit" by saying we'll obviously have to agree to disagree, then what's this?

Yes, you are quite clearly throwing a fit, and comparing it to something else doesn't change that, or make anything else you have said correct. I had plenty of good reason for stating what I did in the quotes you post here, and those reasons are ALSO soon to be part of a widely-read (very possibly and we can hope) public record. AND... that is all completely beside the real point. You're stalling, and obfuscating again.

No, you haven't even taken a single solitary step towards solving for the enclosed source temperature. But I've repeatedly tackled the full problem in real detail.

Except for your final answer. And whether *I* have done it is completely immaterial. You claimed Latour was wrong, and that you had successfully refuted him. So where is your final answer for the temperature of the heat source at stead-state? THAT was what you said you were calculating, so where is it?

This particular Slashdot thread is not MY show, it is yours. You demanded it. I have given you all the opportunity you asked for. So where's the punchline? Where's the finale?

It would only take you a few minutes to write down the equation and values that could be used to solve for the enclosed source temperature. Is the only reasonable conclusion to be drawn here that you won't do it because you know you're wrong?

How could I possibly be "wrong"? I'm not doing anything. This is YOUR claim, not mine. This is what YOU said YOU could do. It has nothing to do with me, except that I (very reluctantly, for reasons we're seeing now) agreed to be your audience.

In the time it's taken you to write all these incoherent rants and talk about washing people's balls, you could've written down the equation and values describing the enclosed source temperature. In fact, you could've done that many times over. Instead, you cuss in ALL CAPS. Are you really going to give a copy to your grandchildren?

Why should I do that? YOU said you were going to refute Latour. It wasn't my claim. You got partway through, now you refuse to finish, and you're trying to blame ME somehow? How do you figure?

You know what Latour's claims and math were. (They're not mine, they're his.) You proclaimed loudly that he was wrong (actually your words were much stronger than that), and that you had refuted him. I called bullshit, and now here we are. You wanted an opportunity to show that you were honest. Here it is.

I have no obligation to even WRITE any equations, except as much as was necessary to agree to initial conditions. The rest of the show is yours. So... where is it? Does a comedian expect his audience to deliver the punchline? Does an actor require the audience to deliver his lines? Does a physicist expect the readers of his paper to do his math for him?

This might be the most ironic statement ever, coming from someone who refuses to take a single baby step towards solving for the enclosed source temperature.

Wrong. I have stated twice or maybe 3 times now that I haven't even tried. And I actually have reasons for that, which I will explain to everybody once you are done here (or even if you refuse to finish). **Nor do I have any obligation to try. This is your claim. Not mine.** Demonstrate its truth like you said you were going to, or prepare to be publicly declared a charlatan. At least if you finished your "refutation", the worst you could be called is wrong. If you refuse to continue, others will have plenty of reason to call you both wrong **and** a liar.

If you can't write down that equation because you're not sure which one is correct, just let me know and I'll try to help. If you're not sure which values to plug in, I'll try to show you where we've already agreed on those values. If you're still not sure these values are correct, just let me know and I'll try to help you understand. Again, don't worry about all that confusing algebra and arithmetic. I'll help you take care of all that. But you need to take a baby step on your own, by showing that you're capable of writing down an equation that can be used to solve for the enclosed source temperature.

Hahaha! **I've been WAITING for you to show me how this is done. I've asked you about five times now to show me.** What are you waiting for? I want you to show us how you did what you claimed you have already done -- refute Latour -- so I, and anyone else who reads this later, can check your work.

But you don't get to pretend it's any lack of understanding on my part. I think readers can easily see that just up a comment or two ago I corrected 2 errors of yours.

Here's your incentive: if you can actually, successfully complete a refutation of Latour, and show us, and it checks out, I will be **happy** to declare to everyone that I was wrong and you were right about that issue. You have my word. I will shout it out loud. I'll admit it here on Slashdot and even open a Twitter account and post it there.

But you're stalling an awful lot for someone who declared he was short of time and wanted to get this done.

Here's the thing: I have said what I have to say, unless and until you decide to post the rest of YOUR refutation of Latour.

Slashdot has a time limit on these old threads. If you don't post the rest by tomorrow, they will likely close the thread and archive it. I don't know the exact time limit but I have given you plenty of time already, and overly indulged you, but that is ending now. You stated yourself, just above, that it is not difficult to do.

If this thread is archived before you post the last bit of your supposed refutation (you still have plenty of time), I am going to declare you a fraud and a failure. Because you will have given me all the **reason** I require. I have given you every opportunity, and I have been more than patient. I am not going to do your work for you. It's YOUR refutation, not mine. Or at least, you have claimed it is. Own it, or lose.

And let's get one more thing straight: if I have to finish your problem for you, using YOUR methods, I'm still going to declare you a failure, regardless of whether the answer turns out to be correct. Because YOU claimed you could do it. So show us.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-09 21:53 (#47868997) Homepage Journal

> We will most certainly have to disagree on **that**, because it's wrong. That equation is for finding Q, the net **heat transfer**, which is not "equal" to power at all. It is energy in Joules. ***[Jane Q. Public, 2014-09-09]***

No, Jane. I linked to Wikipedia's equation for radiative heat transfer, which is in Watts,

not Joules. You can verify this by noticing the "dot" over the heat transfer "Q" on the left hand side of that equation. In physics-speak, a "dot" means a "time derivative" so that equation is in units of power (Watts). Or you could've checked the units on the right hand side, and verified that they're also in units of Watts, just like I said.

> ... So where is your final answer for the temperature of the heat source at stead-state? THAT was what you said you were calculating, so where is it? ... ***[Jane Q. Public, 2014-09-09]***

The final answer for the enclosed source at steady-state is 385.4 K (234.1 F). Anyone with a calculator could have verified this based on my comment yesterday.

> ... How could I possibly be "wrong"? I'm not doing anything. This is YOUR claim, not mine. ... ***[Jane Q. Public, 2014-09-09]***

Your claim that the source doesn't warm after the passive plate is added is wrong.

> ... Why should I do that? YOU said you were going to refute Latour. It wasn't my claim. You got partway through, now you refuse to finish, and you're trying to blame ME somehow? How do you figure? ... ***[Jane Q. Public, 2014-09-09]***

The final answer for the enclosed source at steady-state is 385.4 K (234.1 F). Anyone with a calculator could have verified this based on my comment yesterday.

> ... Hahaha! **I've been WAITING for you to show me how this is done. I've asked you about five times now to show me.** What are you waiting for? I want you to show us how you did what you claimed you have already done -- refute Latour -- so I, and anyone else who reads this later, can check your work. ... Here's your incentive: if you can actually, successfully complete a refutation of Latour, and show us, and it checks out, I will be **happy** to declare to everyone that I was wrong and you were right about that issue. You have my word. I will shout it out loud. I'll admit it here on Slashdot and even open a Twitter account and post it there. ... I have said what I have to say, unless and until you decide to post the rest of YOUR refutation of Latour. if I have to finish your problem for you, using YOUR methods, I'm still going to declare you a failure, regardless of whether the answer turns out to be correct. Because YOU claimed you could do it. So show us. ***[Jane Q. Public, 2014-09-09]***

The final answer for the enclosed source at steady-state is 385.4 K (234.1 F). Anyone with a calculator could have verified this based on my comment yesterday.

So I successfully completed a refutation of Dr. Latour, and showed you. Does it check out? If so, will you really be **happy** to declare to everyone that you were wrong? Or was that a lie?

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-09 22:39 (#47869133)

No, Jane. I linked to Wikipedia's equation [wikipedia.org] for radiative heat transfer, which is in Watts, not Joules.

Ahah. Very well, you caught me on that one. I was not aware of the dot-notation. I never pretended to be a physicist. I don't see that notation in the engineering references I have handy.

Your comment about my radiative power equation though was referencing that that same page, but that wasn't what *I* was actually referencing. It might be relevant to black bodies in some way but my own sources (and Wikipedia, too, at the link I showed you) say it is the radiative power out of a gray body at temperature "T" and emissivity "epsilon", and I used it to compute power out of the heat source initially, remember? Our radiated power figures for the heat source in initial conditions agreed,

even if you calculated it a different way.

The final answer for the enclosed source at steady-state is 385.4 K (234.1 F). Anyone with a calculator could have verified this based on my comment yesterday.

Certainly, I could have found it with my calculator easily enough. But I had reasons for wanting YOU to post it yourself. Among those reasons, but not the only one, was that it was YOUR claimed refutation, not mine. You get to take either credit or blame, not me.

So! Great news! You have finally completed your claimed refutation of Latour. I shall examine it in detail and get back to you. Probably tomorrow some time.

Just so we are absolutely clear on what your claim is: starting at the agreed-upon initial conditions, heat source at 150F, when a hollow sphere is suddenly inserted into the chamber, completely surrounding the heat source, of the specified dimensions, then when allowed to reach steady-state the actual temperature of the heat source is 234.1 degees F.

Did I summarize that accurately enough? I don't want to re-hash the initial conditions we agreed upon. I still agree with them.

If so, will you really be happy to declare to everyone that you were wrong? Or was that a lie?

Of course. I don't mind admitting it when I'm wrong. But I have to check your work first. I already strongly suspect that there is a large hole in your reasoning, but I will not have time to check it until tomorrow. Stay tuned.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-09 22:45 (#47869163) Homepage Journal

> Just so we are absolutely clear on what your claim is: starting at the agreed-upon initial conditions, heat source at 150F, when a hollow sphere is suddenly inserted into the chamber, completely surrounding the heat source, of the specified dimensions, then when allowed to reach steady-state the actual temperature of the heat source is 234.1 degees F.
>
> Did I summarize that accurately enough? I don't want to re-hash the initial conditions we agreed upon. I still agree with them.

Yes, that summary is accurate enough.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-10 8:58 (#47872169) Homepage Journal

> ... Slashdot has a time limit on these old threads. If you don't post the rest by tomorrow, they will likely close the thread and archive it. I don't know the exact time limit but I have given you plenty of time already, and overly indulged you, but that is ending now. You stated yourself, just above, that it is not difficult to do. ... If this thread is archived before you post the last bit of your supposed refutation (you still have plenty of time), I am going to declare you a fraud and a failure. ... ***[Jane Q. Public, 2014-09-09]***

After this thread is closed, this conversation can continue here.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-10 10:40 (#47873519)
If they don't archive this thread, I will have my answer for you a bit later today. I have other obligations.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-10 19:13 (#47877153) Homepage Journal

Jane's obligations include continuing to spread misinformation about ocean acidification even after I've repeatedly debunked him.

So I predict that Jane's answer won't include any equations that could be used to calculate the enclosed source temperature. Instead, he'll probably grace us with another lengthy, incoherent rant about "problems" in my analysis which are (as usual) too vague to be expressed in equations. In the extremely unlikely event that Jane musters up the courage and competence to actually write down an equation that could be used to calculate the enclosed source temperature, it will almost certainly violate conservation of energy.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-10 21:04 (#47877583)
The first thing I want to do here is ask a question of khayman80. Did he take over 2 years to fully -- and at least somewhat clearly -- explain the methodology for his "solution" to this problem because he honestly thought he had the correct answer, or because he's just a trolling, malicious, lying son of a bitch?

I do not know the answer for certain, but for a number of reasons I am strongly convinced of the latter.

I ask because for 2 years now he has berated me, publicly derided and taunted me, and (in my strong opinion) libeled me, based on my position regarding Spencer's challenge, even though I knew he was wrong all along, but in order to prove it to everybody else in an understandable way, he had to explain his methods clearly. It's hard to disprove something when it's not clearly defined.

But now he has. And now I can show clearly, to someone with high school level math skills, that he was utterly, abjectly, and rather pathetically wrong, and the "Slayers", as he calls them, were right all along. Because, you see, as I know from experience, it isn't enough to show people the right way. At the same time it is necessary and desirable to show beyond doubt that "global warming alarmist" bullshit is just that: bullshit.

What's funny, khayman80, is that you may have thought I was being funny or incompetent with my interjections, but I was actually feeding you hints all along the way about the right way to do this and the correct answer, but you didn't take any of those hints. Not one. Did you really think I was refusing to "agree" with your

assumptions because I was stupid? Again: was that due to mere incompetence and arrogant belief in your own abilities and contempt for others? Or was it because you were protecting your political ideology, or global warming religion, or maybe JPL grant money? I really don't know, and I really don't care, but now I can show the world very clearly, using your own words, that you were wrong the whole time. I would thank you for that but you don't deserve thanks.

Let's summarize briefly: I suggested to you earlier that the problem was simpler than how you were treating it. I also gave you some good hints that some of your assumptions were incorrect. And I even gave you a QUOTE from an engineering textbook explaining that if you aren't careful, "thermodynamic" reasoning could get you into a lot of trouble when it comes to heat transfer.

I'm going to start by showing the correct answer. I am going to show my basic work but not all the intermediate steps. You are capable of doing those on your own. Later I'm going to do a full writeup and post this on the internet, some time later. After my brief explanation of the correct answer, I'm going to explain more thoroughly where you went wrong.

I will make use of only ONE of your assumptions: that the enclosing plate (hollow sphere) is, due to thermal conductivity, **approximately** the same temperature on both sides. It's only 1mm thick after all, and the thermal conductivity of aluminum was a stipulation of yours so it will be the same to a couple of decimal places, give or take. So the answer won't be exact, but it will be reasonably accurate. Certainly close enough to demonstrate the concept.

I am also going to make one assumption myself (which is not really an assumption, but a calculation): given the dimensions stipulated by khayman80, the difference between the outside and inside areas of the enclosing hollow sphere are not enough to matter given the precision of our other calculations. (About 0.0001 m^2, give or take.) This simplifies our equations quite a bit.

Here are the initial conditions we agreed upon: a central sphere of dimensions listed below, with enough power input to heat it to 150 deg. F (338.71K) in radiative steady-state with chamber walls that are actively cooled to 0 deg. F (255.37K).

As for variable names, I do not intend to fully use "standard" notation because this explanation isn't for physicists, it's for others who are non-professionals to follow along.

So we have 4 surfaces, which I will call 1, 2, 3, 4 moving outward, so 1 is the surface of the heat source, 2 the inside of the hollow sphere, 3 the outside of the hollow sphere, and 4 the chamber wall. T3 for example would be radiative Temperature of surface 3. The material is a theoretical "aluminum" that acts as a gray body, so absorptivity = emissivity. A further stipulation is that when temperature changes, other factors like emissivity stay the same (per Spencer).

emissivity (e): 0.11
S-B constant (s or sigma): (5.6704 * 10 ^-8 W/m^2) / K^4
INITIAL temperature of heat source: 338.71K
INITIAL temperature of chamber wall: 255.37
Radius of heat source: 6.371 m
Area of heat source: 510.065 m^2
Radius of inner passive plate surface: 6.378 m
Area of inner surface: 511.186 m^2
Radius of outer passive plate surface: 6.379 m
Area of outer surface: 511.346 m^2
Radius of chamber wall: 6.386 m
Area of chamber wall: 512.469 m^2
INITIAL radiant output of source at 338.7K: 82.12 W/m^2
INITIAL radiated power of source at 338.7K: 41,886.54 W

I'm not being terribly rigorous here because I don't have to be. I'm not going to worry about significant digits, but just calculate to a few decimal places.

The big clue I dropped several times, which khayman80 should have picked up on, I am going to call CLUE #1:

The formula for radiant temperature of a gray body **does not depend on surrounding bodies**. There is no variable in the steady-state, gray-body temperature equation for heat **transfer**. The **only** variables (I was careful to point out) are radiant emittance and emissivity. Given those and the Stefan-Boltzmann constant, temperature can be calculated. No other nearby bodies need apply. (In the reverse direction, again for gray bodies, temperature, emissivity and the S-B constant are sufficient to calculate radiant emittance.)

Before we get on with it, we have to note CLUE #2:

According to the S-B equation itself, net heat transfer is either 0, or only in one direction. Yes, we are talking NET here. We always have been.

Calculate initial (denoted by "i") heat transfer from heat source to chamber wall. We are doing this only to check our work later. Using the canonical heat transfer equation for gray bodies, reflecting on CLUE #2, and the fact that the "view factor" from 1 to 2 (F12) = 1, PLUS our assertion that area of 2 is close enough to the area of 3 to ignore, we get the rate of heat transfer from surface 1 to surface 4:

p(i) = (e)(s) * (T1^4 - T4^4) = (e)(s) * (8908858139.78) = 55.5913

We now insert our hollow sphere (somehow, suddenly and magically, it doesn't matter, this is assumed) which fully encloses the heat source. It is 7mm away from the heat source, and it is 7mm away from the wall. And we let things come back up to radiative steady-state.

And now, to do this properly, we must make a bit of a mental leap, which may be difficult for some people: the **total** heat transfer now from heat source to the chamber wall is equal to: (heat transfer from heat source to the inside of the enclosing plate) **PLUS** (heat transfer from the outside of the enclosing plate to the wall).

This is a place where "thermodynamic thinking" will mess you up. Some people will insist that the TOTAL heat transfer must take place between EACH object. But that is simply not true. This was CLUE #3: a quote from a heat transfer engineering textbook about how "thermodynamic thinking" will lead one astray.

Think of it this non-tecnical way: radiant heat transfer is **a function of *difference* in temperatures.** If you have two differences, A = X - Y and B = Y - Z, then A - Z = (X - Y) **plus** (Y - Z).

Another mistake is to think that the relative areas of the surfaces matter much. Not in this case, because we know the heat transfer is going in one direction (outward), and the "view factor" of concentric spheres from inside to out is 1. So all the radiation from the hotter body strikes the colder body.

Where does that leave us? As I stated before (although admittedly that was due to a misunderstanding), the solution is, relatively speaking, "dirt simple". At steady-state, the enclosing hollow sphere MUST transfer as much power OUT as is coming IN. (Another error made by khayman80 is related to this, which I will discuss below.)

The rate of energy transfer from surface 1 to 2 is (p12) = (e*s) * (T1^4 - T2^4). And T1 is known!

The rate of energy transfer from 3 to 4 is p(34) = (e*s) * (T3^4 - T4^4) And T4 is already known as well!

Our one major assumption was that the inside and outside temperatures of the hollow sphere (surfaces 2 and 3) are extremely close to the same temperature due to thermal conductivity. So we can substitute temp 2 for temp 3 and get;

(e*s) * (338.71^4 - T2^4) = (e*s) * (T2^4 - 255.37^4)

And it gets simpler. Factor out (e*s) from both sides. (Despite khayman80's assertion that we cannot do this, yes we can. It is the same scalar and the same constant on both sides.) Now we get our "dirt simple" equation:

(338.71^4 - T2^4) = (T2^4 - 255.37^4)

Now just solve for T2: 305.47K = 90.176 deg. F.

Check our work: using the same heat transfer equation, calculate p(12) and p(34) individually. I will skip the math, you've seen how to do it.

p(12) = 27.7832, p(34) = 27.7813

Add them together for the total heat transfer: 27.7832 + 27.7813 = 55.5645 total heat transfer.

This checks against our initial calculation which was 55.5913. The difference is only 0.0268, or about 0.1%. Close enough for what we're doing.

I should add that I also checked this against khayman80's "big formula" from Wikipedia. While many of the the actual numbers involved were not the same, both sides of the heat transfer problem did check against each other, AND I still got a temperature of 305.47K, give or take a few thousandths.

I will also add that this result is consistent with what most people would expect from experience: if you asked people what would happen if you put a thin piece of aluminum between a furnace and a refrigerator, most people will NOT say "The plate will take on the temperature of the furnace and the furnace will get hotter." What they will (correctly) say is: "The plate will warm up to a temperature somewhere between that of the furnace and the refrigerator."

So our final result, in a nutshell: Heat source stays at 338.71K (150F). Enclosing plate warms to 305.47K (90.18F). Chamber wall stays at 255.37K (0F).

Where was "khayman80" wrong?

Just about everywhere. I left him clues along the way, but he did not take even one of them. I am not going to judge here whether he was honestly mistaken or he was just a malicious bullshitter, but in all honesty it's hard to imagine someone who calls himself a physicist **unintentionally** getting it so badly wrong so many ways. Unless his "global warming" religion would simply not allow him mentally to accept the right answer.

The Stefan-Boltzman equation is clear: net radiative heat transfer is ONLY from hotter to colder. Placing a colder non-reflective object next to a warmer one does not radiatively make the hotter object hotter still. It is important to distinguish this situation from reflectors like "space blankets" or insulators like winter jackets. Those work in entirely different ways, and are irrelevant to our gray-body radiative experiment.

If you set up your equation to try to make heat go from colder to warmer, the sign of the answer changes from + to - indicating a net heat flow in the opposite direction. There were many such red flags here that khayman80 should have picked up on:

CLUE #1: The Stefan-Boltzmann equation itself. Barring any issues like "view factor" which can modify the answer somewhat, for gray bodies at radiative steady-state the **radiative emittance**, or power output, is related ONLY to emissivity and temperature, via the S-B constant. Nearby objects are of no concern for the calculation. If they were, there would be variables for them. This is not the same as "heat transfer", it is just the relationship between radiative power and temperature of a single body.

CLUE #2: I refused to agree to some of khayman80's "assumptions". For the simple reason that they were wrong. The first big nonsense assumption was that the power output of the heat source had to equal the power output of the **outside** of the enclosing hollow sphere. But wait! The outside area of the sphere is only part of the surface area. A body at temperature X emits its power from ALL the surfaces. The total surface area of the sphere is 1022.53 m^2, NOT 511.346 m^2. He (100% incorrectly) nearly doubled his W/m^2 by not accounting for almost half of the surface area (about 0.4999 of it).

I agreed with him that "given his assumptions", it was the right answer. I just did not feel like mentioning at the time that his assumptions were incorrect.

CLUE #3: khayman80 compounded this error, by then assuming that ALL of the radiant power of the enclosing sphere was ALSO emitted from the INSIDE surface. When in fact only about 0.4999 of it is. So he doubled his power outward, AND

doubled his power inward (or close enough). And yet HE was the one trying to make the "thermodynamic" argument that power in = power out. He drew his boundaries in the wrong places (which I hinted to him but he asserted was impossible). The second thing he got wrong here was:

CLUE #4: I supplied him with a long and pointed quote from an engineer's heat transfer TEXTBOOK, strongly hinting that he ought to re-examine his fallacious "thermodynamic" approach to the problem. He ignored the hint AND did his math wrong (see clue #3).

CLUE #5: khayman80's "big equation" (see link above) for heat transfer includes this admonition:

"However, this value can easily change for different circumstances and different equations should be used on a case per case basis."

The areas in his equation were unnecessary because **S-B Law** says the net heat transfer is only outward, the view factors F12 = F34 = 1, and area 2 ~= area 3. Therefore the areas were irrelevant and about all he accomplished with his large equation was to further confuse the issue. I repeat that **I did check my answer using the equation he claimed to use himself.** And I still confirmed that T2 ~ T3 = 305.47K.

I could go on, but this was my BRIEF analysis of khayman80's folly. As I sincerely promised him, I will be writing up a more complete discussion of his errors later on "the interwebz".

Spencer and khayman80 were wrong. Latour was right, and I was correct to stick to my guns and say so, despite all of khayman80's public bullying and insults and braying like an ass.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-10 21:07 (#47877591)
Correction: "reflecting on CLUE #2, and the fact that the "view factor" from 1 to 2 (F12) = 1, PLUS our assertion that area of 2 is close enough to the area of 3 to ignore, we get the rate of heat transfer from surface 1 to surface 4"

Should have just been: "reflecting on CLUE #2, and the fact that the "view factor" from 1 to 2 (F12) = 1, we get the rate of heat transfer from surface 1 to surface 4"

The relationship between areas 2 and 3 are not relevant until later.
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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-10 21:23 (#47877639)
I almost forgot to mention another aspect of khayman80's folly.

He could have discovered he was wrong almost 2 years ago, almost immediately, by checking his work. He didn't. And this was the result:

He **assumed** that the total power output of the heat source was available on the OUTSIDE of the enclosing hollow sphere. We now know this was incorrect. He then used that to calculate a hotter temperature for the heat source itself. That may have made sense, giving his (incorrect) assumption about how "power in = power out" worked. BUT... he got a value for temperature almost 100 degrees F hotter than before.

Remember the S-B law? That means the POWER output of that heat source was much greater. It doesn't matter where it was coming from... according to his own reasoning (which would be correct for the heat source itself), it can only be as hot as the power that is input lets it. Power out p = (epsilon)(sigma)T^4. Period. No two ways about it. So if there is a greater T, there is higher power output, and it has to come from somewhere. His heat source is going to draw more power from whatever is powering it.

But wait! There's more!

All he had to do was continue this magical thinking. Now transfer this power out back to the outside of the enclosing sphere, the way he did it the first time. Then he can back-calculate, the same way he did the first time, and get an even HOTTER figure for the heat source. Then he can transfer this power back out to the outside of the enclosing sphere again, and continue ad infinitum!

It's hilarious, because khayman80 accused me of spreading "civilization-paralyzing misinfomation". But if the universe really worked according to the information HE has been spreading, it would result in a thermal runaway and destroy itself in an extremely brief period of time. For the price of a few kilowatts.

khayman80, otherwise known as Bryan Killett, you're either a liar of a fool. As I said before, I don't know which, but I've proved that it MUST be one of the two.
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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

  by Jane Q. Public (1010737) Friend of a Friend on 2014-09-10 21:27 (#47877649)

  Jane's obligations include continuing to spread misinformation about ocean acidification even after I've repeatedly debunked him.

  So I predict that Jane's answer won't include any equations that could be used to calculate the enclosed source temperature. Instead, he'll probably grace us with another lengthy, incoherent rant about "problems" in my analysis which are (as usual) too vague to be expressed in equations. In the extremely unlikely event that Jane musters up the courage and competence to actually write down an equation that could be used to calculate the enclosed source temperature, it will almost certainly violate conservation of energy.

  Wrong again. Or perhaps I should say STILL.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

  by Jane Q. Public (1010737) Friend of a Friend on 2014-09-10 22:00 (#47877767)
  Another minor correction: I stated that "the difference in area" between 2 and 3 was only about 0.001, or some such. That was not quite correct. What I meant was in the process of doing my calculations, I discovered that the difference ***made by*** the difference in area was only about 0.001. So I determined that it could safely be ignored, given the fairly loose precision of our other calculations.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-10 22:14 (#47877813) Homepage Journal

> We now insert our hollow sphere (somehow, suddenly and magically, it doesn't matter, this is assumed) which fully encloses the heat source. It is 7mm away from the heat source, and it is 7mm away from the wall. And we let things come back up to radiative steady-state.
>
> And now, to do this properly, we must make a bit of a mental leap, which may be difficult for some people: the **total** heat transfer now from heat source to the chamber wall is equal to: (heat transfer from heat source to the inside of the enclosing plate) **PLUS** (heat transfer from the outside of the enclosing plate to the wall).
>
> This is a place where "thermodynamic thinking" will mess you up. Some people will insist that the TOTAL heat transfer must take place between EACH object. But that is simply not true. This was CLUE #3: a quote from a heat transfer engineering textbook about how "thermodynamic thinking" will lead one astray. ***[Jane Q. Public, 2014-09-10]***

As I said, in the unlikely event that you wrote down equations, they'd violate conservation of energy. Thermodynamic thinking like this leads one back to reality, not astray. Draw a boundary inside the inner surface of the enclosing shell at your steady-state values. Since nothing inside that boundary is changing, power in = power out. But that's completely impossible. Your solution violates conservation of energy, as predicted.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-10 22:14 (#47877817)
Holy crap, I just discovered another error. Pardon me, folks, but despite khayman80's nasty remarks elsewhere, I really have been busy. Between work, doing work on the car that **had to** be done today, and schooling a physicist on why his physics is awful, I've been very, very busy.

This is what I wrote:

Think of it this non-tecnical way: radiant heat transfer is a function of difference in temperatures. If you have two differences, A = X - Y and B = Y - Z, then A - Z = (X - Y) plus (Y - Z).

What I meant was this:

Think of it this non-tecnical way: radiant heat transfer is a function of difference in temperatures. If you have two differences, A = X - Y and B = Y - Z, then (A + B) = (X - Z).

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-10 22:22 (#47877845)

As I said, in the unlikely event that you wrote down equations, they'd violate conservation of energy. Thermodynamic thinking like this leads one back to reality, not astray. Draw a boundary inside the inner surface of the enclosing shell at your steady-state values. Since nothing inside that boundary is changing, power in = power out. But that's completely impossible. Your solution violates conservation of energy, as predicted.

Violating conservation of energy is something you do quite well, you complete bozo.

You ASSUMED that power at the surface of the heat source = power at the outer surface of the hollow sphere. You did NOT take into account that the sphere radiates from BOTH surfaces. You can even fucking add 2 + 2.

THEN, you neglected to do the most basic check of your work, such as: applying the S-B relation to your new, hotter heat source. You just hoist yourself by your own petard, dude, because our input is a FIXED amount of power, but you upped your output by almost 100 degrees F. Draw your line JUST around your heat source. Where is that extra power coming from? S-B law says that power is ONLY related to temperature and emissivity, and the emissivity hasn't changed.

So where is that extra power coming from? Thin goddamned air?

I made a couple of very minor errors, which I have corrected. My basic proof still stands, and you are still wrong.

In fact, you're a complete loon.

I either included or referenced all the equations that were necessary to solve the problem. It's not my fault if you still can't do it.

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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-10 22:23 (#47877859)
s/you can even add/you can't even add

My keyboard needs cleaning.
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- **Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-10 22:28 (#47877877)
Further, if you have a problem with my equations (including my minor corrections) you are welcome to do your own and prove me wrong.

But you aren't going to, because I'm not wrong, in any basic way. I might have gotten a hundredth or a thousandth off here or there, but unlike you I did double-check your work. All while (according to you) I was spouting something off on Facebook or something.

I spent about an hour and a half on this, give or take, between my regular work, and working on the car. That includes identifying your errors, and determining what the right way to do it was.
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- **Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)**

by khayman80 (824400) on 2014-09-10 22:32 (#47877893) Homepage Journal
In all that time, did you ever consider drawing a boundary between the source and the enclosing shell at your proposed steady-state temperatures, then calculating power in = power out using the original constant electrical power you calculated before the source was enclosed?

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-10 23:57 (#47878133)
One more correction and again it's minor, but again I plea that I have been very busy and had to dash this off in a hurry:

In my list of "clues" toward the bottom, Clue #1:

The bit about "Barring any issues like 'view factor'" was an irrelevant comment because that relates to interactions between bodies and my whole point was that the S-B equation for radiative power from a body does not include other bodies. The part about "view factor" can be left out of that passage without affecting its correctness.
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-11 0:02 (#47878149) Homepage Journal
But again, did you ever consider drawing a boundary between the source and the enclosing shell at your proposed steady-state temperatures, then calculating power in = power out using the original constant electrical power you calculated before the source was enclosed?
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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-11 0:24 (#47878205)
We have already shown that your particular application of "drawing boundaries" here was a MISAPPLICATION of the principle you are trying to use.

The "enclosing shell" (if by that you mean the passive plate that was inserted) is acted upon only by radiation. You should have drawn your shell around THAT, and that alone. And you should at least have tried drawing your boundary around your own goddamned heat source, both for initial conditions and your final result, to check your work. But you didn't. What you got was a universe-busting violation of conservation of energy.

But of course you are still trying to defend something which YOU claimed earlier is not valid to do. There is a word for that.

Face it. You've been spouting the wrong answer for 2 years, and using it to justify calling OTHER PEOPLE names, and bullying them online, and other nasty antisocial behavior.

But even if I made a small mistake somewhere (I did NOT make a large one), you're still busted.
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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-11 0:43 (#47878263)
s/should have drawn your shell/should have drawn your boundary
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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-11 1:01 (#47878327) Homepage Journal

> We have already shown that your particular application of "drawing boundaries" here was a MISAPPLICATION of the principle you are trying to use. ... ***[Jane Q. Public, 2014-09-10]***

Jane agreed that the general principle is true that power in = power out through a boundary where nothing inside the boundary is changing. But now that this general principle contradicts Slayer dogma, Jane considers it a misapplication.

Jane might wonder why cooler power wasn't included in "power in = power out": because it just moves energy from one point outside the boundary to another point that's **also** outside the boundary. In the same way, energy moved from one point **inside** the boundary to another point that's **also** inside the boundary isn't included in the equation describing conservation of energy.

> ... You should have drawn your shell around THAT, and that alone. And you should at least have tried drawing your boundary around your own goddamned heat source, both for initial conditions and your final result, to check your work. But you didn't. What you got was a universe-busting violation of conservation of energy. ... ***[Jane Q. Public, 2014-09-10]***

Ironically, power in = power out through all the boundaries I've constructed. That includes the boundary around my own "goddamned heat source". But that's not true for Jane's solution, because it violates conservation of energy.

> ... The rate of energy transfer from surface 1 to 2 is (p12) = (e*s) * (T1^4 - T2^4). And T1 is known! ... (e*s) * (338.71^4 - T2^4) ... ***[Jane Q. Public, 2014-09-10]***

The enclosed source temperature at steady state is known to be 338.71 K (150F)? No, absolutely not. The chamber wall temperature is constant at 0F, and the electrical power heating the source is constant. But the enclosed source temperature is only constant in Jane's PSI Sky Dragon Slayer bizarro world.

Jane **assumed** the source's final enclosed steady state temperature was exactly the same as before it was enclosed. Surprise, Jane found that the source didn't warm! As a result, he got nonsensical answers and had to invent a new energy conservation law where power adds to the energy inside a boundary even if it never crosses that boundary.

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Re:Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by Jane Q. Public (1010737) Friend of a Friend on 2014-09-11 1:11 (#47878353)
But again: if you need to "draw a boundary", it needs to be drawn around **the passive plate itself**. We have already firmly established that your "boundary" around the heat source and the "enclosing shell" is even thermodynamically incorrect. It leads to an erroneous result of very close to (within a few thousandths) DOUBLE the radiative power from that surface that actually exists.

I have explained this to you 3 times now. If you can't get it through your head, that's your problem and nobody else's.

As I said, I am going to write this up more thoroughly, elsewhere. But I have presented enough here for anybody who is really interested to figure it out without too much difficulty. Present company apparently excepted.

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Jane/Lonny Eachus goes Sky Dragon Slayer (Score:2)

by khayman80 (824400) on 2014-09-11 1:23 (#47878393) Homepage Journal

> ... if you need to "draw a boundary", it needs to be drawn around **the passive plate itself**. We have already firmly established that your "boundary" around the heat source and the "enclosing shell" is even thermodynamically incorrect. ... ***[Jane Q. Public, 2014-09-11]***

Good grief. How predictably ridiculous. **All boundaries** where nothing inside changes have power in = power out. Seriously. **All of them.** That's why I tried to convince you that this general principle is true, but obviously we'll have to agree to disagree.

> We have already shown that your particular application of "drawing boundaries" here was a MISAPPLICATION of the principle you are trying to use. ... ***[Jane Q. Public, 2014-09-11]***

Jane agreed that the general principle is true that power in = power out through a boundary where nothing inside the boundary is changing. But now that this general principle contradicts Slayer dogma, Jane considers it a misapplication.

Jane might wonder why cooler power wasn't included in "power in = power out": because it just moves energy from one point outside the boundary to another point that's **also** outside the boundary. In the same way, energy moved from one point **inside** the boundary to another point that's **also** inside the boundary isn't included in the equation describing conservation of energy.

> ... You should have drawn your shell around THAT, and that alone. And you should at least have tried drawing your boundary around your own goddamned heat source, both for initial conditions and your final result, to check your work. But you didn't. What you got was a universe-busting violation of conservation of energy. ... ***[Jane Q. Public, 2014-09-11]***

Ironically, power in = power out through all the boundaries I've constructed. That includes the boundary around my own "goddamned heat source". But that's not true for Jane's solution, because it violates conservation of energy.

> ... The rate of energy transfer from surface 1 to 2 is (p12) = (e*s) * (T1^4 - T2^4). And T1 is known! ... (e*s) * (338.71^4 - T2^4) ... ***[Jane Q. Public, 2014-09-10]***

The enclosed source temperature at steady state is known to be 338.71 K (150F)? No, absolutely not. The chamber wall temperature is constant at 0F, and the electrical power heating the source is constant. But the enclosed source temperature is only constant in Jane's PSI Sky Dragon Slayer bizarro world.

Jane **assumed** the source's final enclosed steady state temperature was exactly the same as before it was enclosed. Surprise, Jane found that the source didn't warm! As a result, he got nonsensical answers and had to invent a new energy conservation law where power adds to the energy inside a boundary even if it never crosses that boundary.

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Re:Interesting slam of Judith Curry (Score:0)

by BasilBrush (643681) Friend of a Friend on 2014-08-27 12:03 (#47767901)

Do you always believe what other people say, as long as it fits your pre-conceived notions?

khayman80's links are to your own posts, claiming Obama's birth cert to be a fake.

Of course it may be that you no longer belive in the conspiracy theory you used to expound. But denying it just makes you a liar. And reflects on the nonsense you post on other topics, such as AGW.

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