

CNES INPUTS TO IOAG CROSS-SUPPORT MISSION MODEL

No.	Mission		Cross-Support Requirements									Ability to Support				Updated	Updated by
	Name	User Agency	Provider Agency	Supporting Communication assets	U/L Freq	D/L Freq	Required Cross Support Services (2)	Start	End	Type (1)	Maturity (3)	Tech	Sched	Comments / Reasons / Remarks			
1	Pleiades-1A	CNES	ESA, CSA	Perth, Saskatoon, St Hubert	2025 - 2110	2200-2290	SL, SLE	16-Dec-2011	31-Jan-2012	L	Completed	Yes	Yes	USN, SSC are involved, others depend on launch trajectory!	2-Dec-2012	Soula	
2	Galileo IOV-2	CNES	ESA	KRU	2025 - 2110	2200-2290	SL, SLE	12-Oct-2012	1-Dec-2012	L	Completed	Yes	Yes	Network coordination by CNES ; SSC, USN are involved	28-Apr-2013	Soula	
3	Pleiades-1B	CNES	ESA, CSA	Perth, Saskatoon, St Hubert	2025 - 2110	2200-2290	SL, SLE	2-Dec-2012	15-Jan-2013	L	Completed	Yes	Yes	USN, SSC are involved, others depend on launch trajectory!	28-Apr-2013	Soula	
4	Galileo IOC-x	CNES	ESA	KRU	2025 - 2110	2200-2290	SL, SLE	1-Jun-2014	31-Dec-2016	L	Planned	Yes	Yes	5 launches ; Network coordination by CNES ;SSC and USN are involved	5-May-2015	Soula	
5	JASON-3	CNES	NASA	GN: AGS, WGS	2025 - 2110	2200-2290	SL, SLE	1-Jul-2015	1-Feb-2016	L	Potential	Yes	Yes	LEOP and Emergency under CNES control (TBC with NASA)	5-May-2015	Soula	
6	CSO-1	CNES	ESA CSA	Perth, Saskatoon, St Hubert	2025 - 2110	2200-2290	SL, SLE	Q2, 2018	Q4, 2018	L	Potential	Yes	Yes	USN, SSC are involved, others depend on launch trajectory!	5-May-2015	Soula	
7	CSO-2	CNES	ESA CSA	Perth, Saskatoon, St Hubert	2026 - 2110	2200-2290	SL, SLE	Q1, 2019	Q3, 2019	L	Potential	Yes	Yes	USN, SSC are involved, others depend on launch trajectory!	5-May-2015	Soula	
8	MERLIN	CNES	DLR	TBD	2026 - 2110	2200-2290 8025-8400	SL, SLE	Q4, 2019	Q4, 2024	L, E	Potential	Yes	No	Cooperative program under a MOU ; LEOP and routine under definition	5-May-2015	Soula	
9	SWOT	CNES	NASA	NEN: AGS, WGS	2025 - 2110	2200-2290 8025-8400	SL, SLE	Q4, 2020	Q3, 2024	L, E	Potential	Yes	No	Cooperative program under a MOU ; LEOP and routine under definition	5-May-2015	Soula	
10	CSO-3	CNES	ESA CSA	Perth, Saskatoon, St Hubert	2025 - 2110	2200-2290	SL, SLE	Q3, 2020	Q1, 2021	L	Potential	Yes	No	USN, SSC are involved, others depend on launch trajectory!	2-Dec-2012	Soula	
11	Chang'e-2	CNSA	TBD					end 2011		M	Potential						
12	Chang'e-3	CNSA	TBD							M	Potential						
13	Yinghuo-1	CNSA	ESA	CEB, NNO, KRU, MSP, PER	7145 - 7190	8400 - 8450	SLE	1-Apr-2010	21-Aug-2011	Ma	Agreed	Yes	Yes		19-Mar-2009	KJS	
14	Venus Express	CNSA	ESA	CEB, NNO, KRU, MSP, PER	7145 - 7190	8400 - 8450	SLE	1-Apr-2010	21-Aug-2011	Ma	Agreed	Yes	Yes		19-Mar-2009	KJS	
15	GRACE 1 / GRACE 2	DLR/NASA	NASA				TDM	1Q,2001	2017	E	Operational	Yes	Yes	Cooperative program	24-Jan-2014	M.Pilgram	
16	EnMAP	DLR	CSA, SSC, KSAT				SL, SLE	2017	2020	E	Potential	Yes	Yes	LEOP only	24-Jan-2014	M.Pilgram	
17	TerraSAR-X	DLR	CSA, KSAT, SSC				SL, SLE	15-Jun-2007	2015	E	Extended	Yes	Yes	Frame Agreement with CSA and K-SAT	24-Jan-2014	M.Pilgram	
18	TanDEM-X	DLR	CSA, KSAT, SSC				SL, SLE	21-Jun-2010	2015	E	Operational	Yes	Yes	Frame Agreement with CSA and K-SAT	24-Jan-2014	M.Pilgram	
19	TET-1	DLR	CSA, KSAT				SL, SLE	22-Jul-2012	2015	E	Operational	Yes	Yes	LEOP only	24-Jan-2014	M.Pilgram	
20	EurCROPIS	DLR	planned: CSA, KSAT				SL, SLE	2016	2018	E	Potential	Yes	Yes	only LEOP support	24-Jan-2014	M.Pilgram	
21	BIROS	DLR	planned: CSA, KSAT				SL, SLE	2015	2017	E	Agreed	Yes	Yes	only LEOP support	24-Jan-2014	M.Pilgram	
22	PAZ	DLR	CSA, KSAT				SL, SLE	2017	2027	E	Potential	Yes	Yes	Frame Agreement with CSA and K-SAT	24-Jan-2014	M.Pilgram	
23	DEOS	DLR	planned: EDRS, KSAT, CSA				SL, SLE	2017	2019	E	Potential	Yes	Yes	Frame Agreement with CSA and K-SAT, EDRS	24-Jan-2014	M.Pilgram	
24	H2SAT	DLR	Intelsat				SL, SLE	2016	2026	G	Potential	Yes	Yes	TTC Frequency still open (S, Ku, KA-Band?)	24-Jan-2014	M.Pilgram	
25	GRACE_FO	DLR/NASA	NASA				SL, SLE	2018	2025	E	Potential	Yes	Yes	Cooperative program	24-Jan-2014	M.Pilgram	
26	EDRS-C	DLR	CNES, ISRO, USN				SL, SLE	2016	2026	G	Agreed	Yes	Yes		24-Jan-2014	M.Pilgram	
27	HAG-1	DLR	Intelsat				SL, SLE	2014	2014	G	Potential	Yes	Yes	LEOP only	24-Jan-2014	M.Pilgram	
28	ARTEMIS	TBD	ESA/Avanti	Fucino	2025 - 2110	2200 - 2290	TDM	2001-07-12	2014-12-31	G	Operational	Yes	Yes	Support provided	2015-04-29	SBP	
29	SOHO	ESA	NASA	DSN: 26 / 34	2025 - 2210	2200 - 2290	SL	1995-12-02	2016-12-31	L1	Operational	Yes	Yes		2015-04-29	SBP	
30	XMM-Newton	ESA	NASA	DSN 70 GDS			SLE	1999-12-10	2016-12-31	H	Operational	Yes	Yes	eclipse operations support	2015-04-29	SBP	
31	Cluster (4-S/C)	ESA	NASA	DSN: 26 / 34 / 70; GDS, CAN	2025 - 2110	2200 - 2290	SLE	2000-07-16	2018-12-31	H	Operational	Yes	Yes		2015-04-29	SBP	
32	INTEGRAL	ESA	NASA	DSN: 34; GDS, CAN	2025 - 2110	2200 - 2290	SLE	2002-10-17	2018-12-31	H	Operational	Yes	Yes	The support has been terminated	2015-04-29	SBP	
33	Mars Express	ESA	NASA	DSN: 34 / 70	7145 - 7190	8400 - 8450	SLE	2003-06-02	2018-12-31	Ma	Operational	Yes	Yes		2015-04-29	SBP	
34	ROSETTA	ESA	NASA	DSN: 34 / 70	2110 - 2120 7145 - 7190	2290 - 2300 8400 - 8450	SLE	2004-03-02	2016-12-30	D	Operational	Yes	Yes		2015-04-29	SBP	
35	GAIA	ESA	NASA		7190 - 7235	8450 - 8500	SLE	2013-12-19	2020-06-30	L2	Agreed			standard support	2015-04-29	SBP	
36	Gaia	ESA	NASA	DSN			SLE	2013-12-19	2020-06-30	L2	Potential			No cross support planned, only support in case of S/C emergency	2015-04-29	SBP	
37	LISA-Pathfinder (LPF)	ESA	CNES, NOAA	HBK, FBK	7190 - 7235	8450 - 8500	SLE	2015-09-30	2018-10-30	L1	Potential			No cross support planned, only support in case of S/C emergency	2015-04-29	SBP	
38	EXOMARS 2016	ESA	ESA	ESTRACK	7145 - 7190	8400 - 8450	SLE	2016-01-07	2022-12-31	Ma	Agreed	Yes	Yes	support in cruise and aerobraking phase, Mars orbit insertion via MoU	2015-04-29	SBP	
39	Bepi Colombo	ESA	NASA	DSN: 34 / 70 GDS	7145 - 7190 34200 - 34700	8400 - 8450, 31800 - 32300	SLE	2017-01-31	2026-07-04	D	Agreed	Yes	Yes	radio science only	2015-04-29	SBP	
40	Bepi Colombo	ESA	JAXA	Usuda	7145 - 7190	8400 - 8450, 31800 - 32300	SLE	2017-01-31	2026-07-04	D	Agreed	Yes	Yes		2015-04-29	SBP	
41	ExoMars 2018	ESA	ESA	ESTRACK	7145-7190	8400-8450	SLE	2018-05-31	2019-10-30	Ma	Potential			ESA Mars Rover - baseline relay service by Exomars 2016. Potential relay services by TBD NASA Orbiter	2015-04-29	SBP	
42	Solar Orbiter	ESA	NASA	DSN: 34 / 70	7190 - 7235	8450 - 8500	SLE	2018-10-31	2025-11-15	L1	Potential				2015-04-29	SBP	
43	Euclid	ESA	NASA	DSN			SLE	2020-01-31	2026-07-30	L2	Potential			No cross support planned, only support in case of S/C emergency	2015-04-29	SBP	
44	Chandrayaan-1	ISRO/DLR	APL / NASA	APL / DSN 34	2025 - 2110	2200 - 2290	SLE	9-Apr-2008	16-Apr-2010	M	Agreed	Yes	Yes	Mission Support	22-May-2007	EL	

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45	MEGHA TROPIQUES	ISRO	CNES	KRU, HBK		2200 - 2290	SL	Q2, 2010	Q4, 2010	E	Agreed	Yes	Yes	Cross support in mission phase	6-Mar-2009	J-MS
46	Geotail	JAXA	NASA	DSN: 26	2025 - 2110	2200 - 2290	SLE	24-Jul-92	End of 2015	H	Operational	Yes	Yes		4-Dec-2012	T.S.
47	SOLAR-B	JAXA	many	Wallops, Alaska, Svalbard, Sanchago, Troll, MacMard, Banglor	2025 - 2110	2200 - 2290	TDM	22-Sep-06	TBD	E	Operational	Yes	Yes		4-Dec-2012	T.S.
48	HAYABUSA-2	JAXA	NASA	DSN	7200	8400-32000	SLE	2014	12-Jul-05	D	Agreed				8-May-2013	T.S.
49	BepiColombo-MMO	JAXA	ESA	Cebreros	7158	8410	SLE	2016	TBD	D	Agreed				1-Feb-2014	T.S.
50	SELENE-2	JAXA	TBD	TBD	TBD	TBD	TBD	2017	TBD	M	Potential				4-Dec-2012	JAXA
51	KOMPSAT-1	KARI	DLR, NASA	Weilheim, Poker Flat, Svalbard, Wallops, Mcmurdo	2025-2110	2200-2290	SL/TDM	4Q1999	4Q2002	E	Completed			LEOP/Emergency Support	8-May-2013	S. I. AHN
52	KOMPSAT-2	KARI	KSAT, ESA	Svalbard, Malindi, Maspalomas	2025-2110	2200-2290	SL	3Q2006	3Q2015	E	Operational			LEOP/Normal Support	27-Jan-2014	S. I. AHN
53	KOMPSAT-3	KARI	KSAT	Svalbard, Troll	2025-2110	2200-2290	SL	2Q2012	2Q2016	E	Operational			Frame Agreement, LEOP/Emergency Support	8-May-2013	S. I. AHN
54	KOMPSAT-3A	KARI	KSAT	Svalbard, Troll	2025-2110	2200-2290	SL	1Q2015	1Q2019	E	Operational			Frame Agreement, LEOP/Emergency Support	21-May-2015	S. I. AHN
55	KOMPSAT-5	KARI	KSAT	Svalbard, Troll	2025-2110	2200-2290	SL	3Q2013	3Q2018	E	Operational			Frame Agreement, LEOP/Emergency Support	27-Jan-2014	S. I. AHN
56	STSAT-3	KARI	KSAT	Svalbard	2025-2110	2200-2290	SL	4Q2013	4Q2013	E	Operational			Frame Agreement, LEOP Support Only	27-Jan-2014	S. I. AHN
57	KOMPSAT-6	KARI	KSAT	Svalbard, Troll	2025-2110	2200-2290	SL	2019	TBD	L	Potential			Frame Agreement, LEOP/Emergency Support	8-May-2013	S. I. AHN
58	CASSIOPEE-1	KARI	TBD	TBD	2025-2110	2200-2290	SL	TBD	TBD	L	Potential			Frame Agreement, LEOP Support Only	21-May-2015	S. I. AHN
59	Areostationary Relay-A	NASA	TBD		X, Ka 40 GHz or Optical	X, Ka 37 GHz, or Optical		-2031	-2041	L, Ma	Potential				2015-03-19	M. Schaub
60	Areostationary Relay-B	NASA	TBD		X, Ka 40 GHz or Optical	X, Ka 37 GHz, or Optical		-2033	-2043	L, Ma	Potential				2015-03-19	M. Schaub
61	Asteroid Redirect Mission	NASA	TBD		X	X, Ka 32 GHz		TBD	TBD	L, D	Potential				2015-03-19	M. Schaub
62	Cassini	NASA	ESA	ESA	S or X or Ka	S or X or Ka	Gravity Science	1997-10-15	2017-09-15	D	Agreed				2015-03-19	M. Schaub
63	EM-1	NASA	JAXA		S	S	3-Way Doppler	2018-07-18	TBD	M, D	Potential			Note that the launch date could be slightly later. The DSA specifies a September 2018 launch date, and SLS is committed to launching EM-1 "no later than November 2018."	2015-03-27	D. Abraham
64	EM-2	NASA	JAXA		S	S	3-Way Doppler	-2022	TBD	M, D	Potential				2015-03-19	M. Schaub
65	Europa Clipper	NASA	TBD		X	X, Ka 32 GHz		TBD	TBD	L, D	Potential				2014-01-24	D. Abraham
66	InSight	NASA	ESA		UHF (proximity), X (DTE)	UHF (proximity), X (DTE)	TT&C, launch telemetry and cruise DDOR services.	2016-03-08	2018-10-26	L, Ma	Agreed			Cross-support is en route. Once on Mars surface, lander is prime at UHF.	2015-03-19	M. Schaub
67	InSight	NASA	JAXA		UHF (proximity), X (DTE)	UHF (proximity), X (DTE)	DDOR services	2016-03-08	2018-10-26	Ma	Agreed			Cross-support is en route. Once on Mars surface, lander is prime at UHF.	2015-03-19	M. Schaub
68	JWST	NASA	ESA	KRU, MAL, PER	S	S, Ka 26 GHz	TT&C for LEOP	2018-10-15	2018-10-15	L	Agreed			Launch day only. The mission end date is 30-Oct-23.	2014-01-24	D. Abraham
69	LCRD	NASA	ESA		Optical	Optical		TBD	TBD	E	Potential				2015-03-19	M. Schaub
70	Mars 2020 Rover	NASA	TBD		UHF (proximity), X (DTE)	UHF (proximity), X (DTE)		2020-08-01	2023-04-01	L, MaR	Potential			Rover is prime at UHF.	2014-01-24	D. Abraham
71	Mars-24 Placeholder	NASA	TBD		X	X, Ka 32 GHz		-2024	TBD	L, Ma	Potential			Orbiter with relay capability as a "strawman" assumption.	2015-03-19	M. Schaub
72	Mars-28 Placeholder	NASA	TBD		X	X, Ka 32 GHz		-2028	TBD	L, MaR	Potential				2015-03-19	M. Schaub
73	MAVEN	NASA	ESA		X	X	Launch support; backup support for the entire mission	2013-11-18	2015-10-27	Ma	Operational			Launch support; backup support for the entire mission. Spacecraft has UHF relay capability.	2015-03-19	M. Schaub
74	MER-Opportunity	NASA	ESA		UHF (proximity), X (DTE)	UHF (proximity), X (DTE)		2003-07-08	2015-09-30	MaR	Extended			Rover is prime at UHF. Backup Relay via MEX	2015-03-19	M. Schaub
75	MSL Curiosity	NASA	ESA		UHF (proximity), X (DTE)	UHF (proximity), X (DTE)		2011-11-26	2016-09-25	MaR	Operational			Rover is prime at UHF. Backup Relay via MEX	2015-03-19	M. Schaub
76	Ni-SAR	NASA	ISRO		S	S, Ka		-2021	TBD	E	Agreed				2015-03-19	M. Schaub
77	NuSTAR	NASA	ASI	Malindi	S	S		2012-06-13	2017-09-30	E	Operational	Yes	Yes		2014-01-24	M. Schaub
78	OSIRIS-REx	NASA	TBD		X	X		2016-09-04	2023-10-31	L, D	Potential			Asteroid sample return	2014-01-24	D. Abraham
79	STEREO-Ahead	NASA	ESA	ESA	X	X	TT&C, Science, SLE	2006-10-26	2018-09-30	D	Operational				2014-01-24	M. Schaub
80	STEREO-Behind	NASA	ESA	ESA	X	X	TT&C, Science, SLE	2006-10-26	2018-09-30	D	Operational			Note that contact with STEREO B was lost in October 2014. The STEREO Project is currently working to reestablish contact.	2015-03-27	D. Abraham
81	Swift	NASA	ASI	Malindi	S	S	SLE	2004-11-20	2019-10-30	E	Extended	Yes	Yes		2014-01-24	M. Schaub
#REF!	Luna-Glob	RFA	TBD							M	Potential					
#REF!	Luna-Grunt Return Vehicle	RFA	TBD								Potential					
#REF!	Luna-Grunt Rover	RFA	TBD								Potential					
#REF!	Phobos-Grunt	RFA/CNSA	ESA	CEB, NNO, KRU, MSP, PER	7145 - 7190	8400 - 8450	SLE	1-Oct-2009		Ma	Agreed	Yes	Yes		19-Mar-2009	KJS