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‘NASA’S HISTORIC DAWN MISSION TO ASTEROID BELT COMES TO END’

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This illustration made available by NASA depicts the Dawn spacecraft orbiting the dwarf planet Ceres. File | Photo Credit: AP

NASA’s pioneering Dawn spacecraft — which orbited the two largest objects in the asteroid belt — has run out of fuel, ending a historic 11-year mission that unravelled many mysteries of our solar system, the US space agency said.

The USD 467 million Dawn mission, launched in 2007 to study the protoplanet Vesta and the dwarf planet Ceres, missed scheduled communications sessions with NASA’s Deep Space Network on October 31 and November 1, NASA said in a statement.

After the flight team eliminated other possible causes for the missed communications, mission managers concluded that the spacecraft finally ran out of hydrazine, the fuel that enables the spacecraft to control its pointing.

“Today, we celebrate the end of our Dawn mission — its incredible technical achievements, the vital science it gave us, and the entire team who enabled the spacecraft to make these discoveries,” said Thomas Zurbuchen, associate administrator of NASA’s Science Mission Directorate here.

“The astounding images and data that Dawn collected from Vesta and Ceres are critical to understanding the history and evolution of our solar system,” Mr. Zurbuchen said.

It was an expected end to the mission, although the spacecraft lasted two years longer than originally planned.

On Tuesday, NASA announced that its exoplanet-hunting Kepler Space Telescope had run out of hydrazine fuel, and the craft would be commanded to cease operations.

Dawn can no longer keep its antennae trained on Earth to communicate with mission control or turn its solar panels to the Sun to recharge, according to the US space agency.

The spacecraft launched 11 years ago to visit the two largest objects in the main asteroid belt. Currently, it is in orbit around the dwarf planet Ceres, where it will remain for decades, NASA said.

Dawn launched in 2007 on a journey that put about 6.9 billion kilometers on its odometer. Propelled by ion engines, the spacecraft achieved many firsts along the way.

In 2011, when Dawn arrived at Vesta, the second largest world in the main asteroid belt, the spacecraft became the first to orbit a body in the region between Mars and Jupiter, NASA said.

In 2015, when Dawn went into orbit around Ceres, a dwarf planet that is also the largest world in the asteroid belt, the mission became the first to visit a dwarf planet and go into orbit around two destinations beyond Earth, it said.

“The demands we put on Dawn were tremendous, but it met the challenge every time. It’s hard to say goodbye to this amazing spaceship, but it’s time,” said Mission Director and Chief Engineer Marc Rayman at NASA’s Jet Propulsion Laboratory (JPL).

The data Dawn beamed back to Earth from its four science experiments enabled scientists to compare two planet-like worlds that evolved very differently.

Among its accomplishments, Dawn showed how important location was to the way objects in the early solar system formed and evolved, NASA said.

Dawn also reinforced the idea that dwarf planets could have hosted oceans over a significant part of their history — and potentially still do.

“In many ways, Dawn’s legacy is just beginning. Dawn’s data sets will be deeply mined by scientists working on how planets grow and differentiate, and when and where life could have formed in our solar system,” said Principal Investigator Carol Raymond at JPL.

“Ceres and Vesta are important to the study of distant planetary systems, too, as they provide a glimpse of the conditions that may exist around young stars,” Ms. Raymond said.

Because Ceres has conditions of interest to scientists who study chemistry that leads to the development of life, NASA follows strict planetary protection protocols for the disposal of the Dawn spacecraft, NASA said.

Dawn will remain in orbit for at least 20 years, and engineers have more than 99% confidence the orbit will last for at least 50 years, it said.

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