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# ***Interactive comment on “Ice melt, sea level rise and superstorms: evidence from paleoclimate data, climate modeling, and modern observations that 2 °C global warming is highly dangerous” by J. Hansen et al.***

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Nabil Swedan: So you are saying that matter does not radiate EM energy at terrestrial temperatures or else IR astronomy does not work?

A simple study of the science would allay your misconceptions. This can be found at: [https://en.wikipedia.org/wiki/Infrared\\_astronomy](https://en.wikipedia.org/wiki/Infrared_astronomy)

"The principal limitation on infrared sensitivity from ground-based telescopes is the

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Earth's atmosphere. Water vapor absorbs a significant amount of infrared radiation, and the atmosphere itself emits at infrared wavelengths. For this reason, most infrared telescopes are built in very dry places at high altitude, so that they are above most of the water vapor in the atmosphere. Suitable locations on Earth include Mauna Kea Observatory at 4205 meters above sea level, the Paranal Observatory at 2635 meters in Chile and regions of high altitude ice-desert such as Dome C in Antarctic. Even at high altitudes, the transparency of the Earth's atmosphere is limited except in infrared windows, or wavelengths where the Earth's atmosphere is transparent. The main infrared windows are listed below:"

FYI: Not all terrestrial IR is back-radiated by the atmosphere - there is a thing called the "IR window", where some IR can escape to space freely. (It is how IR channels can see the Earth's clouds and use that to infer cloud top temps. If that were not the case then the pics would be fuzzy and unusable.

This from an astronomy forum: "The major culprit in absorbing IR is water vapor (which is why it's by far the dominant greenhouse gas on Earth). Some slices of the IR can be observed usefully from aircraft (i.e. SOFIA) or much higher, high-altitude balloon payloads. However, the 0.1-0.4mm range (100-400 microns) still requires space platforms for effective use. On the other side of the window toward microwaves, there are atmospheric windows around 450, 700, 850 microns that can be used from very high and dry sites on the ground when the weather is favorable - the Altiplano of northern Chile, Mauna Kea, the South Pole."

As to your simply observing the GHE in action, as I described in my first post, I must add that I am a retired meteorologist and observed the GHE in action as a matter of routine, indeed the physics is used in order to forecast surface temps. You could buy an IR thermometer and point at the night sky. Do it when it's cloudy and when it's clear. Observe the difference.

It's what scientists have done/do do - the GHE is empirical science. Known of for ~150

years. Without it the Earth's surface temperature would be  $\sim 33\text{C}$  colder (around  $-18\text{C}$ ). Finally here is an article by Roy Spencer (skeptical climatologist) slaying the "slayers" about the GHE: <http://www.drroyspencer.com/2010/08/help-back-radiation-has-invaded-my-backyard/>

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