

Iron Snow on Earth's Inner Core

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Recently a study claimed that earth's inner core is made out of iron snow

Key observations

- According to the **study, published in the journal JGR Solid Earth**, the iron-snow falls from the molten outer core, and piles up on top of the inner core, creating stacks up to 200 miles thick which cover the innermost layer of the planet.
- **The researchers, including those from the University of Texas at Austin in the US, studied this layer by recording and analysing signals from seismic waves as they passed through the Earth.**
- In doing so, they **found variations between recent seismic wave data, and the values they expected** based on mathematical models of the Earth's core, raising new questions.
- One of **their observations was that the seismic waves moved much slower than expected when they passed through the base of the outer core**, and they moved faster than estimates as they passed through the eastern hemisphere of the top inner core.
- Based on these findings, **the study proposed the iron snow-capped core as an explanation for these aberrations.**
- **Earlier studies had pointed that a slurry layer exists between the inner and outer core**, however the existing knowledge at that time about heat and pressure conditions in the core quashed that theory
- With new data from experiments on core-like materials, the scientists found that crystallisation was possible

and that about 15 per cent of the lowermost outer core could be made of iron-based crystals.

- They said these could eventually fall down the liquid outer core and settle on top of the solid inner core.
- According to the researchers, accumulated snow pack may be the cause of the seismic aberrations.
- They said the slurry-like composition of the snow pack slows the seismic waves in such a way that the variation in snow pile size – thinner in the eastern hemisphere and thicker in the western – affected the speed of the waves.

1. **The Earth's core has never been sampled, thus scientists try to study it by analysing signals from seismic waves.**
2. The Earth's core has a major influence over phenomena that affects the entire planet, which includes generating its magnetic field to radiating the heat that drives the movement of tectonic plates. Understanding the core and its composition, can help us understand how these processes work.