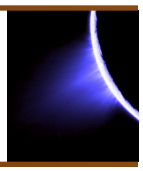
Cassini Solstice Mission Quick-Look Flyby Facts

Enceladus E-12 Encounter (Rev 141)



Quick Facts

Closest Approach at 2010-334T11:53:59
Nov. 30, 2010
Altitude: 47.9 km (29.8 miles)
Speed: 6.3 km/sec (~14,000 mph)
Closest Approach latitude: 61° N

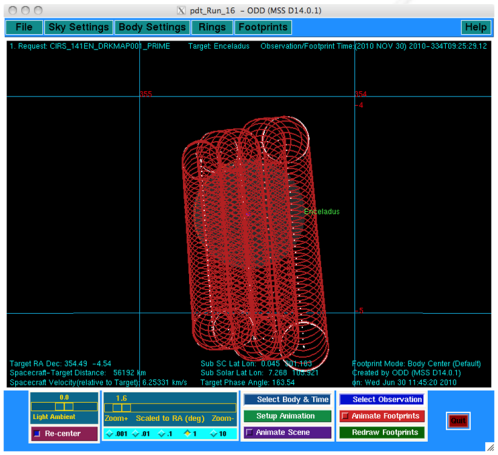
- Closest Approach occurs just two hours after Periapse
- Second targeted Enceladus encounter in the Solstice Mission

Flyby Setup Maneuver Schedule

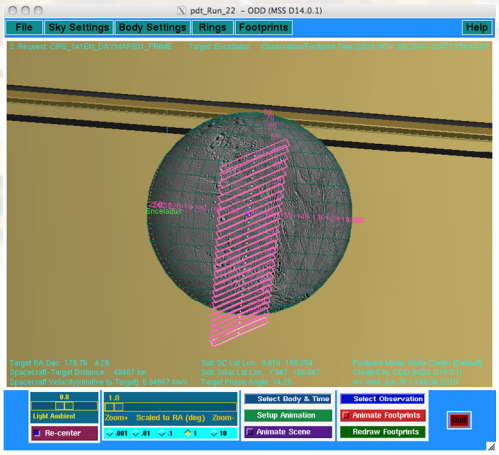
Enceladus approach maneuver on Wednesday, November 27 UTC 331T10:20:00

Science Highlights

The focus of this ~50 kilometer altitude, northern hemisphere flyby is the study of Enceladus's gravity and interior. The Cassini radio science subsystem (RSS) will measure the strength of the Enceladus gravity field as the Cassini spacecraft flies by. Cassini will make these measurements by pointing the High Gain Antenna at Deep Space Network (DSN) stations on Earth during the closest approach period; such measurements will also be made during the "wings" of the flyby, on approach and on departure, before and after other science measurements are made. In combination with other flybys, the team will be able to tease out information about the interior of Enceladus. Does Enceladus host a subsurface ocean? Could this ocean be the source of the dramatic south polar plume? Or is there a diapir at the south pole, a region of warm, low density material that rises up to the surface?



On the inbound leg, the composite infrared spectrometer (CIRS) will do scans of nighttime temperatures at low latitudes.



On the outbound leg, CIRS and other instruments will scan the daytime surface. Enceladus is in front of the disk of Saturn during this period.

For the latest Cassini information visit http://saturn.jpl.nasa.gov

Sequence of Events

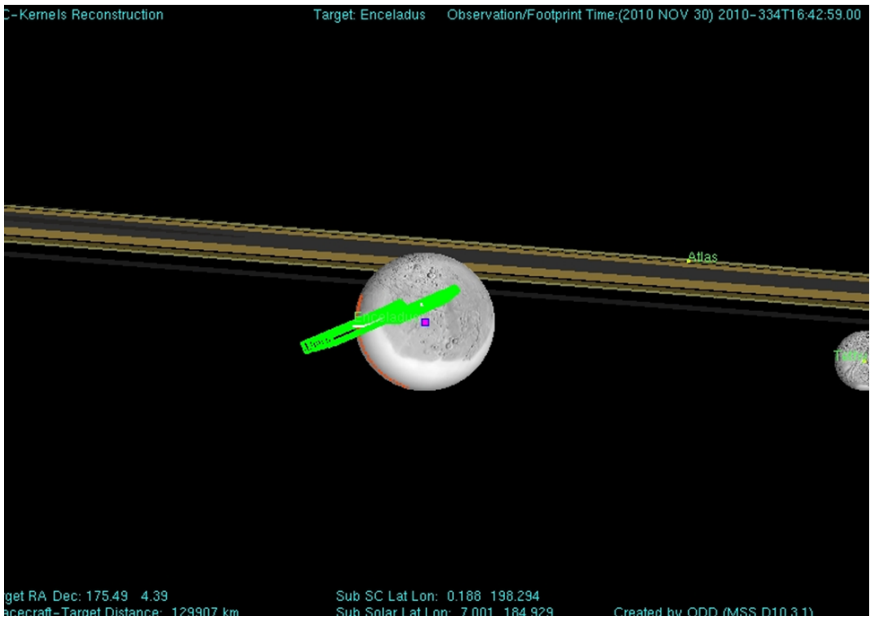
Inbound/Outbound Wings

On the inbound leg of the trajectory, the instruments will make measurements of the Enceladus plume, as the surface will be in darkness while the plume, and jets that make up the plume, are illuminated by the sun. The Composite Infrared Mapping Spectrometer (CIRS) will do scans of nighttime temperatures at low latitudes, to better understand the thermophysical properties of the surface, to confirm heat flow models, and look for any hot spots away from the south pole.

During the closest approach period, the spacecraft will be oriented such that the remote sensing instruments will be able to take snapshot images and spectra of the surface of Enceladus as is whizzes through their bore sights at ~14,000 mph.

On the outbound leg, CIRS will scan the day side to look for hot spots. ISS, VIMS and UVIS will "ride along" to make compositional and geological measurements.

Throughout the flyby, the fields-and-particles instruments will be taking data to understand the magnetospheric, plasma and dust environment of Enceladus. (Though spacecraft pointing during the E-11 flyby is not optimized for these instruments, the "twin" flyby, E-13 on December 21, will focus on fields-and-particles measurements.)



Toward the end of the flyby sequence, VIMS and other instruments will make measurements of Enceladus in front of Saturn's rings.