Diyodar meteorite was India's first aubrite in 170 years

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In news– Meteorite streaked over India in August, 2022, breaking apart as it descended through the air, to scatter over two villages in Banaskantha, Gujarat was India's first aubrite in 170 years.

About Diyodar meteorite

- It stuck over two villages in Banaskantha of Gujarat, one piece struck a neem tree in Rantila village and shattered into several pieces. Another landed on the porch of a house in Ravel village, 10 km away, and met a similar fate.
- Analysis by a group of scientists at the Physical Research Laboratory (PRL), Ahmedabad, has revealed that this **meteorite is a "rare, unique specimen" of aubrite**.
- India has been the site of hundreds of meteorite crashes, **but this is only the second recorded crash of an aubrite. The last was on December 2, 1852, in Basti, Uttar Pradesh.**
- **Worldwide, aubrites have crashed in at least 12 locations since 1836,** including three in Africa and six in the U.S.
- According to the 'Encyclopedia of Physical Science and Technology' (2003), **aubrites "are coarse-grained igneous rocks that formed" in oxygen-poor conditions,** and thus "**contain a variety of exotic minerals that are not found on Earth**".

- **For example, the mineral heideite was first described in the Basti meteorite.**

- **Meteors are pieces of some solid object in space that broke away, descended onto a planet or moon,** and managed

to reach the surface.

- **Once on the surface, they are called meteorites**. **Aubrites are a type of meteorite;** scientists are not yet sure of their origin, although some signs indicate that they could be from the asteroid 3103 Eger or from the planet Mercury.
- **The pieces that fell in the two villages have been dubbed the Diyodar meteorite, after the taluka in which the villages are located.**
- The PRL group obtained two fragments weighing 200 g and 20 g. They used a gamma-ray spectrometer, a spectroradiometer, electron-imaging, and chemical analyses to determine their mineral composition.
- **They found that the fragments shared a crust that indicated they were part of the same larger rock.**
- **Around 90% of the meteorite was composed of orthopyroxene**.
- **Pyroxenes are silicates consisting of single chains of silica tetrahedra** (SiO 4); orthopyroxenes are pyroxenes with a certain structure.
- **Pyroxenes such as diopside and jadeite have been used as gems.**
- **Spodumene was historically used as lithium ore.** Rocks with pyroxene have also been used to make crushed stone that is used in construction.
- They also noted that the pyroxene didn't contain any iron but was rich in magnesium.
- **The group also classified the meteorite as a monomict breccia, meaning that it consisted of several pyroxene-bearing pieces** held together by a scaffold of rocky material.
- Overall, they suggested that the meteorite is an aubrite.
- **The conditions in which aubrites form are prevalent on the surface of Mercury**; however, the researchers wrote that they "don't have any known Mercurian samples in our collection".

- So, they continued, the Diyodar meteorite “not only improves the existing meteoritic database but will be important for understanding planetary processes in the future.”