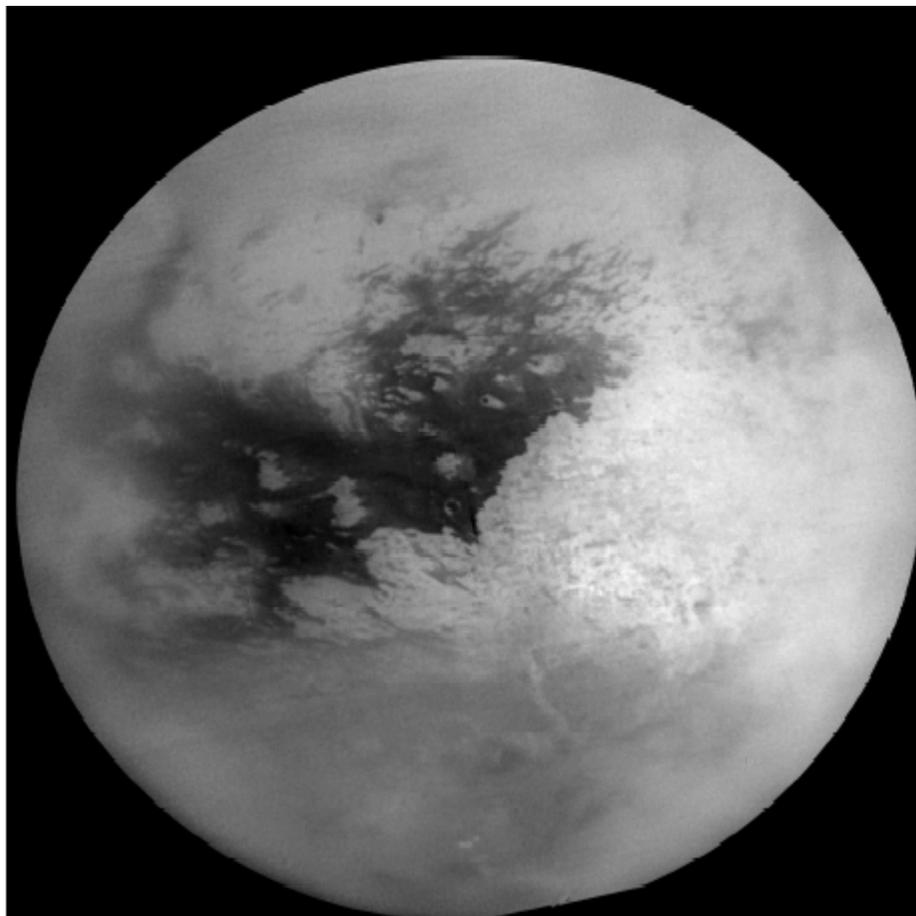


C A S S I N I



TITAN **019TI(T9)**  
MISSION DESCRIPTION

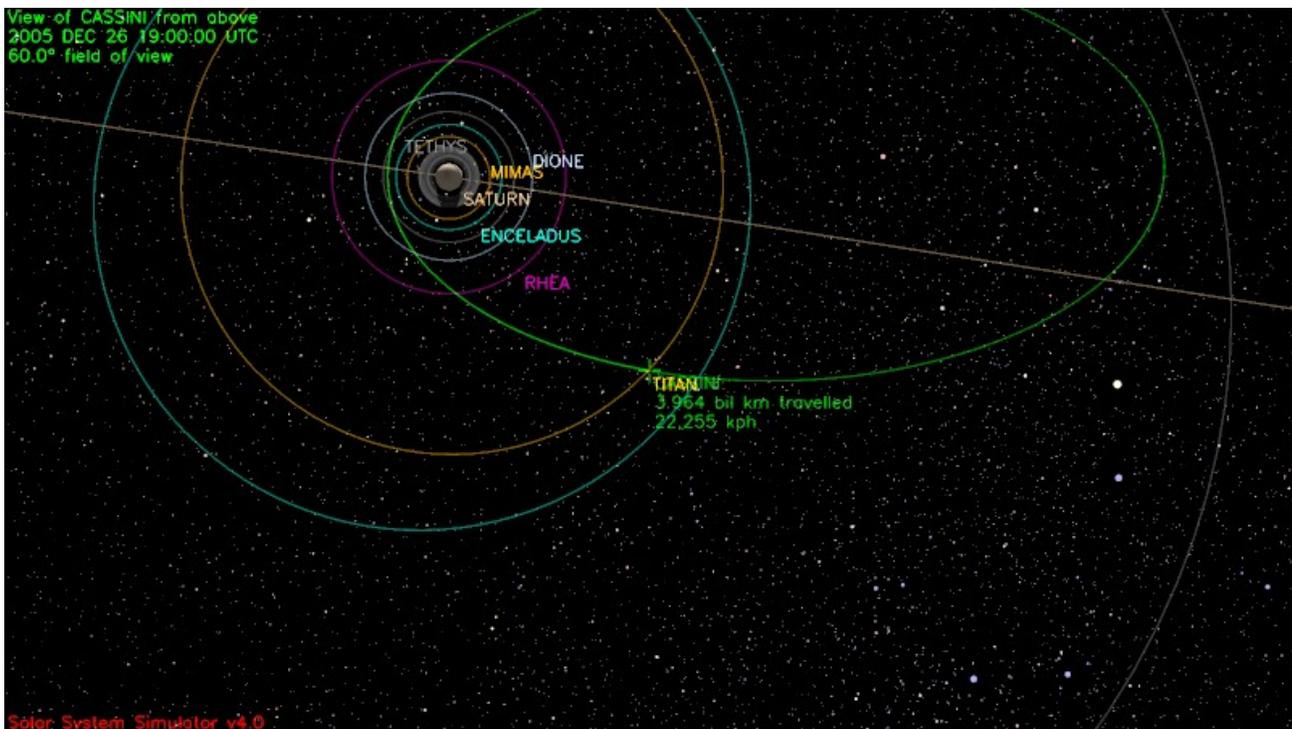
December 2005

**Jet Propulsion Laboratory**  
California Institute of Technology

## 1.0 OVERVIEW

After a nearly 2 month hiatus, Cassini returns to Titan for its ninth targeted encounter. The closest approach to Titan occurs on Monday, December 26<sup>th</sup>, at 18:59 spacecraft time (8:08 PM Pacific Time) at an altitude of 10,408 km (6,467 miles) above the surface and at a speed of 5.6 kilometers per second (12,530 mph). The latitude at closest approach is 0°(equator) and the encounter occurs on orbit number 19.

This encounter is set up with two maneuvers: an apoapsis maneuver scheduled for December 11<sup>st</sup>, and an approach maneuver, scheduled for December 23<sup>rd</sup>. However, the apoapsis maneuver is so small that it has been cancelled. This outbound encounter occurs about 2 days after Saturn closest approach.



## 1.1 ABOUT TITAN

Titan is one of the primary scientific interests of the Cassini-Huygens mission. Through observations by Earth based telescopes and the Voyager spacecraft, Titan has been revealed to be an intriguing world both similar in nature to Earth and unique among both satellites and terrestrial planets. The largest of Saturn's satellites, Titan is larger than the planets Mercury or Pluto. Titan is the only satellite in the solar system with an appreciable atmosphere. Like Earth's atmosphere, Titan's atmosphere is composed mostly of Nitrogen, yet appears to have few clouds. However, it also contains significant quantities of aerosols and organic compounds (hydrocarbons), including methane and ethane. Although Titan's thick smoggy atmosphere masks its surface, scientists have speculated Titan's surface could contain solid, liquid and muddy material creating features such as lakes, seas, or rivers. Additionally liquid reservoirs may exist beneath the surface forming geysers or volcanoes that feed flowing liquid onto the surface.

Titan's peak surface temperature is about 95 Kelvin, too cold for liquid water, and due to its thick atmosphere, the pressure at the surface is 1.6 times greater than Earth's atmosphere. At this temperature and pressure, chemicals such as methane, ethane, propane, ammonia, water-ice and acetylene may be involved in complex interior-surface-atmosphere chemical cycles resulting in eruptions, condensation and precipitation (or rain). Initial observations obtained by Cassini during the first several passes of Titan provided our first close up views of Titan in wavelengths ranging from visible light to infrared to radar. The Huygens probe successfully returned atmospheric data and images of the surface, providing ground truth for the Cassini Orbiter measurements. The results show a mysterious world even more complex than previously thought. The diversity of surface composition and its connection to Titan's geologic features remains a fundamental question. Huygens' results indicate that methane exists as a liquid just below the surface and may rain from the atmosphere periodically. Clouds in Titan's atmosphere were observed in the southern hemisphere, yet no clear explanation has emerged on what the clouds are composed of, or why more clouds do not exist. Observations of Titan's interaction with Saturn's magnetosphere indicate the presence of complex processes complicated by Titan's occasional emergence out of Saturn's magnetosphere into the solar wind.

## 1.2 TITAN-9 SCIENCE ACTIVITIES

On December 26th (DOY 360), Cassini will flyby Titan at an altitude of 10409 kilometers for a slightly late Christmas present. At this time, the Imaging Science Subsystem (ISS) will acquire a mosaic of Titan's albedo features Aztlán and Quivira, Bazaruto and Elba Faculae (the former surrounds the 80 kilometer-diameter crater), and Omacatl Macula, at low phase angle of approximately 25 degrees and pixel resolution scales of approximately 700 to 450 meters. This ISS observation will also overlap eastern portions of the TA and T03 RADAR swaths. The Composite Infrared Spectrometer (CIRS) will obtain information on trace constituents in Titan's stratosphere. An integration of the limb will obtain information on CO, HCN, and CH<sub>4</sub>. The

Ultraviolet Imaging Spectrograph (UVIS) will use the UVIS HDAC (Hydrogen-Deuterium Absorption Cell) to conduct key measurements of the Titan atmosphere as well. Measurements of the D/H ratio in the Titan atmosphere will yield clues to the formation and history of Titan and the Saturnian system. The Visual and Infrared Mapping Spectrometer (VIMS) will also obtain a medium resolution regional map using the same observing strategy as the previous Titan flyby.

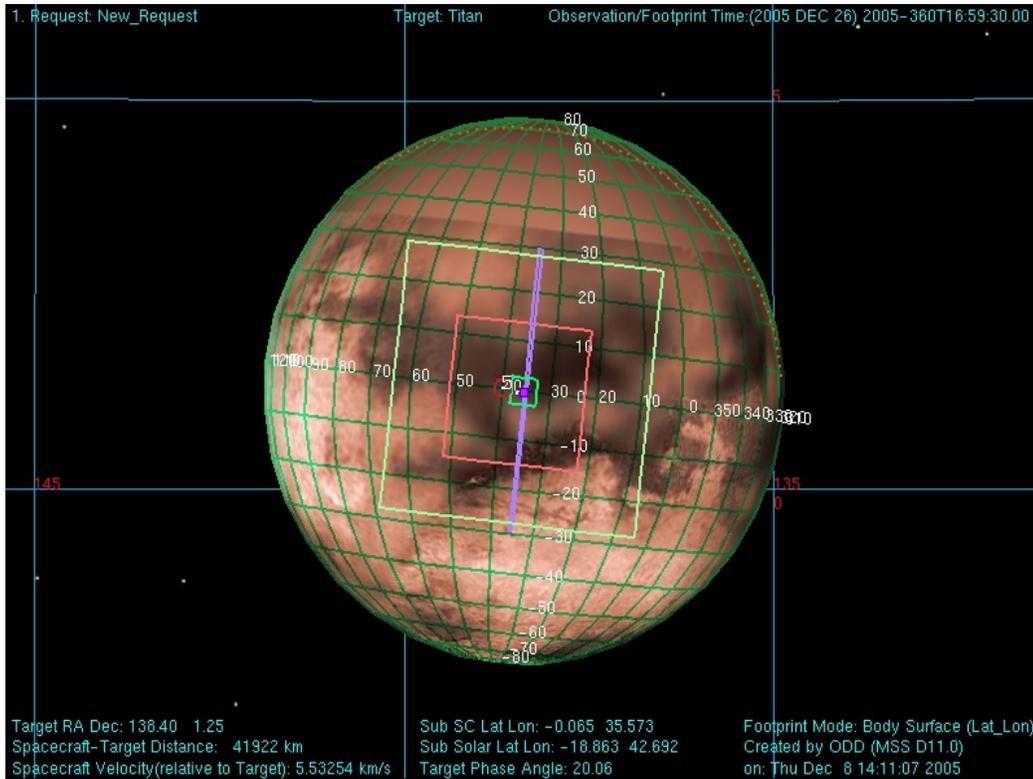
Moreover, this Titan flyby will also present an excellent diametric wake crossing at 5.04 Titan Radii downstream for all of the Magnetospheric and Plasma Science (MAPS) instruments, as it will ultimately be ideal for comparisons to the Voyager-1 Titan flyby data set. Cassini's tail encounter will possess similar observing geometry as the tail encounter of Voyager-1 in November 1980. Especially with the increased capability of Cassini, the MAPS instruments will finally be able to compare the Cassini and Voyager data sets to further study Titan's atmospheric loss and the structure of Titan's plasma wake. But more importantly, this flyby will represent the only tail crossing at an intermediate distance in the planned Cassini Titan Tour, which will be highly valuable for the study of the formation of Titan's magnetotail as a function of distance.

### 1.3 SAMPLE SNAPSHOTS

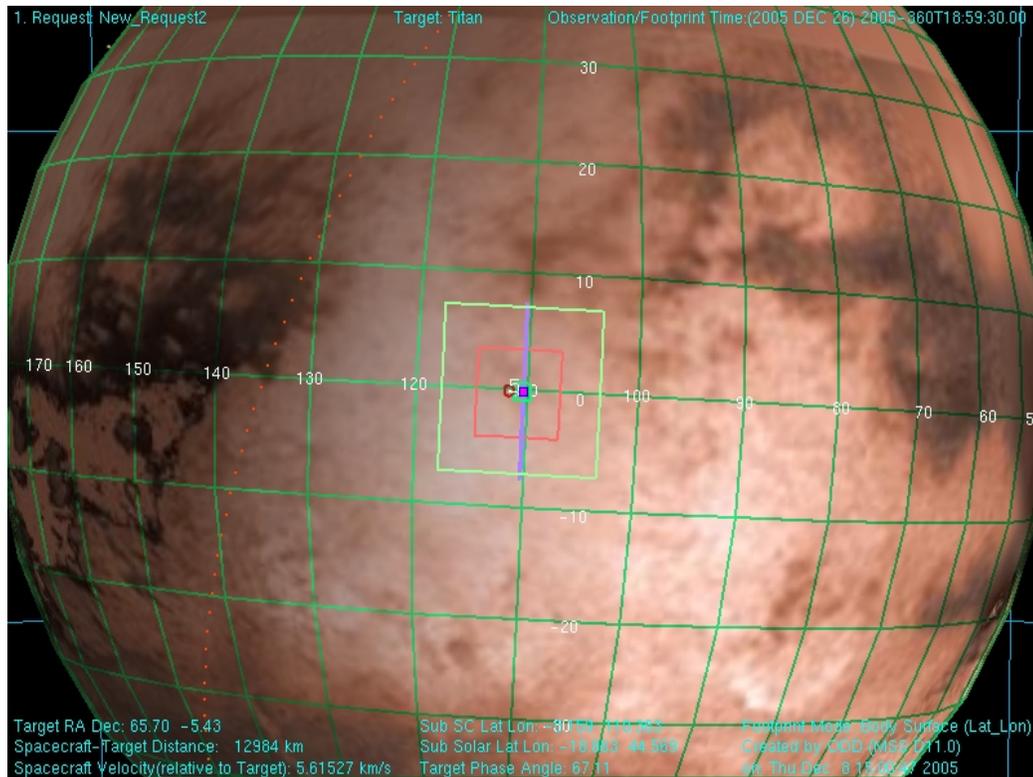
Three views of Titan from Cassini before, during, and after closest approach to Titan are shown below. The views are oriented such that the direction towards the top of the page is aligned with the Titan North Pole. Sample remote sensing instrument fields of view are drawn assuming that Cassini is pointed towards the center of Titan. The size of these fields of view vary as a function of the distance between Cassini and Titan. A key for use in identifying these instruments fields of view in the figures is listed below.

**Key to Instrument Fields of View in Figures**

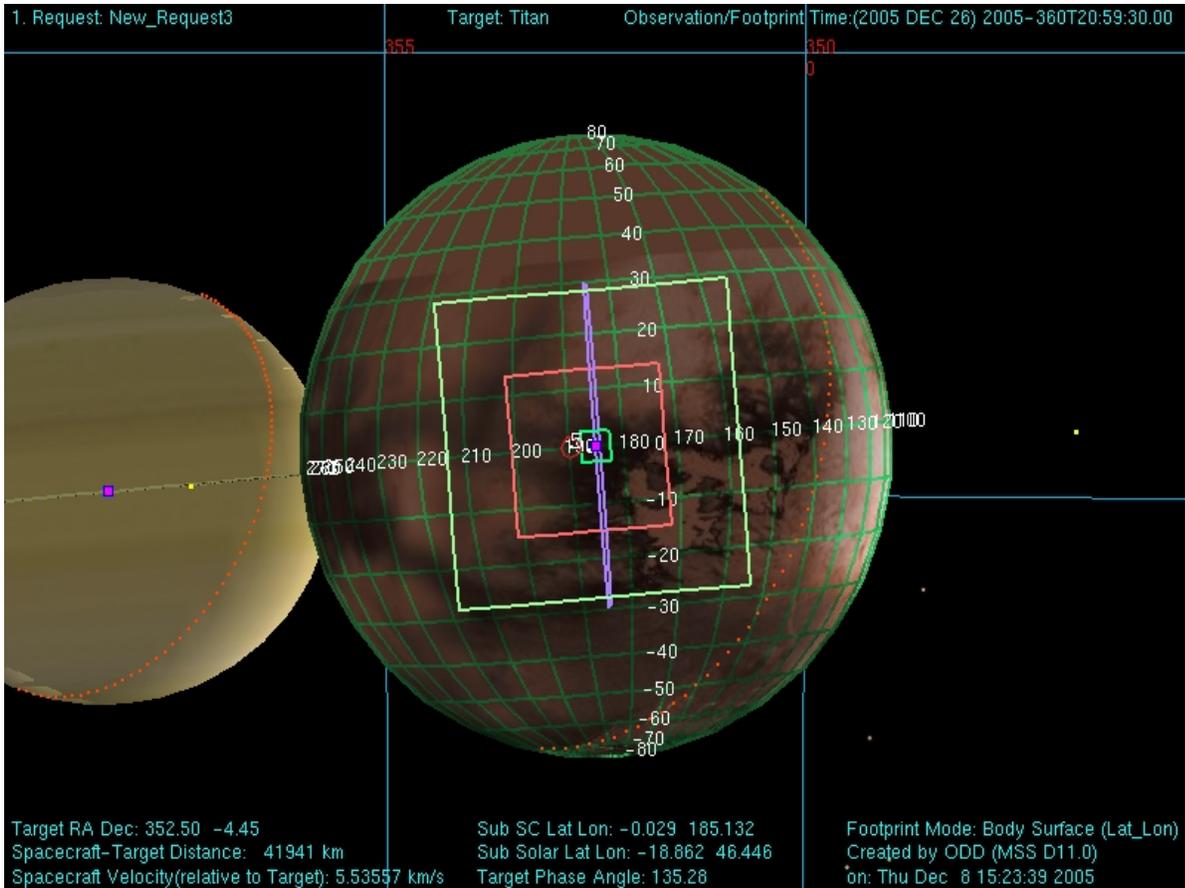
<b>Instrument Field of View</b>	<b>Depiction in Figure</b>
ISS WAC (imaging wide angle camera)	Largest square
VIMS (visual and infrared mapping spectrometer)	Next smallest pink square
ISS NAC (imaging narrow angle camera)	Smallest green square
CIRS (composite infrared spectrometer) – Focal Plane 1	Small red circle near ISS_NAC FOV
UVIS (ultraviolet imaging spectrometer)	Vertical purple rectangle centered within largest square



**View of Titan from Cassini 2 hours Before Closest Approach (above)**



**View of Titan from Cassini at Closest Approach (above)**



**View of Titan from Cassini 2 hours After Closest Approach**

## Timeline and Geometry Table below –

Cassini Titan-9 Timeline - December 2005						Colors: yellow = maneuvers; blue = geometry; pink = T9-related; green = data playbacks
Orbiter UTC	Ground UTC	Pacific Time	Time wrt T9	Activity	Description	
351T14:21:00	Dec 17 15:29	Sat Dec 17 07:29 AM	T9-09d05h	Start of Sequence S08	Start of Sequence which contains Titan-9.	
357T06:25:00	Dec 23 07:33	Thu Dec 22 11:33 PM	T9-03d13h	OTM #46 Prime	Titan-9 minus 3 day targeting maneuver	
358T04:40:00	Dec 24 05:48	Fri Dec 23 09:48 PM	T9-02d14h	OTM #46 Backup		
360T06:59:00	Dec 26 08:07	Mon Dec 26 12:07 AM	T9-12h00m	Start of the TOST Segment		
360T06:59:00	Dec 26 08:07	Mon Dec 26 12:07 AM	T9-12h00m	Turn cameras to Titan		
360T07:34:30	Dec 26 08:42	Mon Dec 26 12:42 AM	T9-11h25m	Deadtime	15 minutes long; used to accommodate changes in flyby time	
360T07:49:30	Dec 26 08:57	Mon Dec 26 12:57 AM	T9-11h10m	Titan limb observations	Examine trace constituents in Titan's stratosphere.	
360T12:59:30	Dec 26 14:07	Mon Dec 26 06:07 AM	T9-06h00m	Titan atmospheric Observations	Examine wind/cloud motions and capture a low-phase global map	
360T14:59:30	Dec 26 16:07	Mon Dec 26 08:07 AM	T9-04h00m	Titan surface observations	Examine Titan's specular point	
360T18:59:30	Dec 26 20:07	Mon Dec 26 12:07 PM	T9+00h00m	Titan-9 Flyby Closest Approach Time	Altitude = 1577 km (980 miles), speed = 5.95 km/s (13,400 mph); low phase inbound, 98.4 deg phase at closest approach, high phase outbound	
360T21:29:30	Dec 26 22:37	Mon Dec 26 02:37 PM	T9+02h30m	Titan surface observations	Several slow scans across Titan's visible hemisphere to form spectral images	
361T03:53:30	Dec 27 05:01	Mon Dec 26 09:01 PM	T9+08h54m	Deadtime	15 minutes long; used to accommodate changes in flyby time	
361T04:04:00	Dec 27 05:12	Mon Dec 26 09:12 PM	T9+09h05m	Turn to Earth-Line		
361T04:34:00	Dec 27 05:42	Mon Dec 26 09:42 PM	T9+09h35m	Begin Playback of T9 Data	Goldstone 70M	
361T13:34:00	Dec 27 14:42	Tue Dec 27 06:42 AM	T9+18h35m	End Playback of T9 Data		
363T23:00:08	Dec 30 00:08	Thu Dec 29 04:08 PM	T9+03d04h	Descending Ring Plane Crossing		
005T14:08:54	Jan 05 15:16	Wed Jan 05 07:16 AM	T9-355d05h	Saturn Apoapse	Per = 23.4 d, inc = 0.4 deg, r = 48.3 Rs, phase = 94 deg	
QWLT (mins)	68.8					
C/A Time	Mon Dec 26 12:07 PM					

# 1.4 T9 FLYBY GEOMETRY

Event Name: T9 19TI, Targeted Titan, Outbound, 050505 SPK; Table Creation Date (YYMMDD) 050712																		
Event Name at Event Time Only	SCET Date (YYYY-DOYTHH:MM:SS,FF) UTC	SCET Date (MM/DD/YYYY HH:MM:SS) UTC	SCET Date (MM/DD/YYYY HH:MM:SS) ET	Hours wrt Event Epoch	Minutes wrt Event Epoch	S/C Range (km)	S/C Altitude wrt Tri-axial Ellipsoid (km)	S/C North Latitude (deg)	S/C West Longitude SMEQPM Date (deg)	S/C Inertial Velocity (km/s)	S/C Radial Inertial Velocity (km/s)	S/C Tangential Inertial Velocity (km/s)	Central Body Angular Diameter (mrad)	Phase = Sun-Central-Body-SC Angle (deg)	Sun-S/C Central Body Angle (deg)	S/C Local True Solar Time wrt Central Body (hh:mm)	Sub-solar Latitude wrt Central Body (deg)	Sub-solar West Longitude wrt Central Body SMEQPM Date (deg)
2005-359T18:59:30.10	25-Dec-05	19:00:34	19:00:34	-24	-1440	505,590.9	503,015.9	0.0	-3.0	6,780	-6,774	0.272	10.2	31.0	149.0	13.40	-18.9	22.0
2005-359T22:59:30.10	25-Dec-05	23:00:34	23:00:34	-20	-1200	411,990.0	409,415.0	0.0	1.3	6,268	-6,260	0.314	12.5	30.5	149.4	13.37	-18.9	25.8
2005-360T00:59:30.10	25-Dec-05	01:00:34	01:00:34	-18	-1080	367,621.7	365,046.7	0.0	3.5	6,080	-6,071	0.324	14.0	30.3	149.7	13.36	-18.9	27.7
2005-360T02:59:30.10	25-Dec-05	03:00:34	03:00:34	-16	-960	324,481.2	321,906.2	0.0	5.8	5,927	-5,918	0.334	15.9	30.0	150.0	13.35	-18.9	29.5
2005-360T04:59:30.10	25-Dec-05	05:00:34	05:00:34	-14	-840	282,331.6	279,756.6	0.0	8.1	5,805	-5,795	0.349	18.2	29.6	150.4	13.33	-18.9	31.4
2005-360T06:59:30.10	25-Dec-05	07:00:34	07:00:34	-12	-720	240,973.5	238,398.5	0.0	10.6	5,710	-5,697	0.374	21.4	29.2	150.8	13.30	-18.9	33.3
2005-360T08:59:30.10	25-Dec-05	09:00:34	09:00:34	-10	-600	200,240.0	197,665.0	0.0	13.2	5,636	-5,621	0.417	25.7	28.6	151.4	13.27	-18.9	35.2
2005-360T10:59:30.10	25-Dec-05	11:00:34	11:00:34	-8	-480	159,995.4	157,420.4	0.0	16.1	5,582	-5,561	0.492	32.2	27.9	152.1	13.23	-18.9	37.1
2005-360T12:59:30.10	25-Dec-05	13:00:34	13:00:34	-6	-360	120,142.2	117,567.2	0.0	19.7	5,546	-5,510	0.629	42.9	26.7	153.3	13.17	-18.9	38.9
2005-360T13:59:30.10	25-Dec-05	14:00:34	14:00:34	-5	-300	100,350.4	97,775.4	0.0	21.9	5,534	-5,484	0.742	51.3	25.8	154.2	13.11	-18.9	39.9
2005-360T14:59:30.10	25-Dec-05	15:00:34	15:00:34	-4	-240	80,662.7	78,087.7	0.0	24.7	5,527	-5,451	0.915	63.9	24.6	155.4	13.04	-18.9	40.8
2005-360T15:59:30.10	25-Dec-05	16:00:34	16:00:34	-3	-180	61,129.6	58,554.6	0.0	28.7	5,526	-5,394	1.199	84.3	22.7	157.3	12.52	-18.9	41.8
2005-360T16:59:30.10	25-Dec-05	17:00:34	17:00:34	-2	-120	41,921.8	39,346.8	-0.1	35.6	5,533	-5,251	1.742	122.9	20.1	159.9	12.28	-18.9	42.7
2005-360T17:59:30.10	25-Dec-05	18:00:34	18:00:34	-1	-60	23,812.2	21,237.2	-0.1	51.8	5,559	-4,640	3.062	216.7	20.4	159.6	11.27	-18.9	43.6
2005-360T18:29:30.10	25-Dec-05	18:30:34	18:30:34	-1	-30	16,381.6	13,806.6	-0.1	71.9	5,590	-3,382	4.451	315.7	33.1	146.9	10.08	-18.9	44.1
2005-360T18:44:30.10	25-Dec-05	18:45:34	18:45:34	0	-15	13,911.5	11,336.5	-0.2	88.8	5,607	-1,993	5.241	372.3	47.5	132.5	09.01	-18.9	44.3
2005-360T18:54:30.10	25-Dec-05	18:55:34	18:55:34	0	-5	13,089.9	10,514.9	-0.2	102.9	5,614	-0,706	5.570	396.0	60.2	119.8	08.06	-18.9	44.5
<b>T9 19TI 2005-360T18:59:30.10</b>	<b>25-Dec-05</b>	<b>19:00:34</b>	<b>19:00:34</b>	<b>0</b>	<b>0</b>	<b>12,983.7</b>	<b>10,408.7</b>	<b>-0.2</b>	<b>110.4</b>	<b>5,615</b>	<b>0,001</b>	<b>5,615</b>	<b>399.3</b>	<b>67.1</b>	<b>112.9</b>	<b>07.36</b>	<b>-18.9</b>	<b>44.6</b>
2005-360T19:04:30.10	25-Dec-05	19:05:34	19:05:34	0	5	13,090.3	10,515.3	-0.2	117.8	5,614	0,707	5,570	396.0	74.1	105.9	07.07	-18.9	44.6
2005-360T19:14:30.10	25-Dec-05	19:15:34	19:15:34	0	15	13,912.8	11,337.8	-0.1	131.9	5,607	1,995	5,241	372.3	87.2	92.8	06.11	-18.9	44.8
2005-360T19:29:30.10	25-Dec-05	19:30:34	19:30:34	1	30	16,384.2	13,809.2	-0.1	148.9	5,590	3,383	4,450	315.6	103.0	77.0	05.04	-18.9	45.0
2005-360T19:59:30.10	25-Dec-05	20:00:34	20:00:34	1	60	23,818.5	21,243.5	-0.1	169.0	5,561	4,642	3,062	216.6	121.4	58.6	03.46	-18.9	45.5
2005-360T20:59:30.10	25-Dec-05	21:00:34	21:00:34	2	120	41,940.7	39,365.7	0.0	-174.9	5,536	5,255	1,739	122.9	135.3	44.7	02.45	-18.9	46.4
2005-360T21:59:30.10	25-Dec-05	22:00:34	22:00:34	3	180	61,166.5	58,591.5	0.0	-188.1	5,529	5,399	1,191	84.2	140.4	39.6	02.21	-18.9	47.4
2005-360T22:59:30.10	25-Dec-05	23:00:34	23:00:34	4	240	80,719.6	78,144.6	0.0	-184.1	5,530	5,457	0,899	63.8	143.0	37.0	02.09	-18.9	48.3
2005-360T23:59:30.10	25-Dec-05	00:00:34	00:00:34	5	300	100,424.8	97,849.8	0.0	-161.3	5,535	5,488	0,718	51.3	144.6	35.4	02.02	-18.9	49.3
2005-361T00:59:30.10	27-Dec-05	01:00:34	01:00:34	6	360	120,225.6	117,650.6	0.0	-159.1	5,543	5,511	0,594	42.8	145.6	34.4	01.57	-18.9	50.2
2005-361T02:59:30.10	27-Dec-05	03:00:34	03:00:34	8	480	160,040.2	157,465.2	0.0	-155.7	5,564	5,548	0,431	32.2	146.8	33.2	01.51	-18.9	52.1
2005-361T04:59:30.10	27-Dec-05	05:00:34	05:00:34	10	600	200,107.0	197,532.0	0.0	-153.0	5,591	5,582	0,323	25.7	147.5	32.5	01.47	-18.9	54.0
2005-361T06:59:30.10	27-Dec-05	07:00:34	07:00:34	12	720	240,425.5	237,850.5	0.0	-150.6	5,623	5,618	0,242	21.4	148.0	32.0	01.45	-18.9	55.8
2005-361T08:59:30.10	27-Dec-05	09:00:34	09:00:34	14	840	281,008.2	278,433.2	0.0	-148.4	5,658	5,655	0,174	18.3	148.2	31.8	01.44	-18.9	57.7
2005-361T10:59:30.10	27-Dec-05	11:00:34	11:00:34	16	960	321,869.2	319,294.2	0.0	-146.3	5,696	5,695	0,113	16.0	148.4	31.6	01.43	-18.9	59.6
2005-361T12:59:30.10	27-Dec-05	13:00:34	13:00:34	18	1080	363,021.6	360,446.6	0.0	-144.3	5,737	5,736	0,056	14.2	148.5	31.5	01.43	-18.9	61.5
2005-361T14:59:30.10	27-Dec-05	15:00:34	15:00:34	20	1200	404,476.5	401,901.5	0.0	-142.4	5,779	5,779	0,001	12.7	148.5	31.5	01.42	-18.9	63.3
2005-361T18:59:30.10	27-Dec-05	19:00:34	19:00:34	24	1440	488,325.6	485,750.6	0.0	-138.7	5,868	5,867	0,110	10.5	148.4	31.6	01.43	-18.9	67.1

# 1.5 T9 DATA PLAYBACK TIMELINE

For each science observation, the table below contains a time-ordered listing of the data playback times. One-way light time at the time of the encounter is 1 hour and 9 minutes.

019TI (T9) Playback Timeline				Created Dec 9, 2005			
Event or Observation	Observation Type (APGEN)	Observation Record Start Time (yyyy-dddThh:mm:ss) (SCET)	Record Start Time - Reference Epoch (ddThh:mm)	Start Playback (Ground UTC)		Start Playback (Pacific Time)	
				Best Estimate	Latest Possible	Best Estimate	Latest Possible
MAG_019CO_MAGBOUND004_MAPS	MAG_1976	2005-351T14:21:00	-09T04:37	18-Dec Sun 06:30 AM	Sun 06:30 AM	17-Dec Sat 10:30 PM	Sat 10:30 PM
MAG_019CO_TINTERACT002_RIDER	MAG_1976	2005-360T06:59:00	-00T12:00	27-Dec Tue 05:47 AM	Tue 05:47 AM	26-Dec Mon 09:47 PM	Mon 09:47 PM
MIMI_019TI_T9EXTINB001_CIRS	MIMI_8000	2005-360T06:59:00	-00T12:00	27-Dec Tue 05:47 AM	Tue 05:47 AM	26-Dec Mon 09:47 PM	Mon 09:47 PM
RPWS_019CO_TINTERACT001_UVIS	RPWS_30464	2005-360T06:59:00	-00T12:00	27-Dec Tue 05:47 AM	Tue 05:47 AM	26-Dec Mon 09:47 PM	Mon 09:47 PM
CIRS_019TI_FIRNADCMP002_PRIME	CIRS_4000	2005-360T07:49:30	-00T11:09	27-Dec Tue 05:51 AM	Tue 05:52 AM	26-Dec Mon 09:51 PM	Mon 09:52 PM
CIRS_019TI_FIRNADCMP002_SI	ISS_SUPPORT_IMAGING	2005-360T07:49:30	-00T11:09	27-Dec Tue 05:51 AM	Tue 05:52 AM	26-Dec Mon 09:51 PM	Mon 09:52 PM
ISS_019TI_FIRNADCMP002_CIRS	ISS_Phot_1_by_1	2005-360T07:49:30	-00T11:09	27-Dec Tue 05:51 AM	Tue 05:52 AM	26-Dec Mon 09:51 PM	Mon 09:52 PM
UVIS_019TI_FIRNADCMP003_CIRS	UVIS_5032	2005-360T07:49:30	-00T11:09	27-Dec Tue 05:51 AM	Tue 05:52 AM	26-Dec Mon 09:51 PM	Mon 09:52 PM
VIMS_019TI_NADIRCOMP001_CIRS	VIMS_18432	2005-360T07:49:30	-00T11:09	27-Dec Tue 05:51 AM	Tue 05:52 AM	26-Dec Mon 09:51 PM	Mon 09:52 PM
CIRS_019TI_FIRNADMAP006_VIMS	CIRS_4000	2005-360T09:59:30	-00T08:59	27-Dec Tue 06:24 AM	Tue 06:34 AM	26-Dec Mon 10:24 PM	Mon 10:34 PM
ISS_019TI_MEDRES001_VIMS	ISS_Phot_1_by_1	2005-360T09:59:30	-00T08:59	27-Dec Tue 06:24 AM	Tue 06:34 AM	26-Dec Mon 10:24 PM	Mon 10:34 PM
UVIS_019TI_MEDRES001_VIMS	UVIS_5032	2005-360T09:59:30	-00T08:59	27-Dec Tue 06:24 AM	Tue 06:34 AM	26-Dec Mon 10:24 PM	Mon 10:34 PM
VIMS_019TI_MEDRES001_PRIME	VIMS_18432	2005-360T09:59:30	-00T08:59	27-Dec Tue 06:24 AM	Tue 06:34 AM	26-Dec Mon 10:24 PM	Mon 10:34 PM
CAPS_019TI_T9EXTINB002_CIRS	CAPS_16000	2005-360T10:00:00	-00T08:59	27-Dec Tue 06:24 AM	Tue 06:34 AM	26-Dec Mon 10:24 PM	Mon 10:34 PM
CDA_019RI_1800RINGM016_RIDER	CDA_524	2005-360T10:32:37	-00T08:26	27-Dec Tue 06:34 AM	Tue 06:47 AM	26-Dec Mon 10:34 PM	Mon 10:47 PM
CDA_019DR_1900DUST108_RIDER	CDA_524	2005-360T12:33:36	-00T06:25	27-Dec Tue 07:08 AM	Tue 07:35 AM	26-Dec Mon 11:08 PM	Mon 11:35 PM
ISS_019TI_GLBMAPNL001_PRIME	ISS_Phot_1_by_1	2005-360T12:59:30	-00T05:59	27-Dec Tue 07:15 AM	Tue 07:46 AM	26-Dec Mon 11:15 PM	Mon 11:46 PM
UVIS_019TI_GLOBMAP001_ISS	UVIS_5032	2005-360T12:59:30	-00T05:59	27-Dec Tue 07:15 AM	Tue 07:46 AM	26-Dec Mon 11:15 PM	Mon 11:46 PM
VIMS_019TI_GBMAPHDAC001_ISS	VIMS_18432	2005-360T12:59:30	-00T05:59	27-Dec Tue 07:15 AM	Tue 07:46 AM	26-Dec Mon 11:15 PM	Mon 11:46 PM
CIRS_019TI_FIRNADMAP007_ISS	CIRS_4000	2005-360T13:59:30	-00T04:59	27-Dec Tue 07:33 AM	Tue 08:09 AM	26-Dec Mon 11:33 PM	Tue 12:09 AM
CIRS_019TI_FIRNADCMP003_UVIS	CIRS_4000	2005-360T14:59:30	-00T03:59	27-Dec Tue 07:50 AM	Tue 08:32 AM	26-Dec Mon 11:50 PM	Tue 12:32 AM
ISS_019TI_HDAC001_UVIS	ISS_Phot_1_by_1	2005-360T14:59:30	-00T03:59	27-Dec Tue 07:50 AM	Tue 08:32 AM	26-Dec Mon 11:50 PM	Tue 12:32 AM
MAG_019CO_MAGTITAN001_PRIME	MAG_1976	2005-360T14:59:30	-00T03:59	27-Dec Tue 07:50 AM	Tue 08:32 AM	26-Dec Mon 11:50 PM	Tue 12:32 AM
UVIS_019TI_HDAC001_PRIME	UVIS_5032	2005-360T14:59:30	-00T03:59	27-Dec Tue 07:50 AM	Tue 08:32 AM	26-Dec Mon 11:50 PM	Tue 12:32 AM
VIMS_019TI_HDAC001_UVIS	VIMS_18432	2005-360T14:59:30	-00T03:59	27-Dec Tue 07:50 AM	Tue 08:32 AM	26-Dec Mon 11:50 PM	Tue 12:32 AM
RPWS_019TI_TIINTRMED001_PRIME	RPWS_30464	2005-360T16:59:30	-00T01:59	27-Dec Tue 08:18 AM	Tue 09:06 AM	27-Dec Tue 12:18 AM	Tue 01:06 AM
CAPS_019TI_T9CLOSE001_UVIS	CAPS_16000	2005-360T17:59:30	-00T00:59	27-Dec Tue 08:36 AM	Tue 10:50 AM	27-Dec Tue 12:36 AM	Tue 02:50 AM
INMS_019TI_T9CLOSE001_UVIS	INMS_1498	2005-360T17:59:30	-00T00:59	27-Dec Tue 08:36 AM	Tue 10:50 AM	27-Dec Tue 12:36 AM	Tue 02:50 AM
MIMI_019TI_T9CLOSE001_UVIS	MIMI_8000	2005-360T17:59:30	-00T00:59	27-Dec Tue 08:36 AM	Tue 10:50 AM	27-Dec Tue 12:36 AM	Tue 02:50 AM
RPWS_019TI_TICA001_PRIME	RPWS_182784	2005-360T18:32:00	-00T00:26	27-Dec Tue 08:49 AM	Tue 11:05 AM	27-Dec Tue 12:49 AM	Tue 03:05 AM
RPWS_019TI_TIINTRMED002_PRIME	RPWS_30464	2005-360T19:20:20	00T00:21	27-Dec Tue 10:47 AM	Tue 11:57 AM	27-Dec Tue 02:47 AM	Tue 03:57 AM
CAPS_019TI_T9EXTOUT001_UVIS	CAPS_16000	2005-360T19:59:30	00T01:00	27-Dec Tue 11:05 AM	Tue 12:18 PM	27-Dec Tue 03:05 AM	Tue 04:18 AM
INMS_019TI_T9OUTBD001_UVIS	INMS_1498	2005-360T19:59:30	00T01:00	27-Dec Tue 11:05 AM	Tue 12:18 PM	27-Dec Tue 03:05 AM	Tue 04:18 AM
MIMI_019TI_T9EXTOUT001_UVIS	MIMI_8000	2005-360T19:59:30	00T01:00	27-Dec Tue 11:05 AM	Tue 12:18 PM	27-Dec Tue 03:05 AM	Tue 04:18 AM
CIRS_019TI_FIRNADMAP005_UVIS	CIRS_4000	2005-360T21:29:30	00T02:30	27-Dec Tue 11:29 AM	Tue 12:47 PM	27-Dec Tue 03:29 AM	Tue 04:47 AM
ISS_019TI_EUVFUV001_UVIS	ISS_Phot_1_by_1	2005-360T21:29:30	00T02:30	27-Dec Tue 11:29 AM	Tue 12:47 PM	27-Dec Tue 03:29 AM	Tue 04:47 AM
UVIS_019TI_EUVFUV001_PRIME	UVIS_5032	2005-360T21:29:30	00T02:30	27-Dec Tue 11:29 AM	Tue 12:47 PM	27-Dec Tue 03:29 AM	Tue 04:47 AM
VIMS_019TI_HDACEUV001_UVIS	VIMS_18432	2005-360T21:29:30	00T02:30	27-Dec Tue 11:29 AM	Tue 12:47 PM	27-Dec Tue 03:29 AM	Tue 04:47 AM
MAG_019CO_TINTERACT003_RIDER	MAG_1976	2005-360T22:59:30	00T04:00	27-Dec Tue 11:42 AM	Tue 01:04 PM	27-Dec Tue 03:42 AM	Tue 05:04 AM
RSS_019TI_KADOWN002_RSS	RSS_Activity	2005-361T02:09:20	00T07:30	27-Dec Tue 12:12 PM	Tue 01:44 PM	27-Dec Tue 04:12 AM	Tue 05:44 AM
UVIS_019SW_IPHSURVEY027_RIDER	UVIS_5032	2005-361T04:34:00	00T09:34	27-Dec Tue 09:19 AM	Tue 09:19 AM	27-Dec Tue 01:19 AM	Tue 01:19 AM
CIRS_019IC_DSCAL1293_RIDER	CIRS_4000	2005-361T05:02:00	00T10:03	27-Dec Tue 09:21 AM	Tue 09:21 AM	27-Dec Tue 01:21 AM	Tue 01:21 AM
CAPS_019TI_T9EXTOUT002_UVIS	CAPS_16000	2005-361T05:04:00	00T10:05	27-Dec Tue 09:21 AM	Tue 09:21 AM	27-Dec Tue 01:21 AM	Tue 01:21 AM
RPWS_019CO_HIRATE006_CAPS	RPWS_30464	2005-361T06:00:00	00T11:01	27-Dec Tue 09:31 AM	Tue 09:33 AM	27-Dec Tue 01:31 AM	Tue 01:33 AM
CDA_019HY_2400HYORX015_RIDER	CDA_524	2005-361T06:53:02	00T11:54	27-Dec Tue 10:01 AM	Tue 10:06 AM	27-Dec Tue 02:01 AM	Tue 02:06 AM
CDA_019DR_2500DUST109_RIDER	CDA_524	2005-361T08:54:01	00T13:55	27-Dec Tue 10:26 AM	Tue 10:34 AM	27-Dec Tue 02:26 AM	Tue 02:34 AM
CAPS_019SA_SURVEY006_RIDER	CAPS_16000	2005-361T09:34:00	00T14:35	27-Dec Tue 12:30 PM	Tue 02:04 PM	27-Dec Tue 04:30 AM	Tue 06:04 AM
MAG_019OT_SURVEY006_RIDER	MAG_1976	2005-361T09:34:56	00T14:35	27-Dec Tue 12:30 PM	Tue 02:04 PM	27-Dec Tue 04:30 AM	Tue 06:04 AM
RPWS_019SA_OUTSURVEY002_PRIME	RPWS_30464	2005-361T09:34:56	00T14:35	27-Dec Tue 12:30 PM	Tue 02:04 PM	27-Dec Tue 04:30 AM	Tue 06:04 AM
INMS_019SA_SURVEY004_RIDER	INMS_1498	2005-361T09:39:36	00T14:40	27-Dec Tue 12:30 PM	Tue 02:04 PM	27-Dec Tue 04:30 AM	Tue 06:04 AM
CAPS_019CO_BURST16K003_RIDER	CAPS_16000	2005-361T10:30:00	00T15:31	27-Dec Tue 12:34 PM	Tue 02:08 PM	27-Dec Tue 04:34 AM	Tue 06:08 AM
CAPS_019SA_SURVEY003_RIDER	CAPS_16000	2005-361T13:33:00	00T18:33	27-Dec Tue 02:42 PM	Tue 02:42 PM	27-Dec Tue 06:42 AM	Tue 06:42 AM
INMS_019SA_SURVEY005_RIDER	INMS_1498	2005-361T13:33:00	00T18:33	27-Dec Tue 02:42 PM	Tue 02:42 PM	27-Dec Tue 06:42 AM	Tue 06:42 AM
RPWS_019SA_OUTSURVEY005_PRIME	RPWS_30464	2005-361T13:33:00	00T18:33	27-Dec Tue 02:42 PM	Tue 02:42 PM	27-Dec Tue 06:42 AM	Tue 06:42 AM
MIMI_019CO_SURVEY004_MAPS	MIMI_8000	2005-361T13:33:30	00T18:34	28-Dec Wed 05:30 AM	Wed 05:30 AM	27-Dec Tue 09:30 PM	Tue 09:30 PM