

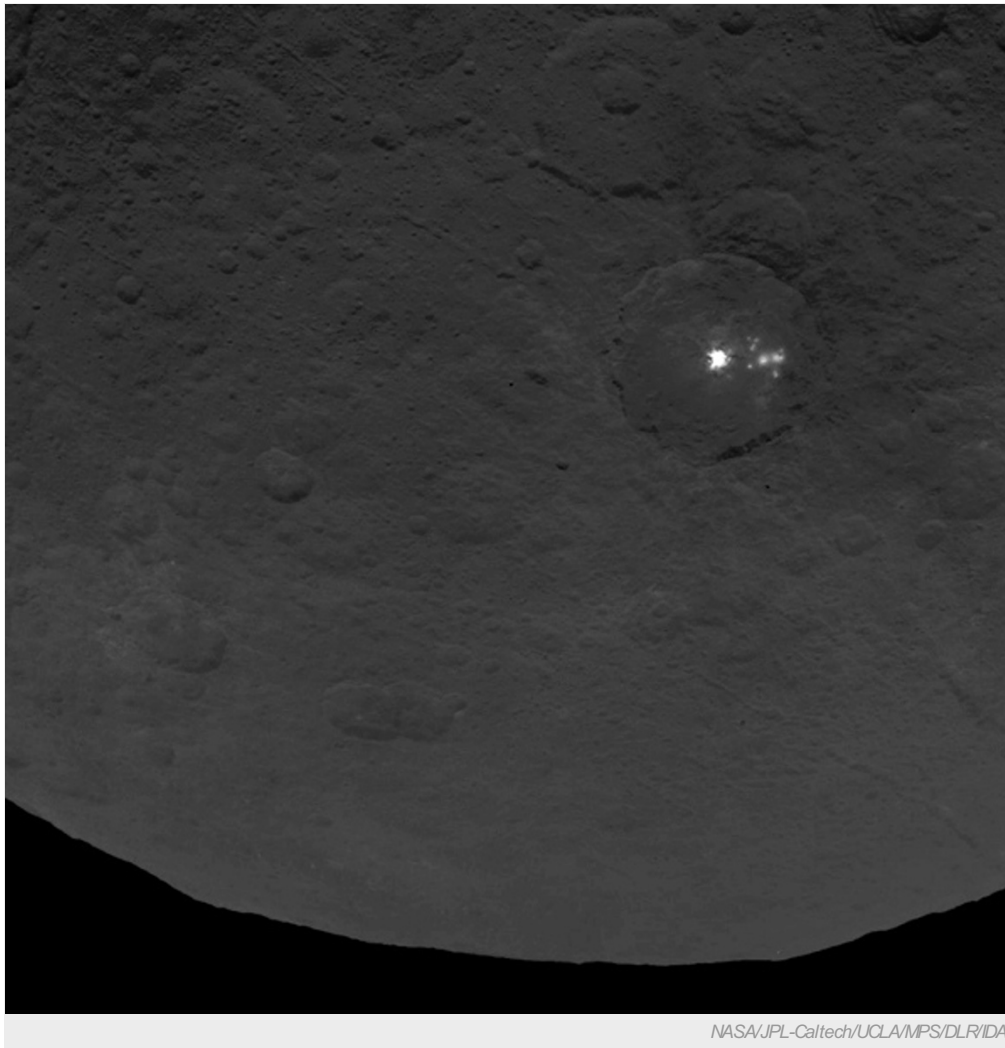
# Intriguing geology of Ceres revealed in new pictures

NASA mission shows dwarf planet's surface in rich detail.

Alexandra Witze

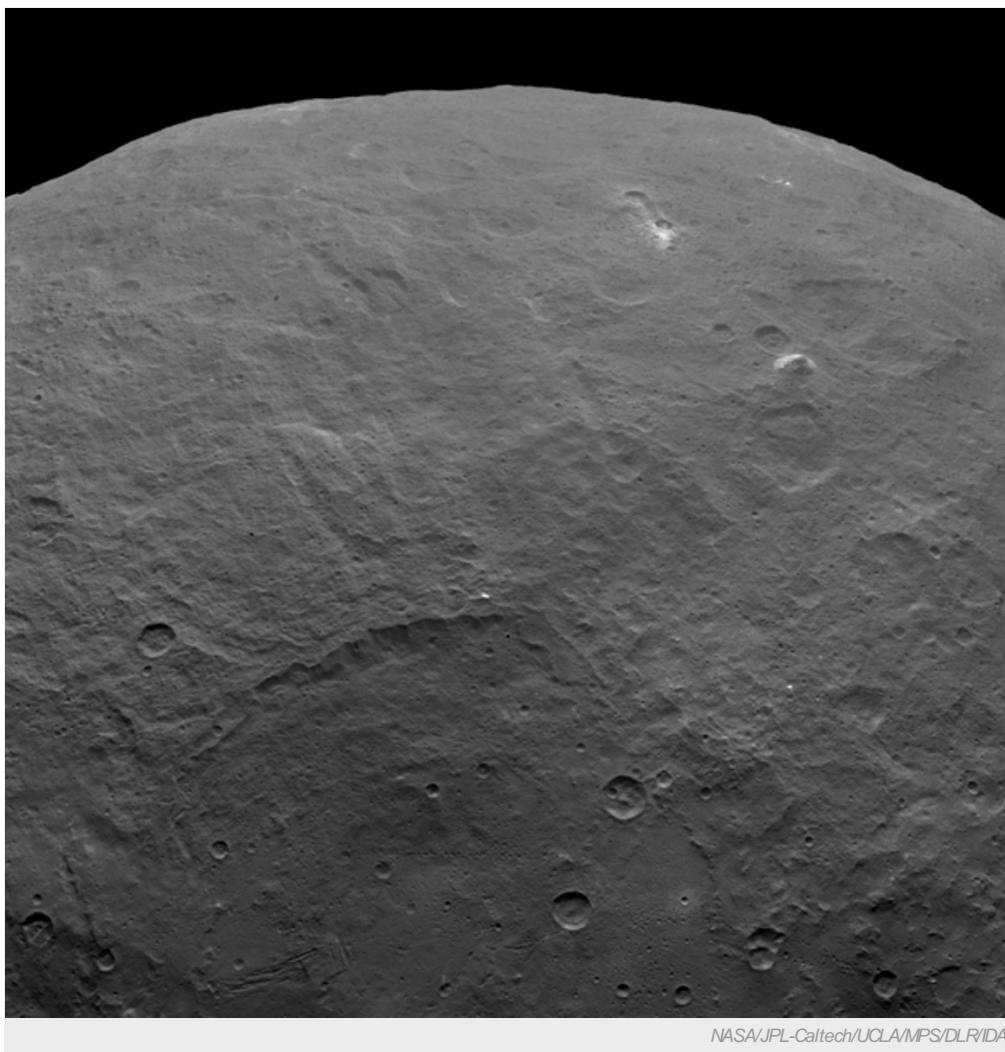
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Ceres, the largest asteroid in the Solar System, is finally getting its close-up. [NASA's Dawn spacecraft](#) arrived in March, and is now taking photographs from as close as 4,400 kilometres above the asteroid's surface. Craters and mountains are coming into view, but [the bright spots that dapple Ceres's surface](#) remain its most mysterious feature.



## A tantalizing puzzle

A central, 9-kilometre-wide bright spot in a 90-kilometre-wide crater is accompanied by a cluster of smaller reflective spots off to the right. The spots could be made of ice, salt or another type of bright material, yet to be fully understood. Data from a neutron detector on the spacecraft, which could help to answer the question, take some time to accumulate. Ceres — technically a dwarf planet — is thought to consist of at least one-quarter water; craters with ice-rich peaks are common on other bodies in the Solar System, such as Jupiter's moons Ganymede and Callisto.



NASA/JPL-Caltech/UCLA/MPS/DLR/IDA

### **Majestic peak**

A pyramid-shaped mountain (centre right) rises 5 kilometres high from an otherwise unremarkable portion of the asteroid's surface. "The hill is crazy," says Andrew Rivkin, a planetary scientist at the Johns Hopkins University Applied Physics Laboratory in Laurel, Maryland. Elsewhere in the Solar System, mountains are usually associated with fractured or geologically active areas.

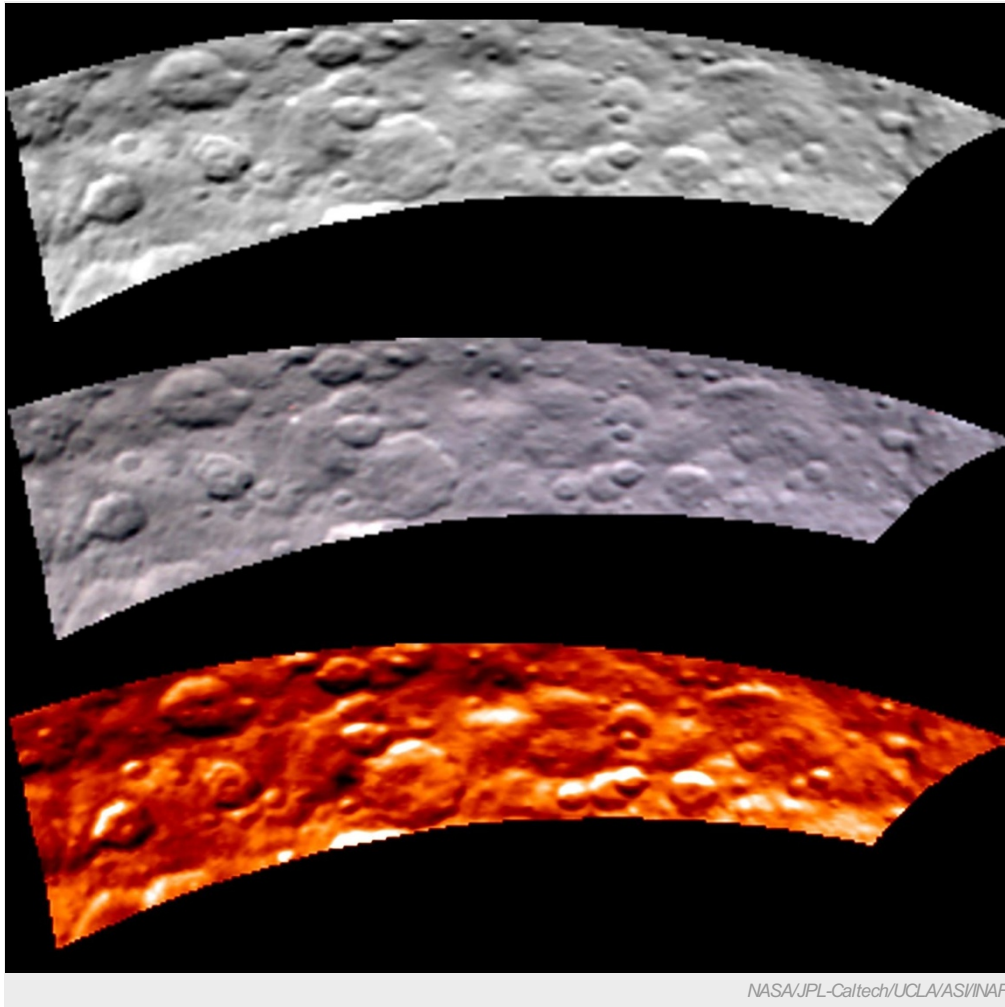


NASA/JPL-Caltech/UCLA/MPS/DLR/IDA

### **Deep impact**

A large impact crater (lower right) in the southern hemisphere of Ceres shows a complex series of fractures, all probably related to whatever object pummelled the asteroid and left behind this blemish. To the left, two semi-curved streaks run parallel to one another,

for reasons still unknown. Mission scientists say that Ceres seems to have more geological activity than does the asteroid Vesta, [which Dawn visited](#) in 2011–12.



**Colour up close**

Ceres is notoriously dark, but a colour camera aboard Dawn snapped this sequence of a cratered region in the asteroid's northern hemisphere. At the centre is a true-colour view showing its dark surface. At the top is a black-and-white version processed to bring out contrast in the craters. At the bottom is a near-infrared image in which the brightest areas are the warmest and the darkest areas the coolest.

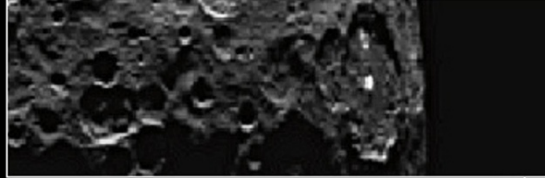
## THAT'S NO MOON!

The asteroid Ceres, some 950 kilometres across, is coming into sharper view as NASA's Dawn mission gathers data. Key science questions about this rocky world include what makes it different from planets and other asteroids.

**ICE** Ceres is thought to be at least one-quarter frozen water, a higher percentage than in other asteroids.

**INTERNAL STRUCTURE** Early in its history, Ceres could have separated into different internal layers, including a rocky core like that of Earth.

**BRIGHT SPOTS** Mysterious glints could be light-coloured ice, or something else yet to be understood.



**SURFACE COMPOSITION** Ceres's notably dark-coloured surface needs to be mapped into areas of different chemical composition before scientists can start to unravel its geological history.

**CRATERS** Fewer large craters appear here than on another large asteroid, Vesta. Could the large amount of ice have caused Ceres's surface to relax and flatten?