Cassini Solstice Mission Titan Flyby Summary

TIMING — REFERENCE TRAJECTORY 110818 — Revision 9, 140220

RANGE (KM) ------> 290k 200k 140k 81k 81k 140k 200k 290k

Angular Diameter (degrees) 0.5 0.7 1.1 1.8 33-degrees @ 15 mins

Inbound to c/a (hours) -22 … -1 | Outbound from c/a (hours) 1 … 26

Flyby		REV	SEQ	Date	DOY	C/A Time	Hyd gms	Alt	Inbound to c/a (hours)	Outbound from c/a (hours)	Illum.	Bound	Dec-Hr	Dual pb?	C/A LAT (deg)	C/A LON (deg)	Phase @C/A (deg)	Flyby
T71	In - 1	134	S61	07/07/10	188	00:22:45	192.4	1004	Dual PB error; CIRS; RADAR; CAPS; IN; CAPS; RADAR; VIMS; C70			Out	16.035		-56.2	303.6	82	T71
T72	In - 1	138	S63	09/24/10	267	18:38:41		8178	CIRS	VIMS; UVIS; VIMS; C70		Out	15.958		-14.7	290.5	60	T72
T73	In - 1	140	S64	11/11/10	315	13:37:02		7926	Safing; VIMS; CAPS; CIRS; VIMS; G70			Out	15.828		-35.5	108.2	121	T73
T74	Equatorial - 1	145	S66	02/18/11	049	16:04:11		3651	CIRS	CAPS with HGA to Earth for RSS; CIRS; C70		IN	20.621		0.1	244.5	62	T74
T75	Equatorial - 1	147	S67	04/19/11	109	05:00:39		10053		CAPS; UVIS; G70		Out	14.254		0.1	106.9	101	T75
T76	Equatorial - 1	148	S68	05/08/11	128	22:53:44		1873	CIRS	VIMS; UVIS; VIMS; CIRS; G70		IN	19.787		0.0	247.6	47	T76
T77	Equatorial - 1	149	S68	06/20/11	171	18:32:01		1359	No Dual PB, DSN negotiations; UVIS	RADAR; CIRS; VIMS; CIRS; G70		Out	12.248		0.1	106	73	T77
T78	Equatorial - 1	153	S70	09/12/11	255	02:50:06		5821	CIRS	UVIS; CAPS; UVIS; G70		IN	17.55	UV	-0.4	60.23	159	T78
T79	Equatorial - 1	158	S71	12/13/11	347	20:11:24		3583	Originally CAPS; CIRS	VIMS; CIRS; C70		Out	12.786		7.4	290.9	100	T79
T80	Equatorial - 1	159	S71	01/02/12	002	15:13:38		29514	CIRS	ISS; RADAR; VIMS; G70		IN	18.646	V	-59.6	246.9	75.9	T80
T81	Equatorial - 1	160	S72	01/30/12	030	13:39:48		31130	CIRS; UVIS	ISS; UVIS; CIRS; G70		Out	12.692		-59.7	105.1	96.3	T81
T82	Equatorial - 1	161	S72	02/19/12	050	08:43:17		3803	CIRS; ISS	CIRS; M70		IN	18.343		9.5	61.42	143	T82
T83	Equatorial - 1	166	S73	05/22/12	143	01:10:11	336	953	VIMS; CIRS; RADAR	RADAR; VIMS; CIRS; M70		Out	13.619		72.7	127.7	71.2	T83
T84	Inclined - 2	167	S73	06/06/12	159	00:07:21	318	959	CIRS; VIMS; CIRS; RADAR	UVIS; CIRS; G70		Out	13.636		38.9	282.7	74.6	T84
T85	Inclined - 2	169	S74	07/24/12	206	20:03:07	226	1013	CIRS; VIMS; CIRS	VIMS; CIRS; VIMS; G70		Out	13.69		62.0	149.3	58.3	T85
T86	Inclined - 2	172	S75	09/26/12	270	14:35:38	425.7	956	CIRS; UVIS; CIRS	IN; CIRS; UVIS; CIRS; C70		Out	13.443		62.6	200.6	46.6	T86
T87	Inclined - 2	174	S76	11/13/12	318	10:22:08	123.4	973	Dual PB error; CIRS; VIMS; Safing; VIMS; CIRS; G70			Out	13.224		11.7	124.7	68.2	T87
T88	Inclined - 2	175	S76	11/29/12	334	08:57:59	278.9	1015	CIRS	VIMS; CIRS; C70; CIRS; C70		Out	13.244		25.9	147.9	44.1	T88
T89	Inclined - 2	181	S77	02/17/13	048	01:56:35		1978		RSS; CIRS; M70		Out	13.191		21.1	154.9	34.8	T89
T90	Inclined - 2	185	S78	04/05/13	095	21:43:31		1400	CIRS	VIMS; CIRS; M70		Out	12.869		-16.5	129.7	68.7	T90
T91	Inclined - 2	190	S78	05/23/13	143	17:32:55	318.4	970	CIRS	RADAR; ISS; CIRS; M70		Out	12.859		46.1	239.9	50.3	T91
T92	Inclined - 2	194	S79	07/10/13	191	13:21:47	400.9	964	ISS; CIRS	RADAR; VIMS; ISS; C70		Out	12.906		37.0	234.7	45.6	T92
T93	Inclined - 2	195	S79	07/26/13	207	11:56:22		1399	CIRS; ISS; CIRS; UVIS; ISS	VIMS; ISS; CIRS; VIMS; C70		Out	12.843		28.1	249.2	58	T93
T94	Inclined - 2	197	S80	09/12/13	255	07:43:56		1397	CIRS; ISS	VIMS; CIRS; UVIS; VIMS; C70		Out	12.501		17.3	206.1	21	T94
T95	Inclined - 2	198	S80	10/14/13	287	04:56:27	311	961	CIRS; ISS; CIRS; RADAR	IN; RADAR; CIRS; C70		Out	12.4		8.3	205.3	24.7	T95
T96	Inclined - 2	199	S81	12/01/13	335	00:41:19		1400	CIRS; ISS	VIMS; CIRS; VIMS; C70		IN	12.525		-13.6	143.4	50.4	T96
T97	Inclined - 2	200	S82	01/01/14	001	21:59:41		1400	CIRS; ISS; CIRS; UVIS	VIMS; CIRS; UVIS; CIRS; C70		IN	12.496		-14.1	176.7	35.2	T97
T98	Inclined - 2	201	S82	02/02/14	033	19:12:38	207.8	1236	CIRS; ISS	RADAR; CIRS; C70		IN	12.287		-22.6	176.8	43.9	T98
T99	Inclined - 2	202	S82	03/06/14	065	16:26:47		1500		RSS; C70		IN	12.055		-31.1	176.9	52.6	T99
T100	Inclined - 2	203	S83	04/07/14	097	13:41:14	518	963	CIRS; ISS; CIRS; VIMS	CIR; VI; IN; CIRS; UVIS; CIRS; C70		IN	11.995	V	-36.8	187.7	59.5	T100
T101	Inclined - 2	204	S83	05/17/14	137	16:12:15	580	2994	CIRS; WP; UVIS; WP	RSS; WP; CIRS; C70		Out	23.968	R	-37.3	161.7	158	T101
T102	Inclined - 2	205	S84	06/18/14	169	13:28:25	580	3659	CIRS; ISS; CIRS	RSS; CIRS; ISS; C70		Out	23.766	R	-36.9	178.6	165	T102
T103	Inclined - 2	206	S84	07/20/14	201	10:40:58		5103	CIRS; ISS; CIRS; VIMS	UVIS; CIRS; ISS; C70		Out	23.757	UV	-31.8	178.9	171	T103
T104	Inclined - 2	207	S85	8/21/14	233	08:09:09	302	964	CIRS; ISS; CIRS; VIMS; RADAR	RAD; VIMS; CIRS; ISS; CIRS; C70		Out	23.872		34.5	360	11.9	T104
T105	Inclined - 2	208	S85	9/22/14	265	05:23:19		1400	CIRS; UVIS	VIMS; CIRS; UVIS; CIRS; C70		Out	23.896	U	43.8	0.496	21	T105
T106	Inclined - 2	209	S86	10/24/14	297	02:40:30	223	1013	CIRS; ISS; CIRS; VIMS	RSS; VIMS; CIRS; C70		Out	23.71		37.5	322.3	31.4	T106
T107	Inclined - 2	210	S86	12/10/14	344	22:26:35	119	980	CIRS; ISS; NAV w INMS riding along	VIMS; CIRS; C70		Out	23.355		53.8	57.43	56	T107
T108	Inclined - 2	211	S87	1/11/15	011	19:48:35	265	970	RINGS PIE; CIRS; VIMS	RADAR; CIRS; C70		Out	23.355		69.3	1.681	45.8	T108
T109	Inclined - 2	212	S87	2/12/15	043	17:08:04	188	1200	VIMS; UVIS	VIMS; CIRS; UVIS; CIRS; C70		Out	23.485		78.7	4.17	55	T109
T110	Inclined - 2	213	S88	03/16/15	075	14:29:49		2275	CIRS; VIMS	CIRS; C70		Out	23.516		74.8	94.96	70.5	T110
T111	Equatorial - 2	215	S89	05/07/15	127	22:50:24		2722	CIRS; VIMS	CIRS; M70		IN	6.2349		-0.8	66.96	33.8	T111
T112	Equatorial - 2	218	S89	07/07/15	188	08:09:50		10953	CIRS; ISS	CIRS; VIMS; CIRS; C70		Out	0.9187		0.8	293.9	78.5	T112
T113	Equatorial - 2	222	S91	09/28/15	271	21:37:13	302	1036	CIRS; ISS; CIRS	VI; CIRS; G70		IN	6.7106		-0.8	61.38	41.9	T113
T114	Equatorial - 2	225	S91	11/13/15	317	05:46:34		11920	CIRS; VIMS; CIRS; VIMS; ISS	CIRS; UVIS; VIMS; C70		Out	2.5481		-14.4	122.4	91.8	T114

Illum. Bound: LIT OUTBOUND ILLUMINATION / UNLIT OUTBOUND ILLUMINATION

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RANGE (KM) ------> 290k 200k 140k 81k 81k 140k 200k 290k

Angular Diameter (degrees) 0.5 0.7 1.1 1.8 33-degrees @ 15 mins

Inbound to c/a (hours) -22 … -1 | Outbound from c/a (hours) 1 … 26

Flyby		REV	SEQ	Date	DOY	C/A Time	Hyd gms	Alt	Inbound to c/a (hours)	Outbound from c/a (hours)	Illum.	Bound	Occ	LST Dec-Hr	Dual pb?	C/A LAT (deg)	C/A LON (deg)	Phase @C/A (deg)	Flyby
T115	Inclined - 3	230	S92	01/16/16	016	02:20:52		3817	CIRS, UVIS	CIRS, VIMS, C70		Out		2.6677		-8.4	300.5	99.4	T115
T116		231	S92	02/01/16	032	01:01:25		1400	CIRS	UVIS, ISS, CIRS, C70		Out	UV	2.6346		-83.9	174	120	T116
T117		232	S93	02/16/16	047	23:52:03	412	1018	CIRS, VIMS	RSS, CIRS, C70		Out	R	2.5869		-38.8	285	122	T117
T118		234	S93	04/04/16	095	19:47:59	143	990	CIRS, UVIS, ISS	UVIS, CIR, UVIS, VIMS, G70		Out	UV	2.2434		-63.3	245.7	138	T118
T119		235	S94	05/06/16	127	17:00:45	415	971	CIRS, ISS, CIRS, CIRS, CAPS	RSS, VIMS, CIRS, C70		Out	R	2.0804		-60.2	177.9	138	T119
T120		236	S94	06/07/16	159	14:12:37	524	975	CIRS	RADAR, CIRS, G70		Out		2.183		-36.8	146.3	124	T120
T121		238	S95	07/25/16	207	10:04:39	391	976	CIRS, VIM	RADAR, VIMS, CIRS, C70		Out	V	2.2366		-7.1	129.1	101	T121
T122		239	S95	08/10/16	223	08:37:30		1599		RSS, ISS, C70		Out		2.1524		9.2	126.1	91.9	T122
T123		243	S96	09/27/16	271	04:23:17		1737	CIRS, VIMS, UVIS, VIMS	CIRS, UVIS, VIMS, G70		Out	UV	1.7553		20.9	126.1	88.1	T123
T124		248	S96	11/14/16	319	00:02:00	459	1582	CIRS, ISS, CIRS, VIMS	RSS, CIRS, ISS, CIRS, C70		Out		1.7248		36.1	122.2	79.7	T124
T125		250	S97	11/29/16	334	22:20:36		3223	VIMS, ISS	VI, CIRS, G70		Out		1.8142		41.3	128	82	T125
T126	Flyby	270	S99	04/22/17	112	06:20:03	409	979	D/L unknown, CIRS, ISS, CIRS, ISS	RADAR, VIMS, CIRS, D/L unknown		Out		1.3232		66.5	95.12	61.5	T126

Predicted Avg Hydrazine use all XXM (g): 332 **Predict**

Average Hydrazine use to date (g) : 285 **As-flown**

Engine day; Caboose day; Instrument 10 Pointer; Data lost

Please direct questions or comments regarding this Summary to **Jo Pitesky (x3-7747)**

Stellar & Solar — UV; Earth — R; INMS — I; Solar — UV; +MAG — I+M; Stellar — U; Hi-Res

Flank In; Tail; Flank Out; Nose

RSS LGA opportunities - T105, T110, T111, T115, T116, T123