

Topic 13: Solar Forcings

Does the sun exhibit fusion or fission? What's the difference?

What fuel does the sun “burn”, and what does it get turned into?

Explain the cascade from original fuel to final product of the sun

What layer do astronomers “filter out” to view sunspots?

What layer of the sun do sunspots show up as dark blotches?

What kind of cyclicity has been detected in total solar irradiance

What causes the solar cycles?

Explain how sunspot records and satellite data of TSI are used to reconstruct past TSIs

What is notable, regarding global warming, about TSI since the early 1970s?

What do astronomers mean by the “Goldilock Zone”?

What does perihelion and aphelion mean?

Looking at the Northern Hemisphere Winter, how is it evidence that the Earth-Sun distance plays no current role in the seasonal changes of our planet?

Which planets primarily driver changes in the Earth’s orbit’s eccentricity?

Discuss two ways in which eccentricity changes are often incorrectly shown in textbooks or online

What happens to the distance: aphelion + perihelion during eccentricity changes?

By how much does the Earth’s tilt vary through time?

Explain why the Earth’s tilt is SO MUCH more important to our seasons, than current eccentricity

Why does the influence of solar distance become stronger on our planet when the Earth’s orbit is more eccentric?

Explain precession

Precession by itself has no impact on insolation. Explain how, combined eccentricity it does, especially during times that the Earth has a highly eccentric orbit

What star HAPPENS to be near the point in space towards which the Earth’s axis is currently pointing?

Explain how a combination of Milankovitch forcings have driven glacial and interglacial periods over the past 2.4 million years

Why are we absolutely certain that Milankovitch cycles have not the rapid warming of our planet during the latter part of the 20th century and early 21st century (and even back to the last “Ice Age”)?

How do models support the conclusion that solar forcings (TSI and Milankovitch cycles) cannot explain current global warming?

