

not impossible, compared to three years ago, when people were thinking this computation was infeasible,” Jiang says.

But some data custodians remain sceptical about encryption. Steven Sherry, chief of the reference collections section at the US National Center for Biotechnology Information in Bethesda, Maryland, manages dbGaP. He says that cryptography, even if it worked,

would not necessarily protect data on researchers’ computers or give them enough analytical flexibility. He instead favours restricting access to a small circle of scientists and asking them to certify that they will abide by rules and regulations on how the data can be used. “We haven’t looked at cryptographic methods,” says Sherry, “because it hasn’t been demonstrated to us that they’re both secure and useful.” ■

SPACE

Bright spots hint at active ice on Ceres

Early data from Dawn spacecraft bring scientists closer to clearing up mystery about dwarf planet.

BY ALEXANDRA WITZE, THE WOODLANDS, TEXAS

A pair of bright spots glimmering inside an impact crater on the dwarf planet Ceres, mystifying scientists, could be coming from some kind of icy plume or other active geological feature.

Images from NASA’s Dawn spacecraft show the spots, known as ‘feature number 5’, at changing angles as the dwarf planet rotates into and out of sunlight. The pictures reveal the spots even when they appear near the edge of Ceres, when the sides of the impact crater would normally block the view of anything confined to the bottom. That something is visible at all from that angle suggests that the feature must rise relatively high above the surface.

“What is amazing is that you can see the feature while the rim is still in the line of sight,” said Andreas Nathues, a planetary scientist at the Max Planck Institute for Solar System

Research in Göttingen, Germany. Nathues, who leads the team for one of the Dawn cameras, revealed the images on 17 March at the Lunar and Planetary Science Conference in The Woodlands, Texas.

At dawn on Ceres, feature number 5 appears bright. By dusk, it seems to fade. That could mean that sunlight plays an important part — for instance, by heating up ice just beneath the surface and causing it to blast off some kind of plume or other feature.

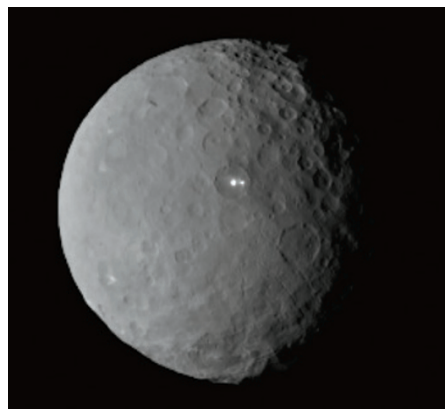
Ceres, one of the largest unexplored worlds in the Solar System, is believed to be at least one-quarter ice — a greater proportion than most asteroids. Dawn, which launched in 2007, aims to work out where that ice resides and what role it has in shaping the dwarf planet’s surface. One idea is that the ice is blanketed by a very thin layer of soil. The ice may occasionally squirt up in towering ‘cryovolcanoes’, thanks to internal pressures in the asteroid.

Dawn is currently looping back towards Ceres after being captured by its gravity on 6 March. As the spacecraft gets closer to the dwarf planet, it will take more pictures to see how its surface might be changing. “The big question is whether Ceres has an active region — or more than one,” Nathues says.

Christopher Russell, a planetary scientist at the University of California, Los Angeles, and Dawn’s principal investigator, says that towards the end of its mission the spacecraft will map Ceres at high enough resolution to see features that are just 30 metres across. The hope is that the possible icy plume will come into focus and reveal its true nature.

“We hope to show that Ceres is every bit a planet, as much as its terrestrial neighbours Mars, Earth, Venus and Mercury are,” Russell says. ■

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



The Dawn spacecraft captured this image of Ceres’ twin bright spots on 19 February.