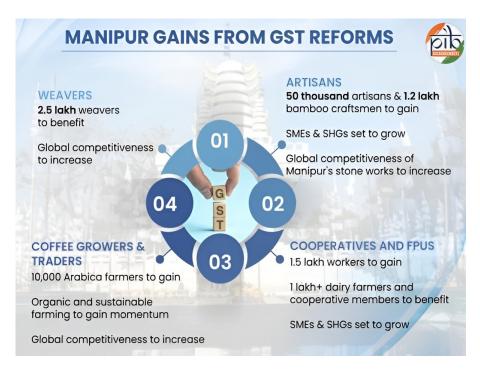


## Iron in Sun

## Why in the news?

New research is finding that theories of atomic physics have underestimated iron's contribution to the sun's temperature profile.

- Iron in Sun Iron (Fe) makes up about 0.14% of the Sun's mass, which is a small fraction compared to hydrogen ( $\sim$ 74%) and helium ( $\sim$ 24%).
- **Location** Iron is found mostly in the <u>Sun's core and outer layers (photosphere, corona)</u> in ionized forms.



- **Source** Iron in the Sun comes from *nucleosynthesis in earlier generations of stars*, which exploded as supernovae and contributed elements to the solar system.
- Role in Opacity Iron plays a crucial role in *absorbing and scattering radiation*, influencing energy transfer within the Sun.
- Role in Temperature Profile Iron opacity affects <u>temperature</u>, <u>density and fusion</u> <u>rates</u> inside the Sun.
- So, the new findings of higher opacity of iron in the sun impacts the present solar models.

Composition of the Sun		
Element	By Mass (%)	Key Role
Hydrogen (H)	1/4%	Primary fuel for nuclear fusion, produces energy.
Helium (He)	24%	Fusion product, contributes to Sun's stability.

Oxygen (O)	1~U 8%	Influences solar opacity, involved in energy transport.
Carbon (C)	~0.3%	Important in nucleosynthesis, affects opacity.
Neon (Ne)	1~11 /%	Present in the solar atmosphere, influences radiation absorption.
Iron (Fe)	1~11 1/1 <sup>9</sup> / <sub>2</sub>	Major contributor to opacity, affects energy transfer.

## Reference

The Hindu | iron inside the sun is more opaque than expected

