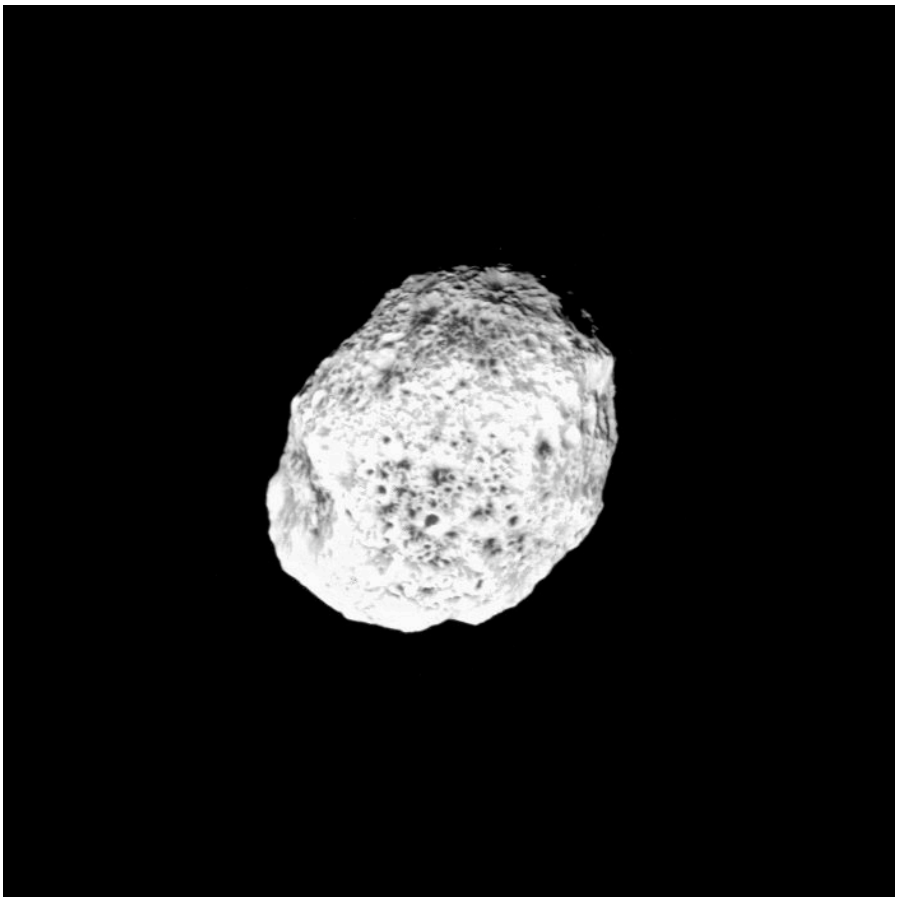
C A S S I N I



H Y P E R I O N - 1
A N D T E T H Y S
MISSION DESCRIPTION

September 2005

Jet Propulsion Laboratory
California Institute of Technology

1.0 OVERVIEW

Late September of 2005 contains an unprecedented double icy satellite encounter spanning a mere two days. Hyperion, a unique irregular body with curious features already glimpsed from afar (see cover), was discovered in 1848 and named after a great Titan of myth who fathered Helios and Selene, the Sun and Moon deities. The sole targeted flyby of this body occurs on Monday, September 26. Two days earlier, a targeted-class flyby of Tethys occurs, on Friday September 24. Tethys was discovered by Jean-Domnique Cassini (after whom our orbiter is named) in 1684 and was named after the youngest of the Titanesses, who bore the mythical Okeanides sea-nymphs. This flyby is technically non-targeted (meaning there are no maneuvers solely designed to control the flyby trajectory); however, through heroics recently undertaken by the Cassini navigation team, this encounter was able to be lowered to allow for spectacularly close study.

The closest approach to Tethys occurs on Saturday, September 24, at 02:42 SCET (9:02 PM on September 23 Pacific Time) at an altitude of 1500 km (930 miles) above the surface and at a speed of 9 kilometers per second (20,000 mph). The closest approach to Hyperion occurs on Monday, September 26, at 02:25 SCET (8:45 PM on September 25 Pacific time) at an altitude of 514 km (319 miles) above the surface and at a speed of 5.6 kilometers per second (12,500 mph).

Hyperion, roughly 1/3 the size of its round neighbor Tethys, is one of the smaller moons of Saturn and is shaped like a potato with the diameter of the long axis being 360 km (223 miles) and diameter of the short axis are around 250 km (150 miles). Tethys has a radius of approximately 1050 km (650 miles).

Given the proximity of these two encounters and the outstanding low altitudes, the fact that these will be the only close flybys of these bodies, and the general difficulty of finding close encounters with icy satellites having radically different periods and orbits, this double encounter is a nearly unbelievable stroke of good fortune.

These encounters are set up with two maneuvers: an apoapsis maneuver scheduled for September 19th, and an approach maneuver, scheduled for September 23rd. These flybys are outbound from Saturn, with periapsis occurring September 23rd.

Tethys and Hyperion will be the fifth and sixth close encounters with icy satellites, after Phoebe, Enceladus (orbit 3, non-targeted), Enceladus (orbit 4), and Enceladus again (orbit 11). (It could be argued that the study of Iapetus on orbit C was intense enough even at 120,000 km to merit inclusion in this list, making these encounters the sixth and seventh.)

Though the Tethys encounter comes first in time, the following sections begin with Hyperion, because that is the targeted encounter and has the highest concentration of activities.

1.1 ABOUT HYPERION

Hyperion is a unique moon in that its rotation is chaotic; the axis about which the moon spins changes. Hyperion was first discovered by Earth-based observers in 1848. Hyperion is one of the smaller moons of Saturn, and is not spherical but has mean radii (tri-axial ellipsoid) of 164, 130 and 107 km. Hyperion is also unique because of its color, which is redder than the other icy moons of Saturn. Hyperion's surface is composed of water ice, in addition to other non-water ice species including organics. Hyperion has a much lower albedo than most of the other icy satellites,reflecting just ~30% of the incident light, and along with the lower albedo come higher temperatures. The surface temperature at Hyperion is ~115K compared with temperatures of less than ~90K on the other icy moons.

At a distance of 1,481,000 km, Hyperion orbits Saturn once in 21.28 days and is sometimes outside the magnetosphere of Saturn, depending of solar pressure of the magnetosphere. Hyperion appears to be a very battered body. Its appearance along with its chaotic rotation and relatively highly eccentric orbit suggest that Hyperion has relatively recently survived a major impact by another body. Hyperion has been proposed to be a source of the dark material on the leading hemisphere of Iapetus.

1.2 ABOUT TETHYS

Tethys is one of the medium-sized moons of Saturn, and has the most diversity: cratered plains of different ages, indicating various resurfacing episodes; a single large crater "Odysseus"; a massive chasm; evidence for localized resurfacing; and a variety of brightness variations.Tethys is nearly spherical with radii of (tri-axial ellipsoid) of 536, 528, and 526 km. Tethys' rotation is tidally locked to Saturn, and the body is unique because of its large chasm, called Ithaca Chasma, which dominates one whole side of the moon. Tethys' surface is composed primarily of water ice and has a typical albedo for the icy moons, reflecting 80% of the light falling upon it. The surface temperature at Tethys is about ~90K, as with most of the other icy moons. At a distance of 295,000 km, Hyperion orbits Saturn once in 1.89 days and has a measurable inclination to Saturn's equator of 1.1 degrees.

1.3 HYPERION SCIENCE ACTIVITIES

The September 26, 2005 flyby represents the single close encounter with Hyperion during the Cassini mission. The Cassini project is interested in four broad science themes concerning Hyperion: its interior stucture, surface characteristics and composition, investigation of volatiles and tenuous atmosphere if present, and interaction with Saturn's magnetosphere. In particular, this flyby will probe the following questions: Is Hyperion a "rubble pile"? What is the relationship between Phoebe, Iapetus and Hyperion?

CAPS will make measurements of the ion environment around Hyperion during the flyby. The spacecraft will likely encounter Hyperion downstream of the corotational flow, but this is not necessarily the case and will depend on the solar activity and the amount of solar pressure on Saturn's magnetosphere.

CIRS will make measurements to constrain the bolometric albedo, thermal inertial and volatile stability of Hyperion. The chaotic rotation of Hyperion suggests that the surface temperatures will be unlike those of bodies with normal rotations. CIRS will obtain spectra in the 10-500 um wavelength region to search for compositionally diagnostic spectral features.

ISS imaging of Hyperion (with resolution up to – m/pix) will constrain the shape of Hyperion.

RPWS will look for evidence of a plasma source at Hyperion, and examine the plasma wave spectrum for evidence of magnetosphere-moon interactions. RPWS will also look for signatures of dust impacts.

RSS measurements on the inbound and outbound legs of the flyby will determine the mass of Hyperion.

UVIS will investigate the surface composition of Hyperion and study the water ice grain sizes. Ultraviolet spectra will be studied to look for evidence of volatile activity contributing to a tenuous atmosphere.

VIMS will obtain infrared-visible spectra that can be used to study the surface composition of Hyperion. VIMS data will be used to perform grain size mapping across the surface and make compositional maps of Hyperion.

1.4 TETHYS SCIENCE ACTIVITIES

Key questions about Tethys that this encounter's activities hope to unlock include: What is Ithaca Chasma? How is it related to the large crater Odysseus? What are their relation to the history and formation of the body? What are the resurfacing dynamics of the satellite? What are the trace elements on the surface and how are they distributed? How does the E ring interact with Tethys, which lies deep inside it? Could Tethys be a partial source of the E ring?

This encounter should offer spectacular views of Ithaca Chasma. The closest approach phase has been likened to Luke's hair-raising flight through the trench of the Death Star, though our orbiter will be much farther away (and at no risk of being shot at).

CIRS will make measurements to constrain the bolometric albedo, thermal inertial and volatile stability of Tethys, and obtain spectra in the 10-500 um wavelength region to search for compositionally diagnostic spectral features.

ISS will take 3x3 mosaics of Tethys and perform detailed mapping of Ithaca Chasma at a variety of resolutions up to 18 meters per pixel.

CAPS will sample for corotating plasma flow and acquire good ion composition data.

UVIS aims to study surface composition and grain size via reflection spectra of Tethys' predominantly water ice surface, age and evolution from UV albedo maps and phase function, and tenuous atmospheres via stellar occultations. UVIS observations at Tethys will include a good stellar occultation as a sensitive probe for the presence of an atmosphere and Tethys' interaction with the E ring.

RPWS will look for evidence of a plasma source at Tethys, examine the plasma wave spectrum for evidence of magnetosphere-moon interactions, and search for signatures of dust impacts.

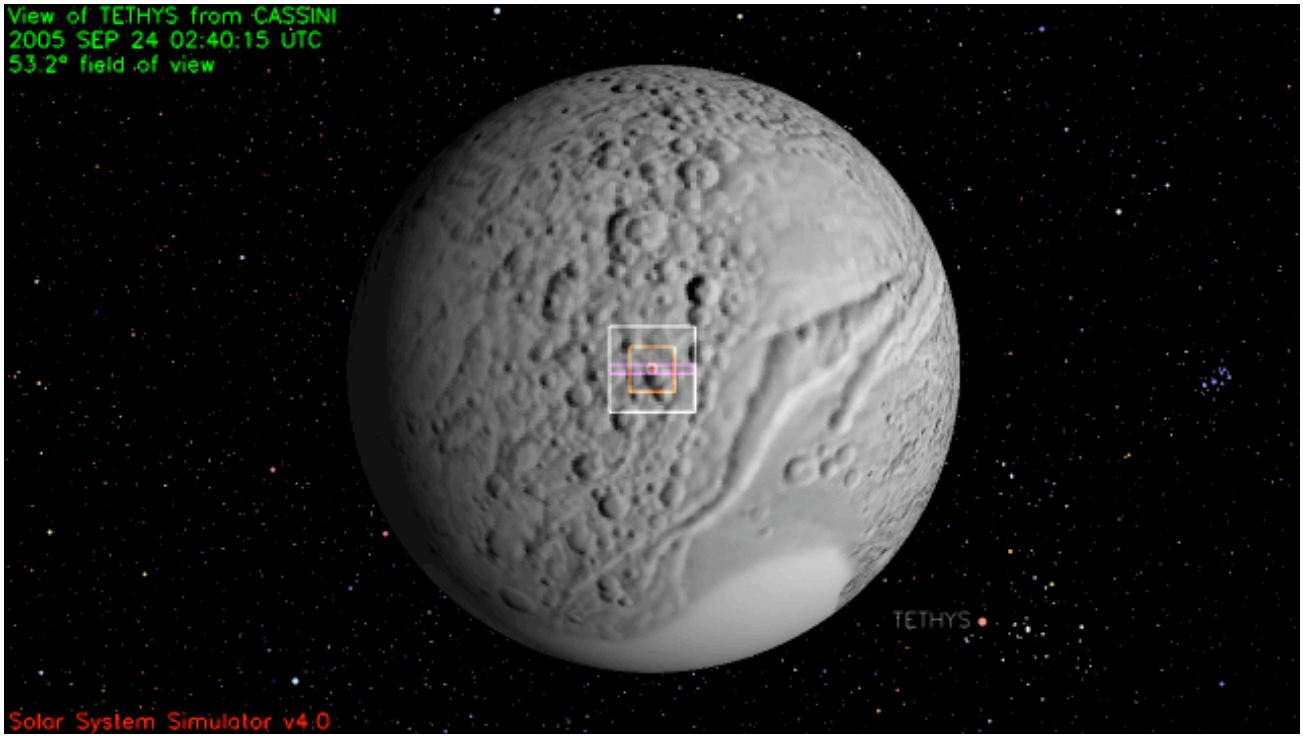
RADAR will study the radio albedo of Tethys and associate its measurements with other icy bodies of the solar system.

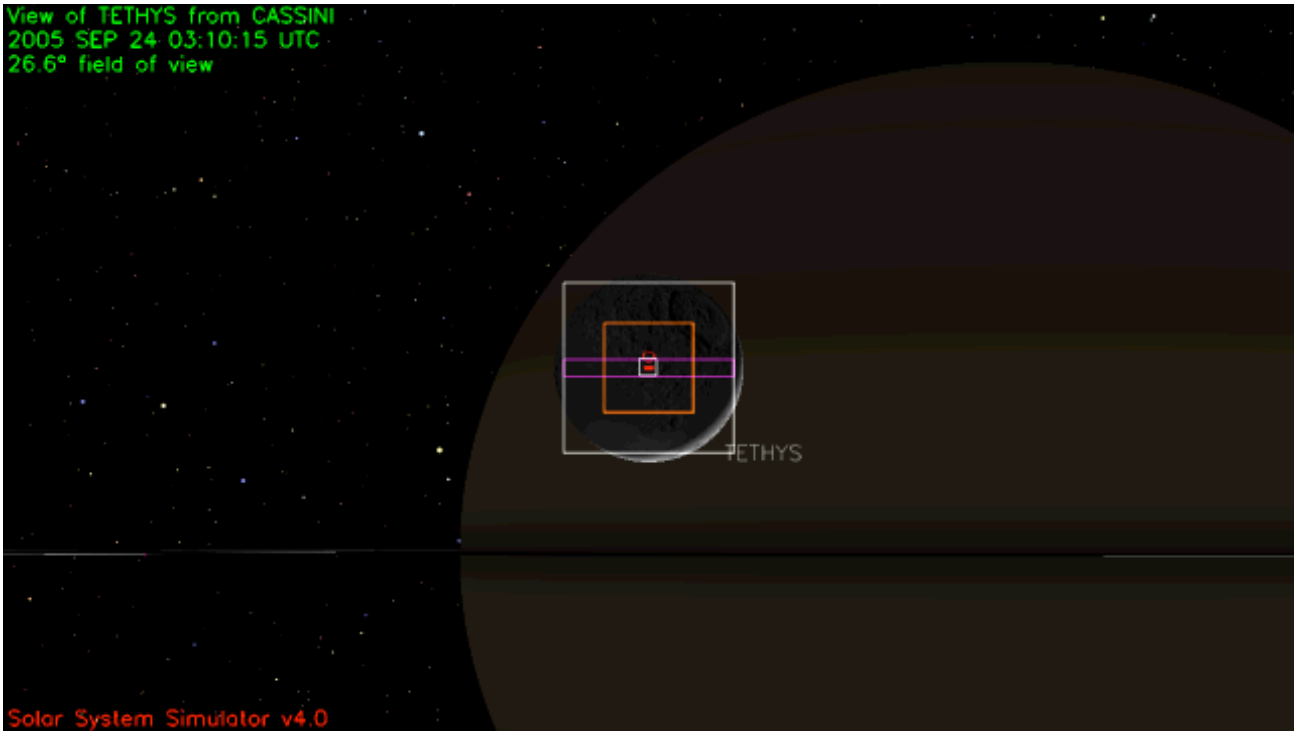
1.5 HYPERION AND TETHYS DATA RECORDING AND PLAYBACK

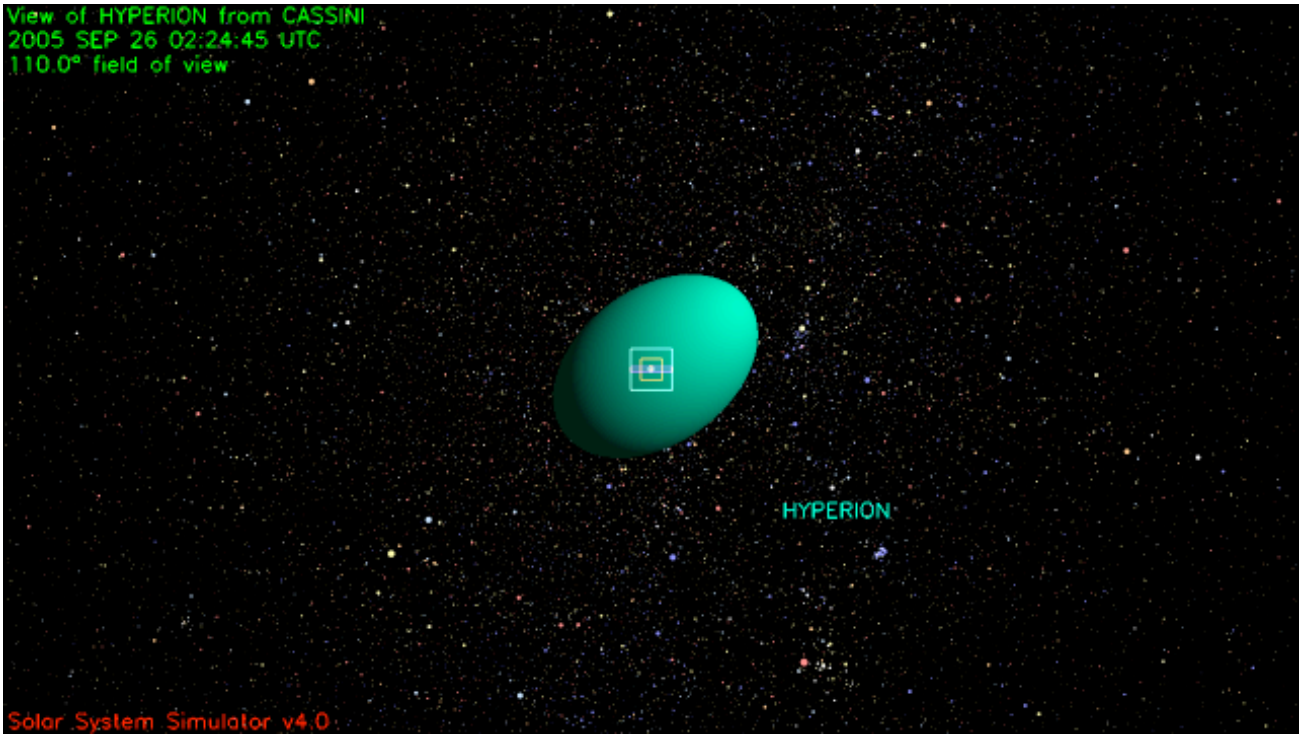
A time ordered description of the Hyperion data playback is shown on the following pages. The Solid State recorders are essentially filled across the whole time period with several 70-meter station supports to empty the recorders frequently.

One-way light time at the time of the encounters is 1 hour and 20 minutes.

1.6 SAMPLE SNAPSHOTS



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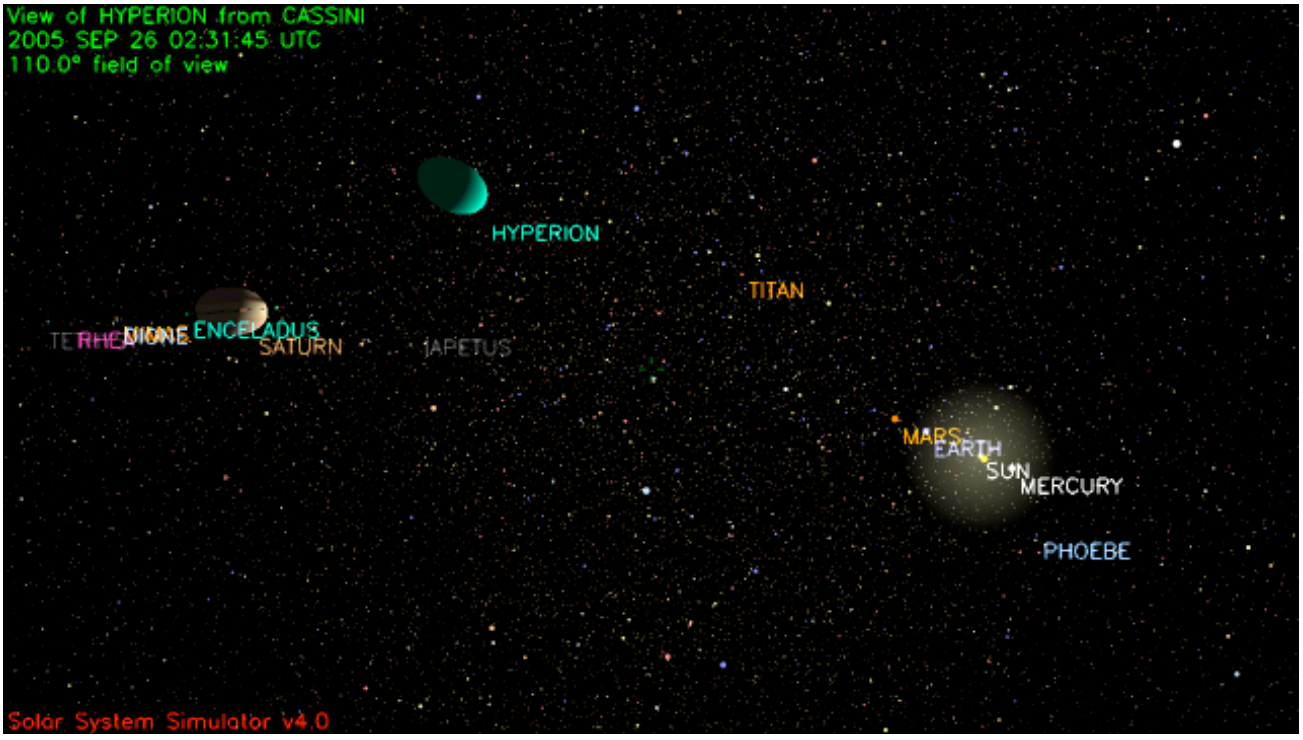
110.0° field of view
HYPERION
Solar System Simulator v4.0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PHOEBE
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015HY (H1) Playback Timeline **Created Sept. 16, 2005**

Event or Observation	Observation Type (APGEN)	Observation Record Start Time (yyyy-dddThh:mm:ss) (SCET)	Start Time - Reference Epoch (ddThh:mm)	Start Playback (Ground UTC)		Start Playback (Pacific Time)	
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015HY (H1) Playback Timeline **Created Sept. 16, 2005**

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INMS_015HY_ICYSATCL001_ISS	INMS_1498	2005-269T02:09:46	-00T00:15	27-Sep Tue 01:38 PM	Tue 04:17 PM	27-Sep Tue 06:38 AM	Tue 09:17 AM
CIRS_015HY_FP1DSKOUT001_PRIME	CIRS_4000	2005-269T02:18:46	-00T00:06	27-Sep Tue 01:52 PM	Tue 04:33 PM	27-Sep Tue 06:52 AM	Tue 09:33 AM
ISS_015HY_FP1DSKOUT001_CIRS	ISS_Phot_1_by_1	2005-269T02:18:46	-00T00:06	27-Sep Tue 01:52 PM	Tue 04:33 PM	27-Sep Tue 06:52 AM	Tue 09:33 AM
UVIS_015HY_ICYMAP012_CIRS	UVIS_32096	2005-269T02:18:46	-00T00:06	27-Sep Tue 01:52 PM	Tue 04:33 PM	27-Sep Tue 06:52 AM	Tue 09:33 AM
VIMS_015HY_HYPERIONC014_CIRS	VIMS_18432	2005-269T02:18:46	-00T00:06	27-Sep Tue 01:52 PM	Tue 04:33 PM	27-Sep Tue 06:52 AM	Tue 09:33 AM
RSS_015HY_THERMAL002_RSS	RSS_Activity	2005-269T02:34:46	00T00:09	27-Sep Tue 02:10 PM	Tue 04:53 PM	27-Sep Tue 07:10 AM	Tue 09:53 AM
INMS_015HY_ICYSATOB001_ISS	INMS_1498	2005-269T02:39:46	00T00:14	27-Sep Tue 03:31 PM	Tue 05:00 PM	27-Sep Tue 08:31 AM	Tue 10:00 AM
CAPS_015SA_SURVEY002_RIDER	CAPS_16000	2005-269T02:54:46	00T00:29	27-Sep Tue 03:48 PM	Tue 05:19 PM	27-Sep Tue 08:48 AM	Tue 10:19 AM
MIMI_015CO_SURVEY003_RIDER	MIMI_8000	2005-269T02:54:46	00T00:29	27-Sep Tue 03:48 PM	Tue 05:19 PM	27-Sep Tue 08:48 AM	Tue 10:19 AM
RPWS_015SA_OUTSURVEY003_PRIME	RPWS_30464	2005-269T02:54:46	00T00:29	27-Sep Tue 03:48 PM	Tue 05:19 PM	27-Sep Tue 08:48 AM	Tue 10:19 AM

015HY (H1) Playback Timeline **Created Sept. 16, 2005**

Event or Observation	Observation Type (APGEN)	Observation Record Start Time (yyyy-dddThh:mm:ss) (SCET)	Start Time - Reference Epoch (ddThh:mm)	Start Playback (Ground UTC)		Start Playback (Pacific Time)	
				Best Estimate	Latest Possible	Best Estimate	Latest Possible
CIRS_015HY_HYPERIONU002_UVIS	CIRS_4000	2005-269T03:18:46	00T00:53	27-Sep Tue 03:53 PM	Tue 05:26 PM	27-Sep Tue 08:53 AM	Tue 10:26 AM
ISS_015HY_ICYMAP013_UVIS	**ISS_Phot_1_by_1**	**2005-269T03:18:46**	**00T00:53**	**27-Sep Tue 03:53 PM**	**Tue 05:26 PM**	**27-Sep Tue 08:53 AM**	**Tue 10:26 AM**
UVIS_015HY_ICYMAP013_PRIME	UVIS_32096	2005-269T03:18:46	00T00:53	27-Sep Tue 03:53 PM	Tue 05:26 PM	27-Sep Tue 08:53 AM	Tue 10:26 AM
VIMS_015HY_HYPERIONC015_UVIS	**VIMS_18432**	**2005-269T03:18:46**	**00T00:53**	**27-Sep Tue 03:53 PM**	**Tue 05:26 PM**	**27-Sep Tue 08:53 AM**	**Tue 10:26 AM**
CDA_015HY_DUST002_RIDER	CDA_524	2005-269T03:26:00	00T01:01	27-Sep Tue 03:57 PM	Tue 05:31 PM	27-Sep Tue 08:57 AM	Tue 10:31 AM
INMS_015SA_SURVEY004_RIDER	**INMS_1498**	**2005-269T03:39:46**	**00T01:14**	**27-Sep Tue 04:05 PM**	**Tue 05:39 PM**	**27-Sep Tue 09:05 AM**	**Tue 10:39 AM**
RSS_015HY_MASS002_PRIME	RSS_Activity	2005-269T04:10:16	00T01:45	27-Sep Tue 04:20 PM	Tue 05:58 PM	27-Sep Tue 09:20 AM	Tue 10:58 AM
MAG_015OT_SURVEY011_PRIME	MAG_1976	2005-269T04:24:46	00T01:59	27-Sep Tue 04:21 PM	Tue 05:59 PM	27-Sep Tue 09:21 AM	Tue 10:59 AM
CDA_015DR_GAP001_RIDER	CDA_524	2005-269T05:15:01	00T02:50	27-Sep Tue 04:23 PM	Tue 06:01 PM	27-Sep Tue 09:23 AM	Tue 11:01 AM
RADAR_015HY_SCATTRAD001_PRIME	**RADAR_364800**	**2005-269T05:55:16**	**00T03:30**	**27-Sep Tue 04:24 PM**	**Tue 06:02 PM**	**27-Sep Tue 09:24 AM**	**Tue 11:02 AM**
RSS_015HY_KADOWN002_RSS	RSS_Activity	2005-269T08:35:00	00T06:10	27-Sep Tue 05:19 PM	Tue 06:58 PM	27-Sep Tue 10:19 AM	Tue 11:58 AM
CIRS_015HY_HYPERIONV005_VIMS	CIRS_4000	2005-269T08:57:02	00T06:32	27-Sep Tue 05:27 PM	Tue 07:05 PM	27-Sep Tue 10:27 AM	Tue 12:05 PM
ISS_015HY_HYPERION005_VIMS	**ISS_Phot_1_by_1**	**2005-269T08:57:02**	**00T06:32**	**27-Sep Tue 05:27 PM**	**Tue 07:05 PM**	**27-Sep Tue 10:27 AM**	**Tue 12:05 PM**
UVIS_015HY_ICYMAP014_VIMS	UVIS_32096	2005-269T08:57:02	00T06:32	27-Sep Tue 05:27 PM	Tue 07:05 PM	27-Sep Tue 10:27 AM	Tue 12:05 PM
VIMS_015HY_HYPERION005_PRIME	**VIMS_18432**	**2005-269T08:57:02**	**00T06:32**	**27-Sep Tue 05:27 PM**	**Tue 07:05 PM**	**27-Sep Tue 10:27 AM**	**Tue 12:05 PM**

015TE Playback Timeline **Created Sept. 16, 2005**

Event or Observation	Observation Type (APGEN)	Observation Record Start Time (yyyy-dddThh:mm:ss) (SCET)	Start Time - Reference Epoch (ddThh:mm)	Start Playback (Ground UTC)		Start Playback (Pacific Time)	
				Best Estimate	Latest Possible	Best Estimate	Latest Possible
INMS_015SA_PTOTM34001_RIDER	INMS_1498	2005-266T10:45:00	-00T15:57	24-Sep Sat 11:45 AM	Sat 11:45 AM	24-Sep Sat 04:45 AM	Sat 04:45 AM
RADAR_015OT_WARM4GMAP001_RIDE	RADAR_364800	2005-266T10:45:00	-00T15:57	24-Sep Sat 11:45 AM	Sat 11:45 AM	24-Sep Sat 04:45 AM	Sat 04:45 AM
RADAR_015SA_GLOBALMAP001_PRIM	RADAR_364800	2005-266T11:15:00	-00T15:27	24-Sep Sat 12:06 PM	Sat 12:08 PM	24-Sep Sat 05:06 AM	Sat 05:08 AM
CDA_015RE_0700ERNGX007_PRIME	CDA_524	2005-266T11:47:11	-00T14:55	24-Sep Sat 12:27 PM	Sat 12:31 PM	24-Sep Sat 05:27 AM	Sat 05:31 AM
CDA_015DR_0600DUST074_RIDER	CDA_524	2005-266T12:18:10	-00T14:24	24-Sep Sat 12:51 PM	Sat 12:58 PM	24-Sep Sat 05:51 AM	Sat 05:58 AM
CDA_015DI_0600DIORX008_PRIME	CDA_524	2005-266T12:49:48	-00T13:52	24-Sep Sat 01:11 PM	Sat 01:21 PM	24-Sep Sat 06:11 AM	Sat 06:21 AM
CDA_015DR_0600DUST075_RIDER	CDA_524	2005-266T13:20:47	-00T13:21	24-Sep Sat 01:36 PM	Sat 01:48 PM	24-Sep Sat 06:36 AM	Sat 06:48 AM
RPWS_015SA_SEDDF001_PRIME	RPWS_30464	2005-266T13:37:38	-00T13:04	24-Sep Sat 01:47 PM	Sat 02:00 PM	24-Sep Sat 06:47 AM	Sat 07:00 AM
CDA_015RE_0500ERNGX007_PRIME	CDA_524	2005-266T14:14:45	-00T12:27	24-Sep Sat 02:14 PM	Sat 02:30 PM	24-Sep Sat 07:14 AM	Sat 07:30 AM
1WAY_TO_2WAY_G34BWGNON267	P/B_PAUSE	5 min. Prevents Gap	n/a	24-Sep Sat 02:30 PM	Sat 02:30 PM	24-Sep Sat 07:30 AM	Sat 07:30 PM
CDA_015DR_0500DUST076_RIDER	CDA_524	2005-266T14:45:45	-00T11:56	24-Sep Sat 02:42 PM	Sat 03:01 PM	24-Sep Sat 07:42 AM	Sat 08:01 AM
CIRS_015CP_CALYPSO001_VIMS	CIRS_4000	2005-266T15:30:00	-00T11:12	24-Sep Sat 03:14 PM	Sat 03:37 PM	24-Sep Sat 08:14 AM	Sat 08:37 AM
ISS_015CP_CALYPSO001_VIMS	ISS_Phot_1_by_1	2005-266T15:30:00	-00T11:12	24-Sep Sat 03:14 PM	Sat 03:37 PM	24-Sep Sat 08:14 AM	Sat 08:37 AM
UVIS_015CP_ICYLON001_VIMS	UVIS_5032	2005-266T15:30:00	-00T11:12	24-Sep Sat 03:14 PM	Sat 03:37 PM	24-Sep Sat 08:14 AM	Sat 08:37 AM
VIMS_015CP_CALYPSO001_PRIME	VIMS_18432	2005-266T15:30:00	-00T11:12	24-Sep Sat 03:14 PM	Sat 03:37 PM	24-Sep Sat 08:14 AM	Sat 08:37 AM
CDA_015TE_0500TEORX007_PRIME	CDA_524	2005-266T15:30:14	-00T11:12	24-Sep Sat 03:14 PM	Sat 03:37 PM	24-Sep Sat 08:14 AM	Sat 08:37 AM
CDA_015DR_0500DUST077_RIDER	CDA_524	2005-266T15:45:39	-00T10:56	24-Sep Sat 03:39 PM	Sat 04:09 PM	24-Sep Sat 08:39 AM	Sat 09:09 AM
CDA_015RE_0400ERNGX007_PRIME	CDA_524	2005-266T16:10:35	-00T10:31	24-Sep Sat 04:14 PM	Sat 04:57 PM	24-Sep Sat 09:14 AM	Sat 09:57 AM
CDA_015DR_0400DUST078_RIDER	CDA_524	2005-266T16:36:03	-00T10:06	24-Sep Sat 04:55 PM	Sat 05:50 PM	24-Sep Sat 09:55 AM	Sat 10:50 AM
CDA_015EN_0400ENORX014_PRIME	CDA_524	2005-266T17:19:39	-00T09:22	24-Sep Sat 05:53 PM	Sat 07:08 PM	24-Sep Sat 10:53 AM	Sat 12:08 PM
MAG_015OT_INTFLD001_PRIME	MAG_1976	2005-266T17:30:00	-00T09:12	24-Sep Sat 06:01 PM	Sat 07:17 PM	24-Sep Sat 11:01 AM	Sat 12:17 PM
CDA_015DR_0400DUST079_RIDER	CDA_524	2005-266T17:40:49	-00T09:01	24-Sep Sat 06:10 PM	Sat 07:27 PM	24-Sep Sat 11:10 AM	Sat 12:27 PM
CDA_015RE_0300ERNGX004_PRIME	CDA_524	2005-266T18:20:10	-00T08:22	24-Sep Sat 06:37 PM	Sat 07:57 PM	24-Sep Sat 11:37 AM	Sat 12:57 PM
RADAR_015SA_GLOBALMAP002_PRIM	RADAR_364800	2005-266T18:51:00	-00T07:51	24-Sep Sat 07:03 PM	Sat 08:27 PM	24-Sep Sat 12:03 PM	Sat 01:27 PM
CDA_015DR_0300DUST080_RIDER	CDA_524	2005-266T18:55:42	-00T07:46	24-Sep Sat 07:07 PM	Sat 08:33 PM	24-Sep Sat 12:07 PM	Sat 01:33 PM
CDA_015MI_0300MIORX001_PRIME	CDA_524	2005-266T20:15:21	-00T06:26	24-Sep Sat 08:11 PM	Sun 06:28 AM	24-Sep Sat 01:11 PM	Sat 11:28 PM
CDA_015DR_0300DUST081_RIDER	CDA_524	2005-266T21:15:24	-00T05:26	25-Sep Sun 06:22 AM	Sun 06:40 AM	24-Sep Sat 11:22 PM	Sat 11:40 PM
CDA_015RE_0300ERNGX005_PRIME	CDA_524	2005-266T22:30:42	-00T04:11	25-Sep Sun 06:33 AM	Sun 06:52 AM	24-Sep Sat 11:33 PM	Sat 11:52 PM
CDA_015DR_0400DUST082_RIDER	CDA_524	2005-266T23:10:36	-00T03:31	25-Sep Sun 06:40 AM	Sun 07:00 AM	24-Sep Sat 11:40 PM	Sun 12:00 AM
CDA_015EN_0400ENORX015_PRIME	CDA_524	2005-266T23:45:35	-00T02:56	25-Sep Sun 06:45 AM	Sun 07:05 AM	24-Sep Sat 11:45 PM	Sun 12:05 AM
CIRS_015TE_STEREO001_ISS	CIRS_4000	2005-267T00:00:00	-00T02:42	25-Sep Sun 06:48 AM	Sun 07:08 AM	24-Sep Sat 11:48 PM	Sun 12:08 AM
ISS_015TE_STEREO001_PRIME	ISS_Phot_1_by_1	2005-267T00:00:00	-00T02:42	25-Sep Sun 06:48 AM	Sun 07:08 AM	24-Sep Sat 11:48 PM	Sun 12:08 AM
UVIS_015TE_ICYMAP006_ISS	UVIS_32096	2005-267T00:00:00	-00T02:42	25-Sep Sun 06:48 AM	Sun 07:08 AM	24-Sep Sat 11:48 PM	Sun 12:08 AM
CDA_015DR_0400DUST083_RIDER	CDA_524	2005-267T00:05:18	-00T02:36	25-Sep Sun 06:49 AM	Sun 07:10 AM	24-Sep Sat 11:49 PM	Sun 12:10 AM
MAG_015TE_TETAR001_RIDER	MAG_1976	2005-267T00:41:58	-00T02:00	25-Sep Sun 07:00 AM	Sun 07:23 AM	25-Sep Sun 12:00 AM	Sun 12:23 AM
CDA_015RE_0400ERNGX008_PRIME	CDA_524	2005-267T00:50:24	-00T01:51	25-Sep Sun 07:02 AM	Sun 07:25 AM	25-Sep Sun 12:02 AM	Sun 12:25 AM
CAPS_015TE_ENCOUNTER001_RIDER	CAPS_16000	2005-267T00:59:26	-00T01:42	25-Sep Sun 07:05 AM	Sun 07:29 AM	25-Sep Sun 12:05 AM	Sun 12:29 AM
CIRS_015TE_EWSCAN001_PRIME	CIRS_4000	2005-267T01:10:00	-00T01:32	25-Sep Sun 07:10 AM	Sun 07:34 AM	25-Sep Sun 12:10 AM	Sun 12:34 AM
ISS_015TE_EWSCAN001_CIRS	ISS_Phot_1_by_1	2005-267T01:10:00	-00T01:32	25-Sep Sun 07:10 AM	Sun 07:34 AM	25-Sep Sun 12:10 AM	Sun 12:34 AM
UVIS_015TE_ICYLON019_CIRS	UVIS_5032	2005-267T01:10:00	-00T01:32	25-Sep Sun 07:10 AM	Sun 07:34 AM	25-Sep Sun 12:10 AM	Sun 12:34 AM

015TE Playback Timeline **Created Sept. 16, 2005**

Event or Observation	Observation Type (APGEN)	Observation Record Start Time (yyyy-dddThh:mm:ss) (SCET)	Start Time - Reference Epoch (ddThh:mm)	Start Playback (Ground UTC)		Start Playback (Pacific Time)	
				Best Estimate	Latest Possible	Best Estimate	Latest Possible
CDA_015DR_0500DUST084_RIDER	CDA_524	2005-267T01:15:52	-00T01:26	25-Sep Sun 07:16 AM	Sun 07:41 AM	25-Sep Sun 12:16 AM	Sun 12:41 AM
CDA_015TE_0500TEORX008_PRIME	CDA_524	2005-267T01:39:22	-00T01:02	25-Sep Sun 07:40 AM	Sun 08:07 AM	25-Sep Sun 12:40 AM	Sun 01:07 AM
CIRS_015TE_ISS001_ISS	CIRS_4000	2005-267T01:40:00	-00T01:02	25-Sep Sun 07:40 AM	Sun 08:08 AM	25-Sep Sun 12:40 AM	Sun 01:08 AM
ISS_015TE_REGMAP001_PRIME	**ISS_Phot_1_by_1**	**2005-267T01:40:00**	**-00T01:02**	**25-Sep Sun 07:40 AM**	**Sun 08:08 AM**	**25-Sep Sun 12:40 AM**	**Sun 01:08 AM**
MAG_015TE_TETAR002_RIDER	MAG_1976	2005-267T01:40:00	-00T01:02	25-Sep Sun 07:40 AM	Sun 08:08 AM	25-Sep Sun 12:40 AM	Sun 01:08 AM
UVIS_015TE_ICYMAP007_ISS	UVIS_32096	2005-267T01:40:00	-00T01:02	25-Sep Sun 07:40 AM	Sun 08:08 AM	25-Sep Sun 12:40 AM	Sun 01:08 AM
CAPS_015SA_SURVEY009_RIDER	CAPS_16000	2005-267T01:59:26	-00T00:42	25-Sep Sun 07:48 AM	Sun 08:17 AM	25-Sep Sun 12:48 AM	Sun 01:17 AM
CDA_015DR_0500DUST085_RIDER	CDA_524	2005-267T02:00:32	-00T00:41	25-Sep Sun 07:49 AM	Sun 08:18 AM	25-Sep Sun 12:49 AM	Sun 01:18 AM
RPWS_015TE_TECA001_PRIME	RPWS_182784	2005-267T02:10:00	-00T00:32	25-Sep Sun 07:51 AM	Sun 08:21 AM	25-Sep Sun 12:51 AM	Sun 01:21 AM
CDA_015RE_0500ERNGX008_PRIME	CDA_524	2005-267T02:42:49	00T00:00	25-Sep Sun 08:15 AM	Sun 12:16 PM	25-Sep Sun 01:15 AM	Sun 05:16 AM
CDA_015DR_0600DUST086_RIDER	CDA_524	2005-267T03:13:49	00T00:31	25-Sep Sun 10:18 AM	Sun 12:41 PM	25-Sep Sun 03:18 AM	Sun 05:41 AM
CIRS_015TE_FP1FP3MAP001_PRIME	CIRS_4000	2005-267T03:30:00	00T00:47	25-Sep Sun 10:23 AM	Sun 12:46 PM	25-Sep Sun 03:23 AM	Sun 05:46 AM
ISS_015TE_FP1FP3MAP001_CIRS	**ISS_Phot_1_by_1**	**2005-267T03:30:00**	**00T00:47**	**25-Sep Sun 10:23 AM**	**Sun 12:46 PM**	**25-Sep Sun 03:23 AM**	**Sun 05:46 AM**
UVIS_015TE_ICYMAP008_CIRS	UVIS_32096	2005-267T03:30:00	00T00:47	25-Sep Sun 10:23 AM	Sun 12:46 PM	25-Sep Sun 03:23 AM	Sun 05:46 AM
CDA_015DI_0600DIORX009_PRIME	CDA_524	2005-267T04:07:48	00T01:25	25-Sep Sun 10:33 AM	Sun 12:59 PM	25-Sep Sun 03:33 AM	Sun 05:59 AM
CDA_015DR_0600DUST087_RIDER	CDA_524	2005-267T04:38:47	00T01:56	25-Sep Sun 10:41 AM	Sun 01:10 PM	25-Sep Sun 03:41 AM	Sun 06:10 AM
MAG_015OT_SURVEY010_PRIME	MAG_1976	2005-267T04:41:58	00T01:59	25-Sep Sun 10:41 AM	Sun 01:10 PM	25-Sep Sun 03:41 AM	Sun 06:10 AM
CDA_015RE_0700ERNGX008_PRIME	CDA_524	2005-267T05:10:26	00T02:28	25-Sep Sun 10:44 AM	Sun 01:14 PM	25-Sep Sun 03:44 AM	Sun 06:14 AM
CDA_015DR_0700DUST088_RIDER	CDA_524	2005-267T05:41:25	00T02:59	25-Sep Sun 10:48 AM	Sun 01:19 PM	25-Sep Sun 03:48 AM	Sun 06:19 AM
RADAR_015TE_SCATTRAD003_PRIME	**RADAR_364800**	**2005-267T06:00:00**	**00T03:17**	**25-Sep Sun 10:49 AM**	**Sun 01:21 PM**	**25-Sep Sun 03:49 AM**	**Sun 06:21 AM**
CDA_015RE_0800ERNGX008_PRIME	CDA_524	2005-267T06:54:56	00T04:12	25-Sep Sun 11:12 AM	Sun 01:49 PM	25-Sep Sun 04:12 AM	Sun 06:49 AM
RADAR_015SA_GLOBALMAP003_PRIM	**RADAR_364800**	**2005-267T07:31:00**	**00T04:48**	**25-Sep Sun 11:28 AM**	**Sun 02:11 PM**	**25-Sep Sun 04:28 AM**	**Sun 07:11 AM**
MIMI_015CO_SURVEY002_RIDER	**MIMI_8000**	**2005-267T07:40:00**	**00T04:57**	**25-Sep Sun 11:29 AM**	**Sun 02:12 PM**	**25-Sep Sun 04:29 AM**	**Sun 07:12 AM**
CDA_015DR_0800DUST066_RIDER	CDA_524	2005-267T07:45:55	00T05:03	25-Sep Sun 11:30 AM	Sun 02:14 PM	25-Sep Sun 04:30 AM	Sun 07:14 AM
CDA_015RH_0900RHORX008_RIDER	CDA_524	2005-267T08:45:05	00T06:02	25-Sep Sun 11:37 AM	Sun 02:27 PM	25-Sep Sun 04:37 AM	Sun 07:27 AM
CDA_015DR_0900DUST067_RIDER	CDA_524	2005-267T09:36:04	00T06:53	25-Sep Sun 11:44 AM	Sun 02:41 PM	25-Sep Sun 04:44 AM	Sun 07:41 AM