

Rendezvous with a Comet

Mission Overview

In the not too-distant future, teams of scientists are routinely using small maneuverable space stations to venture out into Earth's "neighborhood" as part of a long-term study of small bodies in the Solar System. Primary targets include comets and asteroids, which scientists believe are the oldest, most primitive bodies in the Solar System and may preserve the earliest record of the material that formed Earth and its planetary neighbors.

During this mission, team members work as scientists and engineers headed to **Rendezvous with a Comet** as part of this continued study of our Solar System. These rendezvous missions are critical in helping scientists verify and better understand data collected by earlier small body missions occurring at the start of the new Millennium, such as STARDUST and its capture of cometary material from comet Wild-2 in 2004 and the return of that material to Earth in 2006. The actual samples provided by STARDUST established detailed baseline data on comets still used today.

The onboard astronauts, working with their counterparts in Mission Control, are tasked with sending a probe to intercept and collect new data on a well-studied short period comet before heading on for a continued study of the asteroid Ceres, the largest

known asteroid at 623 miles (1003 km) in diameter.

Comet Encke provides an excellent target because its short period (3.3 years) has allowed it to be observed from Earth at more apparitions (or appearances) than any other comet, including the famous Comet Halley. Encke continues to puzzle scientists because even though it has been in a short-period orbit for thousands of years, the comet continues to have a high level of activity as the Sun's heat boils off its dirty ices into gases and dust. This is the first probe to rendezvous with Encke since 2003 and fly-by of the comet-chasing CONTOUR spacecraft.

The small, maneuverable space stations used for these rendezvous missions require lots of maintenance and care, providing plenty of challenges for the crews in space and on the ground. Navigating into the correct positions for probe launches—not to mention sending a probe the material surrounding an active comet—also requires concentration and teamwork to successfully collect vital scientific information and complete the mission.

Small bodies in the Solar System are highly unpredictable objects and have been known to surprise scientists from time to time, so crew members will also need to be on their toes and ready to make quick decisions.

RENDEZVOUS



WITH A
COMET®