Mercury's Contraction

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Why in News?

A new study published in Geophysical Research Letters suggests that Mercury may have contracted by up to 23 km in diameter, around 30% more than previous estimates.

- Researchers conducted a comparison of the following elements:
  - Maps depicting **contraction-related faults and associated geological features**
  - Maps illustrating variations in **surface roughness**

- The analysis revealed that certain regions characterized by **higher surface roughness** exhibited fewer observable contraction features.
- The findings could help scientists understand Mercury's long-term thermal and geological evolution.
- Fresh observations from **BepiColombo** may provide further evidence.

BepiColombo Mission

- **BepiColombo** is a collaborative mission between the **European Space Agency (ESA) and the Japan Aerospace Exploration Agency (JAXA)** aimed at exploring Mercury.
- The mission includes two spacecraft.
    - **Mercury Planetary Orbiter (MPO),** developed by **ESA.**
    - **Mercury Magnetospheric Orbiter (Mio),** developed by **JAXA.**
- The spacecraft will study *Mercury's surface, interior, magnetosphere, magnetic field, and geological evolution.*
- BepiColombo's **laser instrument** is expected to provide data to help determine the

extent of Mercury’s contraction as its interior cools.

Earlier Mercury Missions		
Mariner 10	NASA	First spacecraft to visit Mercury; 1970s
MESSENGER	NASA	Studied Mercury extensively; 2010s
BepiColombo	ESA + JAXA	Detailed investigation of Mercury; ongoing

Mercury
• Mercury is the **smallest planet** in the Solar System. • It is the **closest planet to the Sun**. • Mercury possesses a disproportionately **large iron core** relative to its overall size. • The planet has been undergoing **gradual contraction** as its interior cools. • Mercury's surface is heavily affected by **impact cratering**. • This contraction produces geological features such as faults and scarps. • **Mercury does not have any natural satellites**. • Despite being a small rocky planet, Mercury possesses a global magnetic field.

Reference

India Today | Mercury’s Contraction

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