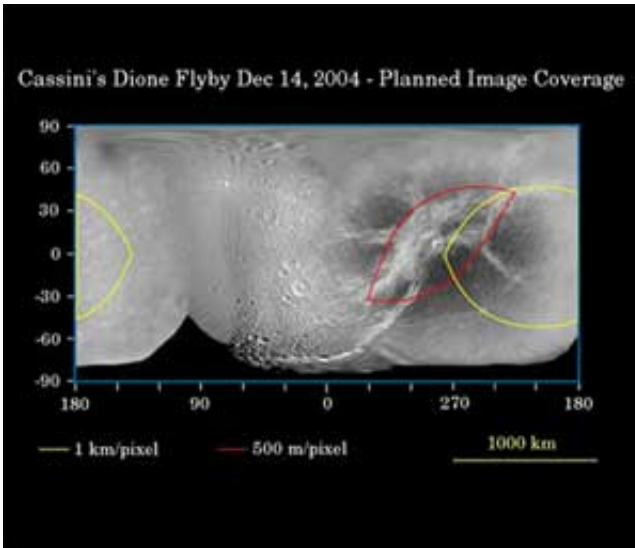


Another Successful Cassini's Titan Flyby

December 15 2004



The Cassini spacecraft completed a successful rendezvous with Saturn's moon Titan on Monday, Dec. 13. This was the last pass before the European Space Agency's Huygens probe is sprung loose from Cassini on Christmas Eve (in U.S. time zones). Information gathered during this flyby will provide an opportunity to compare images from Cassini's first close Titan encounter which occurred on Oct. 26

NASA's Deep Space Network tracking station in Madrid, Spain, acquired a signal at about 4:00 p.m. Pacific Standard Time (7:00 p.m. Eastern Standard Time) yesterday. As anticipated, the spacecraft came within 1,200 kilometers (750 miles) of Titan's surface.

The map of Saturn's moon Dione, generated from Cassini images taken during the spacecraft's first two orbits of Saturn, illustrates the imaging coverage planned during Cassini's first Dione flyby on Dec. 14, 2004. Colored lines enclose regions that will be covered at different imaging scales as Cassini approaches Dione.

Cassini will zoom past Dione at a distance of approximately 81,400 kilometers (50,600 miles) during this flyby. An even closer encounter with Dione is in store for Cassini in October 2005, when the spacecraft is slated to fly past the icy moon at a mere 500 kilometers (311 miles).

Images from this week's flyby will be superior in resolution to those obtained by NASA's Voyager 1 in November 1980. Voyager 1 passed Dione at a distance of 161,520 kilometers (100,364 miles) at closest approach, yielding a best resolution of approximately 1 kilometer per pixel. The area to be imaged at highest resolution by Cassini during this upcoming flyby will be centered on the bright, wispy terrain on Dione's trailing hemisphere, marked by the red outline on this map. The resolution of Cassini images in this region will be 500 meters per pixel and better.

The map was created by images acquired in visible light using the Cassini narrow angle camera. The highest southern latitudes on Dione have not yet been seen by Cassini, resulting in the map's lower limit of approximately 80 degrees south latitude.

As with the last flyby, a major goal of this flyby was to measure the thickness of Titan's atmosphere. The information gathered will help determine whether Cassini can safely get closer to Titan on subsequent flybys, and will also be used to verify that Huygens atmosphere models are correct.

Launched Oct. 15, 1997, on a journey covering 3.5 billion kilometers

(2.2 billion miles), Cassini is the most highly instrumented and scientifically capable planetary spacecraft ever flown. It has 12 instruments on the Cassini orbiter and six more on the Huygens probe. The study of Titan, Saturn's largest moon, is one of the major goals of the mission. Titan may preserve, in deep-freeze, many of the chemical compounds that preceded life on Earth. Cassini will execute 45 flybys of Titan, coming as close as approximately 950 kilometers (590 miles) above the surface. This will permit high-resolution mapping of the moon's surface with an imaging radar instrument, which can see through the opaque haze of Titan's upper atmosphere.

Titan is a prime target of the Cassini-Huygens mission because it is the only moon in our solar system with a thick smoggy atmosphere. The Huygens probe, built and operated by the European Space Agency, is attached to Cassini. After its Christmas Eve release, it will descend through Titan's atmosphere on Jan. 14, 2005, as it collects atmospheric data down to the surface. Huygens will be the first probe to descend to the surface of a moon of another planet.

Citation: Another Successful Cassini's Titan Flyby (2004, December 15) retrieved 10 April 2024 from <https://phys.org/news/2004-12-successful-cassini-titan-flyby.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--