

## 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 (~74%) and helium (~24%).
- **Location** - Iron is found mostly in the Sun's core and outer layers (photosphere, corona) in ionized forms.

### Ancient Monuments & Archaeological Sites and Remains Act, 1958

**Purpose**  
Protect and preserve monuments & archaeological sites of national importance

**Covers**

- ✓ Immovable Heritage
- Monuments
- Sites
- Structures

**Key Provisions**

- Declaration of protected monuments
- Regulation of construction near sites
- Control over excavations

**Protection Zones**

- 100 m → Prohibited Area
- 200 m → Regulated Area

**Implemented by**

- Archaeological Survey of India (ASI)
- National Monuments Authority (NMA)

### Antiquities & Art Treasures Act, 1972

**Purpose**  
Prevent smuggling, illegal trade & export of antiquities

**Covers**

- ✓ Movable Heritage
- Artefacts
- Sculptures
- Antiquities

**Key Provisions**

- Mandatory registration of antiquities
- Licensing of dealers
- Regulation of ownership & trade

**Focus**

- Prevent illegal export
- Safeguard cultural property

**Implemented by**

- Archaeological Survey of India (ASI)

- **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 temperature, density and fusion rates 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)	74%	Primary fuel for nuclear fusion, produces energy.
Helium (He)	24%	Fusion product, contributes to Sun's stability.

<b>Oxygen (O)</b>	~0.8%	Influences solar opacity, involved in energy transport.
<b>Carbon (C)</b>	~0.3%	Important in nucleosynthesis, affects opacity.
<b>Neon (Ne)</b>	~0.2%	Present in the solar atmosphere, influences radiation absorption.
<b>Iron (Fe)</b>	~0.14%	Major contributor to opacity, affects energy transfer.

## Reference

[The Hindu | iron inside the sun is more opaque than expected](#)

