Planetary Technology Programs for TDOs

Discovery Day

March 25, 2020

Carolyn Mercer, PhD

Manager, Planetary Exploration Science Technology Office

Program Executive, Small Innovative Missions for Planetary Exploration (SIMPLEx)

Planetary Science Technology Development Programs

>170 active tasks

Science Instruments		Instruments and Vehicle Technology	Space Vehicle Technology
MatISSE	TRL 3-6	NASA Provided Lunar Payloads – To TRL 6 by 2020	HOTTech – High temperature systems
DALI	TRL 3-6 (Lunar)	Lunar Surface Instrument and Technology Payloads – To TRL 6 by 2021	
PICASSO	TRL 1-3		
ICEE-2	To TRL 6 by 2022	COLDTech – Surface and sub-surface measurements	SESAME – Ice penetration systems

PIs for MatISSE, DALI, PICASSO, and HOTTech, and COLDTech were informed of the Discovery TDO opportunity. Information about these tasks can be found at the PESTO website:

https://www1.grc.nasa.gov/space/PESTO

SMD Rideshare Policy

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SMD Secondary Payloads Rideshare Policy Document SPD-32
October 4, 2019

II. POLICY

a) It is SMD policy to enable rideshare or launch accommodation opportunities using an ESPA ring as part of the launch service procured for an SMD primary payload.

b) SMD will determine the potential for excess capacity, as identified by Launch Services Program (LSP), after selection of the primary payload (once launch requirements are known). If excess capacity is identified, SMD will utilize the identified excess capacity on SMD primary payload missions using an ESPA ring, for the launch of SMD-sponsored secondary payloads, either competed or directed, that meet science, technology, and exploration goals.

c) SMD may solicit science, technology, and exploration investigations as secondary payloads from the private sector, including commercial and non-profit entities and educational institutions through broad agency announcements.

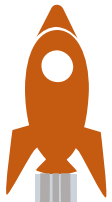
d) SMD may offer any excess capacity not utilized for SMD investigations to other NASA Mission Directorates (MD), other U.S. Government Agencies, or NASA's International partners in accordance with international agreements for international collaborative efforts relating to science, technology, and exploration goals.

NOTIONAL MILESTONES FOR SECONDARY PAYLOAD INTEGRATION

SPs: SECONDARY PAYLOADS
SPA: SECONDARY PAYLOAD ADAPTER
CLA: COUPLED LOADS ANALYSIS
FDLC: FINAL DESIGN LOADS CYCLE
FEM: FINITE ELEMENT MODEL

FPB: FLIGHT PLANNING BOARD
LSIRD: LAUNCH SERVICE IRD
LSTO: LAUCH SERVICE TASK ORDER
PER: PRE-ENVIRONMENTAL TEST REVIEW

★ **Key secondary payload deliverables**



Launch Vehicle Milestones

FPB FOR FINAL LV CONFIGURATION — ***NLT L – 24 (APRIL 2023)***

IF NO SPs BY L-24 MONTHS, THE PRIMARY MISSION GOES TO FPB TO DECIDE EITHER TO REMOVE THE SPA OR KEEP IT (ASSESS IMPACTS: COST, SCHEDULE, TECHNICAL)

LV SELECTION | SELECTED LV EXCESS PERFORMANCE KNOWN — **~L – 33 (~JULY 2022)**

FPB DIRECTION TO LSP — **~L – 40 (~DEC 2021)**

SECONDARY LSIRD'S TO LSP — **~L – 41 (~NOV 2021)**

SPs PRELIMINARY DETAILS TO BE INCLUDED IN THE LAUNCH SERVICE REQUIREMENTS FOR THE LSTO PROCUREMENT PROCESS

PRIMARY MISSION REQUESTS POTENTIAL EXCESS PERFORMANCE FROM LSP — **~SEPTEMBER 2020**

CONTINUE SP SEARCH, IF NEEDED

INITIAL ID OF POTENTIAL SPs

CONTINUAL COMPATIBILITY AND DYN ASSESSMENTS FOR POTENTIAL SPs

Spacecraft Milestones

APRIL 2025 — LRD

◆ SP Mass Simulators ready for contingency

TBD — Primary Mission PER

~7 MONTHS PRIOR TO PER — **SECONDARY FEM'S** required FOR FDLC **(supports Primary PER)** ★

TBD — Primary Mission CDR

~6 MONTHS PRIOR TO CDR — **SECONDARY FEM'S** (If available) FOR PRELIMINARY CLA **(supports Primary CDR)** ★

PRIMARY MISSION COUPLED LOADS IS SCHEDULE DRIVER FOR IDENTIFYING SECONDARY PAYLOAD CONFIGURATION

TBD — Primary Mission KDP-C

TBD — Primary Mission PDR

~June 2020 — Primary Mission SELECTED/DIRECTED