Cassini Update − February 18, 2005

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Cassini Significant Events
for 02/10/05 − 02/16/05

The most recent spacecraft telemetry was acquired today from the Goldstone
tracking station. The Cassini spacecraft is in an excellent state of health
and is operating normally. Information on the present position and speed of
the Cassini spacecraft may be found on the "Present Position" web page
located at http://saturn.jpl.nasa.gov/operations/present−position.cfm .

Activities this week:

The fourth week of S08 began with the ongoing Visible and Infrared Mapping
Spectrometer (VIMS) observations of the Saturn atmosphere, focusing on the
detection of methane fluorescence. The Imaging Science Subsystem (ISS)
observed Titan and looked for shepherding satellites of the C−Ring. On
Friday the first of the special events for this week occurred. Orbital Trim
Maneuver 13 successfully executed and was followed by a Titan targeted
encounter. This very busy week wrapped up with some CIRS F−Ring observations
and ISS observations of Enceladus as Cassini approaches for next week's
non−targeted flyby.

Thursday, February 10:

The Project succeeded in providing another astronomy picture of the day.
The image of Blue Saturn (with Mimas) can be found on the Cassini Web site.
The rings are, as usual, gorgeous, but the detail that can be seen in Mimas
is outstanding.

The Radio Science Subsystem (RSS) team performed another operational readiness test (ORT) today. The tests are being performed to prepare the instrument and the DSN for an occultation during Titan−3 and for the Enceladus mass determination observations.

The S08 sequence leads uplinked a number of files to the spacecraft today. Among them were an ACS S08 telemetry schedule overlay for February 15, a RADAR instrument expanded block trigger for the Titan flyby, a Magnetospheric Imaging Instrument (MIMI) power cycle command for the Low Energy Magnetospheric Measurement Subsystem, and commands for the Cosmic Dust Analyzer (CDA) involving data rate handling, uplink of the real time activity for the ring plane crossing on February 16, and threshold level adjustments for the Enceladus flyby.

Mission Assurance convened a risk team meeting to re−assess risks identified for orbital tour operations. The outcome of this risk team meeting was not only to re−assess existing risks, but also each risk item was re−assessed for placement into a 5X5 risk matrix. This is significant in that Cassini has used a 3X4 risk matrix since the inception of the risk management program for mission operations. The team met and reassessed a portion of the remaining open risk items. A follow−up meeting has been scheduled to complete the risk assessment activity.

Friday, February 11:

Orbit trim maneuver #13 (OTM−13) was successfully completed on the spacecraft tonight. This maneuver, also called the "T3 minus 3 day maneuver," refines Cassini's trajectory for the 1,577 km flyby of Titan on February 14.

The reaction control system maneuver began at 11:15 p.m. Pacific Time. A "quick look" immediately after the maneuver showed the burn duration was 220.5 seconds, giving a delta−V of approximately 207.2 mm/s. ACS reported the burn termination was a "nominal complete" with a "virtual

accelerometer"
cutoff. All spacecraft subsystems are nominal.

Preliminary port 2 of the Science Operations Plan Update process for tour
sequence S11 was achieved today. The products were merged and output reports published.

Monday, February 14:

Early today RSS performed their final ORT in preparation for the Titan flyby.

Titan 3 (T3), Cassini's third close flyby of Saturn's largest moon, occurred
today. During the flyby, the Composite and Infrared Spectrometer (CIRS)
made two full−hemisphere temperature maps, inbound and outbound, to measure
dynamics and atmospheric circulation. CIRS also conducted composition integrations in the far Infrared of the south tropical nadir, and
mid−Infrared at the north polar limb, which should produce a great chance to
detect new species. In particular, the mid−Infrared integration over the
north pole gave CIRS a glimpse of stratospheric chemistry over the winter
pole. This CIRS data will fold into the Huygens Titan atmospheric model
effort.

The Imaging Science Subsystem (ISS) took movies to look for cloud motion and
make wind measurements.

The Ultraviolet Imaging Spectrograph performed a series of Extreme Ultraviolet and Far Ultraviolet scans across Titan to create spectral images.

The Radio and Plasma Wave Science (RPWS) instrument measured the density and
temperature of the thermal electrons near Titan and in its ionosphere, searched for evidence of atmospheric lightning, looked for evidence of the
ion pickup process, and studied the interaction of Titan with Saturn's magnetosphere.

The Cassini Plasma Spectrometer measured the plasma environment of Titan and
searched for pickup ions resulting from atmospheric loss.

The Dual Technique Magnetometer also studied the magnetic environment of
Titan, its interactions and plasma environment.

During closest approach the RADAR instrument performed Synthetic Aperture
Radar imaging, including the first real bright terrain, which includes part
of Xanadu, to be the subject of a joint Optical Remote Sensing/RADAR
investigation. RADAR altimetry measurements taken during the flyby will
establish whether the lack of topography identified during an earlier Titan
flyby was atypical.

Processing of the downlinks for T3 was accelerated by running off the
real−time Telemetry Delivery Subsystem data stream. DSMS−provided image
display capabilities were used within the Project for real−time presentation
of the ISS data. In English, this means we got to watch the images as they
came down from the spacecraft.

Tuesday, February 15:

A beautiful picture of Rhea taken by Cassini is today's Astronomy Picture of
the Day.

"The stars come out for Founders' Day" was the theme for the Santa Fe Middle
School annual PTA Founders' Day celebration held tonight. Despite a 60%
chance of rain, Saturn Observation Campaign and Cassini Outreach brought
three easy−to−pack−up−in−the−rain telescopes to the school's annual PTA
Founders' Day celebration. The first quarter moon, Pleiades star cluster,
and of course Saturn, emerged from the clouds as if by magic. Over 300
parents, teachers and students attended. A bonus for the event was a
closing talk given by a Cassini ITL member who graduated from the school.
While a student at Santa Fe, she had listened to a visiting JPL engineer
give a talk about the Viking mission, and this inspired her to pursue
education leading to a career at JPL.

Today Science Planning dusted off the S13 sequence that had been archived in
January of 2003 and began the Aftermarket process. An assessment meeting was

held to review all of the requested changes to the sequence. It appears that
all of the requested changes can fit within the available resources.

A final waiver and sequence change request meeting was held as part of development for S09.

Wednesday, February 16:

Today Cassini again passed through Saturn's ring plane. The CDA team members are tremendously excited about the science they will gain with this
opportunity.

The wrap−up meeting for the Science Operations Plan (SOP) Implementation for
S41 was held today. This sequence is now in the process of being archived.
This completes the development of the SOP for the entire prime mission out
to 2008. This task required 2 years and 9 months of intense effort to complete and resulted in 41 tour sequences being developed down to the command level.

The S09 Final Sequence Integration and Validation products were released
today for review by participating teams.

ISS personnel at JPL conducted two tests in the Integrated Test Lab (ITL)
using the ISS Engineering Models. The first test exercised the 1.4 flight
software checkout sequence. The second test simulated instrument error conditions and exercised failure recovery. Analysis of the results is underway.

VIMS personnel have resolved a long−standing flight software issue that resulted in lost science data unless a workaround was performed. The issue
involved the compounding of the effects of two different software errors
dating back to the original code. The resolution led to the prediction of
potential lost data at T3. A precisely timed VIMS configuration command was
sent to eliminate the risk. This command will need to be sent after every
other sleep/wake cycle through the S09 sequence. S10 and subsequent sequences will be protected by a ground software change.

JPL put out a news release today regarding a giant crater the size of Iowa
on Titan that was spotted by the RADAR instrument during Tuesday's Titan
flyby. News Release: 2005−029

Wrap up:

That's it for this week.

Friday and Saturday nights, February 18 and 19, weather permitting, the
Saturn Observation Campaign will have a couple telescopes out in old town
Pasadena and Monrovia for Saturn and moon viewing. It's definitely Saturn
time right now. The jewel of the Solar System is overhead, offering the best
views of the season. You can use the star chart on the Saturn Observation
Campaign website to see where to look − Saturn is near the Gemini Twins,
Castor and Pollux right now. It's on the "Viewing Saturn" page, all freshly
updated for 2005. Scroll down to see the star chart.
http://soc.jpl.nasa.gov/viewing.cfm

The Cassini−Huygens mission is a cooperative project of NASA, the European
Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory, a
division of the California Institute of Technology in Pasadena, manages the
Cassini−Huygens mission for NASA's Science Mission Directorate, Washington,
D.C. JPL designed, developed and assembled the Cassini orbiter.