

National Aeronautics and
Space Administration



EXPLORE SCIENCE

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NASA SCIENCE

AN INTEGRATED PROGRAM

Planetary
Science



Earth
Science



Joint Agency
Satellite Division



Astrophysics



Heliophysics



RESEARCH

~**10,000** U.S. Scientists Funded
~**3,000** Competitively Selected Awards
~**\$600M** Awarded Annually

TECHNOLOGY DEVELOPMENT

~**\$500M** Invested Annually

EARTH-BASED INVESTIGATIONS

20 Airborne Missions
8 Global Networks

SPACECRAFT

98 Missions
82 Spacecraft

Science by the NUMBERS

SMALLSATS/ CUBESATS

22 Science Missions
14 Technology Demos

SOUNDING ROCKETS

16 Science Missions
5 Tech/Student Missions

BALLOONS

10 Science Missions
4 Technology/Student

A decorative graphic on the left side of the slide. It features a curved, semi-circular shape containing various celestial bodies: a bright yellow sun, a blue and white Earth, a grey moon, a brown planet, a ringed planet, and a blue nebula. The background is a dark blue space filled with stars.

Overview

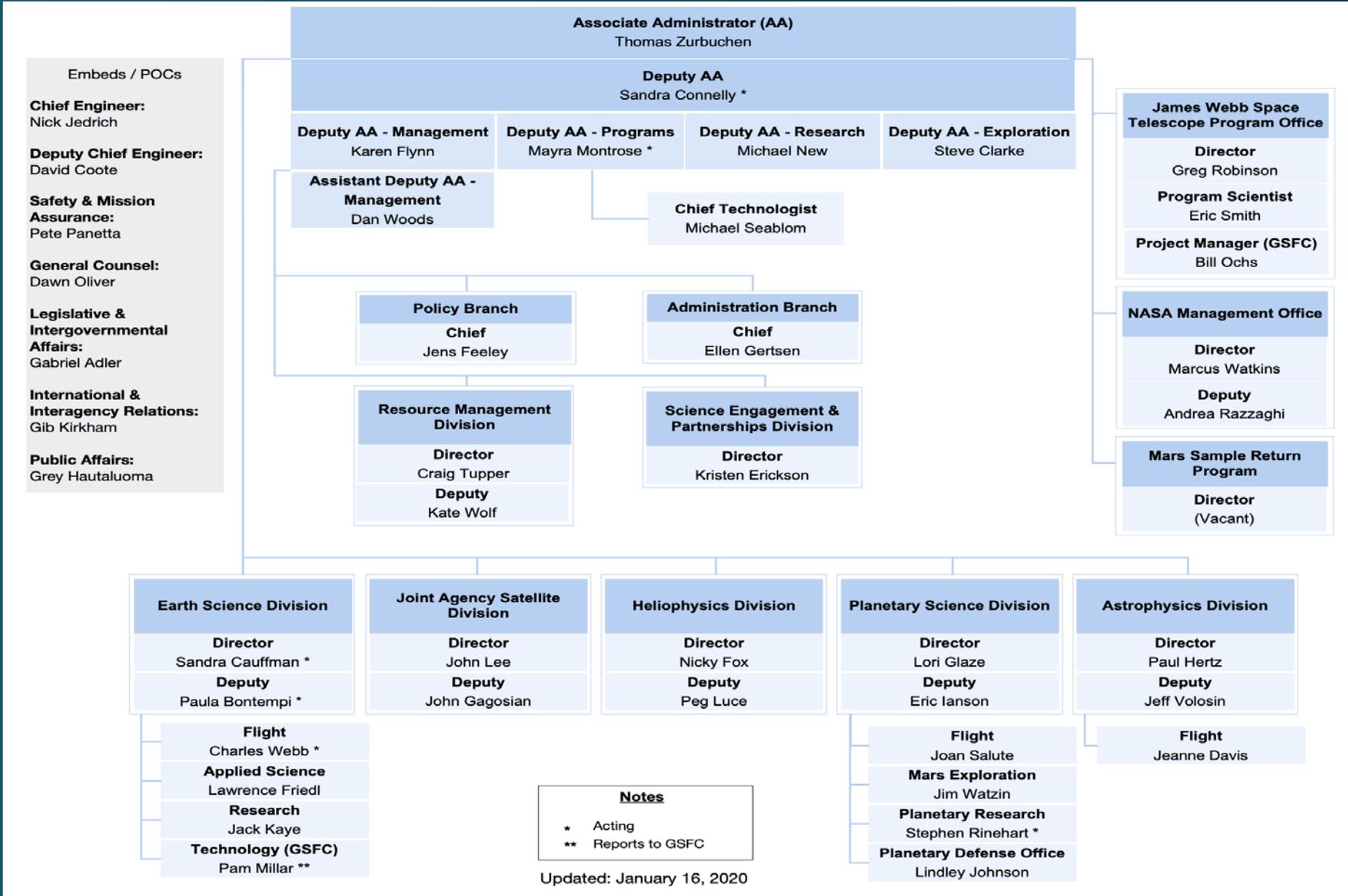
- NASA's science missions are prioritized for NASA development either through
 - The National Academy of Sciences decadal surveys or
 - The evaluation and selection of competitively peer reviewed proposals.
- Small missions tend to be in the latter category.
- NASA issues regular solicitations for small, PI-led mission proposals, and NASA's announcements of opportunity are open to all categories of proposers.

A vibrant space-themed background featuring a large blue and white nebula, a bright yellow sun, and several celestial bodies including a ringed planet, a reddish planet, and a large blue planet. The scene is framed by a white curved line.

SMD Principles

- Substantial progress on NRC decadal surveys in all four science areas is the measure of success
- Investment choices are based on scientific merit via peer review and open competition
- Active participation by the research community beyond NASA is critical to success
- Effective international and interagency partnerships leverage NASA resources and extend the reach of our science results
- A balanced portfolio of space missions and mission-enabling programs sustains progress toward NASA's science goals
- The NASA mandate includes broad public communication
- Accountability, transparent processes, accessible results, and capture of lessons learned are essential features of this Federal science enterprise

Science Mission Directorate Organization



2018 HPD Mission Of Opportunity

NASA Announcement of Opportunity (AO)

Stand Alone Missions Of Opportunity Notice #3
(SALMON-3) NNH17ZDA004O

Program Element Appendix M
(PEA-M):
Heliophysics **Science**
Mission Of Opportunity

SCM
Small Complete Missions

Program Element Appendix L
(PEA-L):
Heliophysics **Technology Demonstration**
Mission Of Opportunity

SCM
Small Complete Missions

Explorers Mission of Opportunity

1. ISS – AETHER/UNH/Clemmons
2. Hosted Payload – JAXA EUVST/NRL/Korendyke
3. SmallSat – EZIE/APL/Yee

PIMMC: \$55M

STP Science MO

1. SIHLA/APL/Paxton
2. GLIDE/U of Ill/Waldrop

PIMMC: \$75M

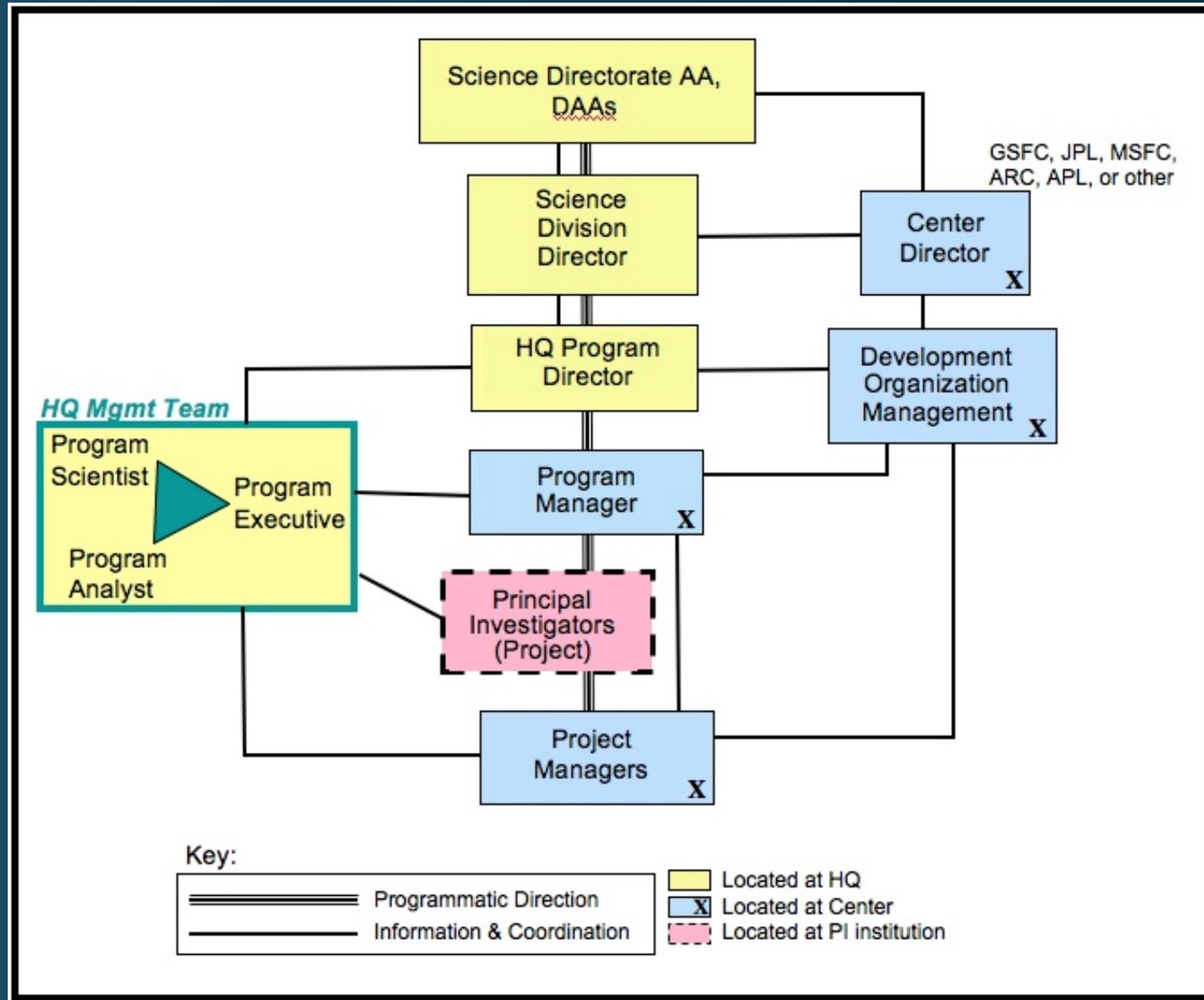
STP TechDemo MO

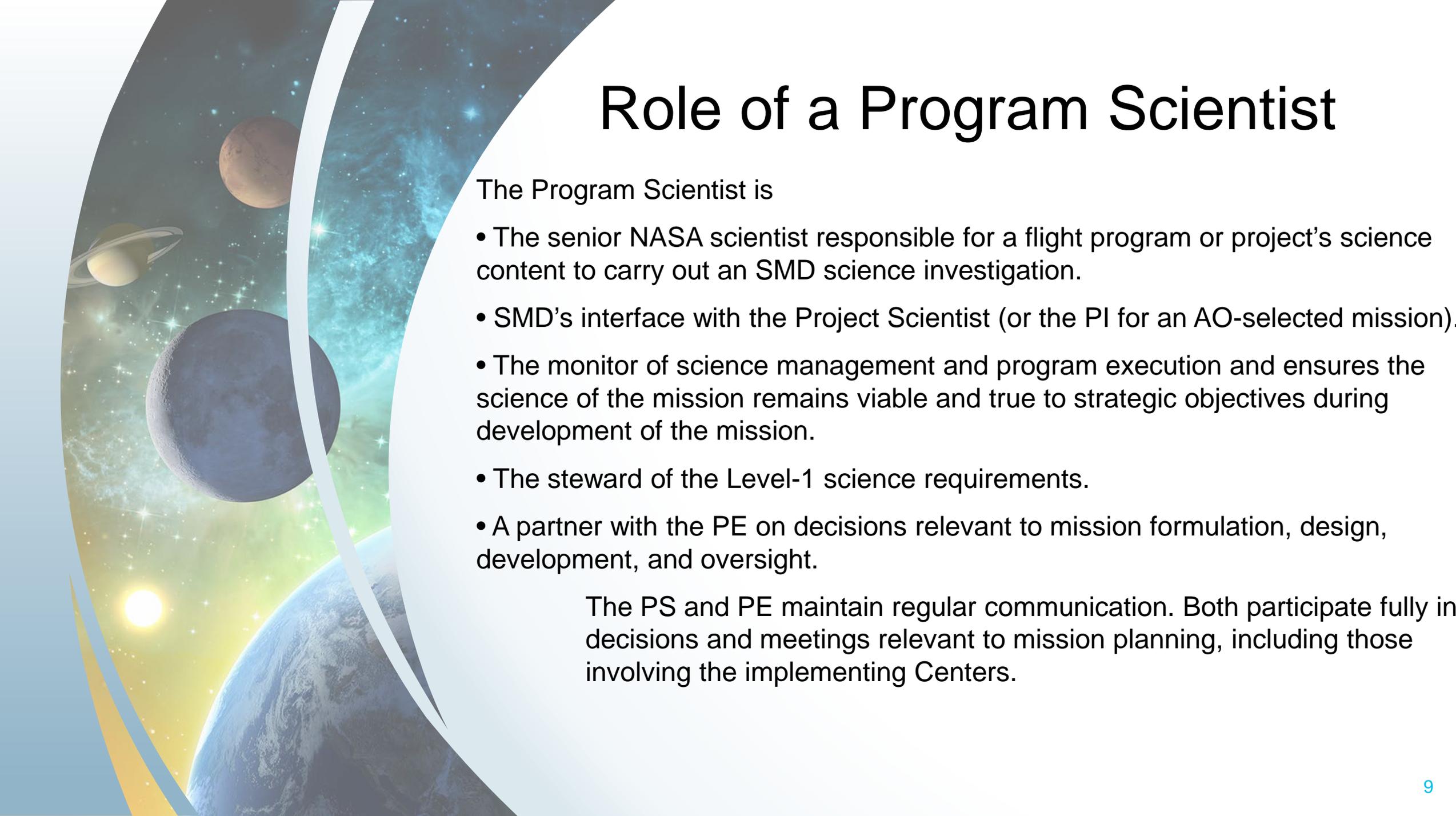
1. SETH/GSFC/Pulkkinen
2. Solar Cruiser/MSFC/Johnson

PIMMC: \$65M

IMAP (STP-5) ESPA RideShare

SMD Management Accountability



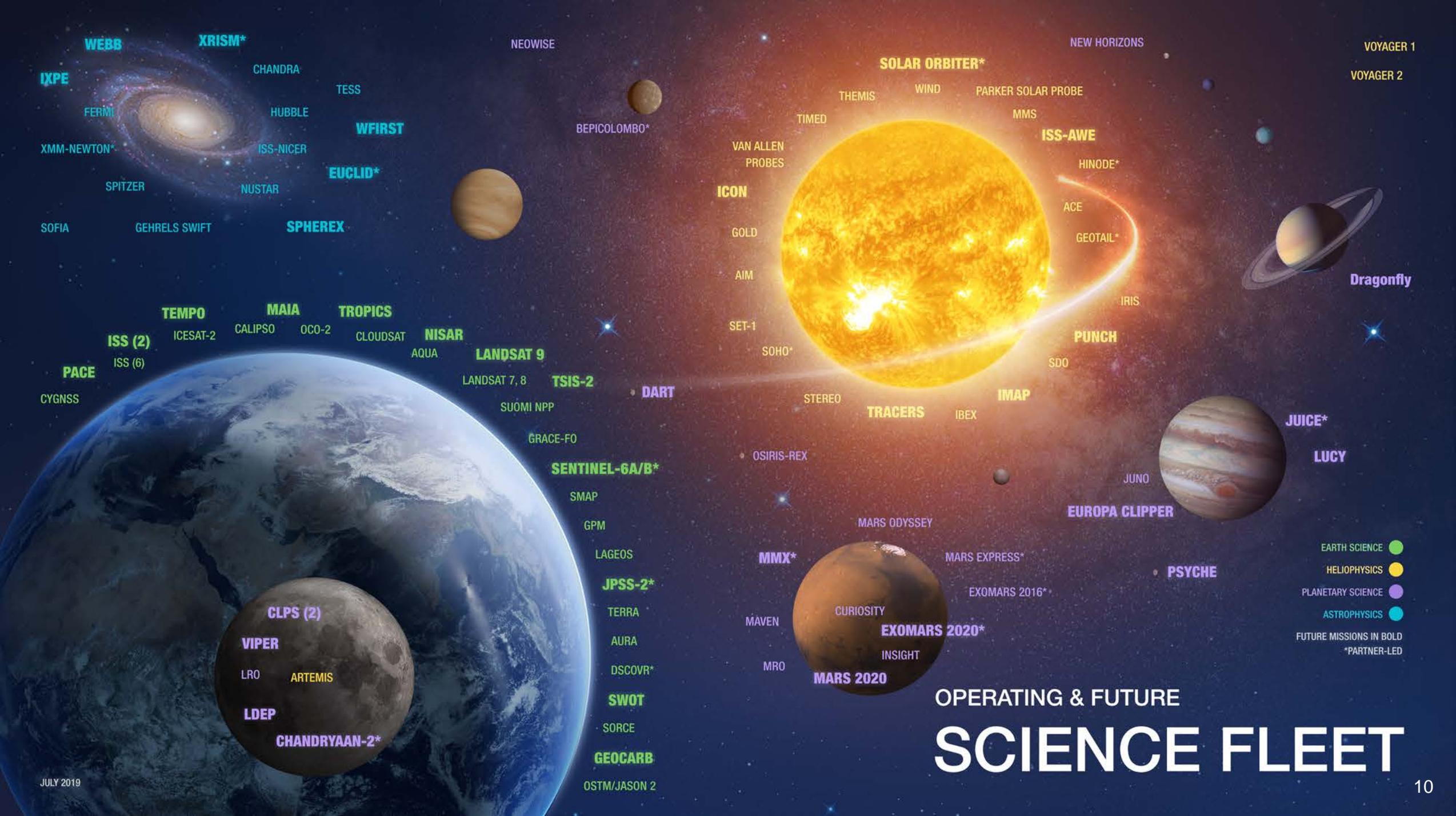
The background of the slide is a vibrant space scene. It features a large, dark blue planet with a prominent ring system (resembling Saturn) in the upper left. Below it is a smaller, reddish-brown planet. In the center, a large, dark blue planet with a textured surface is visible. The bottom of the image shows the curved horizon of Earth, with blue oceans and white clouds. The sky is filled with numerous bright stars and a soft, colorful nebula in shades of blue, green, and yellow. A white, curved line sweeps across the scene from the top left towards the bottom right, separating the title area from the main text.

Role of a Program Scientist

The Program Scientist is

- The senior NASA scientist responsible for a flight program or project's science content to carry out an SMD science investigation.
- SMD's interface with the Project Scientist (or the PI for an AO-selected mission).
- The monitor of science management and program execution and ensures the science of the mission remains viable and true to strategic objectives during development of the mission.
- The steward of the Level-1 science requirements.
- A partner with the PE on decisions relevant to mission formulation, design, development, and oversight.

The PS and PE maintain regular communication. Both participate fully in decisions and meetings relevant to mission planning, including those involving the implementing Centers.



WEBS
IXPE
FERMI
XMM-NEWTON*
SPITZER
SOFIA
CHANDRA
TESS
HUBBLE
ISS-NICER
NUSTAR
WFIRST
EUCLID*
SPHEREX

TEMPO
ISS (2)
ISS (6)
PACE
ICESAT-2
CALIPSO
OCO-2
CLOUDSAT
NISAR
AQUA

CLPS (2)
VIPER
LRO
ARTEMIS
LDEP
CHANDRYAAN-2*

NEOWISE
BEPICOLOMBO*
LANDSAT 9
LANDSAT 7, 8
SUOMI NPP
GRACE-FO
SENTINEL-6A/B*
SMAP
GPM
LAGEOS
JPSS-2*
TERRA
AURA
DSCOVR*

GRACE-FO
SENTINEL-6A/B*
SMAP
GPM
LAGEOS
JPSS-2*
TERRA
AURA
DSCOVR*
SWOT
SORCE
GEOCARB
OSTM/JASON 2

SOLAR ORBITER*
THEMIS
WIND
PARKER SOLAR PROBE
MMS
ISS-AWE
Hinode*
ACE
GEOTAIL*
IRIS
PUNCH
SDO
STEREO
TRACERS
IBEX
IMAP
SOHO*
SET-i
GOLD
AIM
VAN ALLEN PROBES
TIMED

OSIRIS-REX
MARS ODYSSEY
MARS EXPRESS*
EXOMARS 2016*
EXOMARS 2020*
INSIGHT
MARS 2020
MAVEN
MRO
MMX*CURIOUSITY

NEW HORIZONS
VOYAGER 1
VOYAGER 2
Dragonfly
JUNO
EUROPA CLIPPER
PSYCHE
JUICE*
LUCY

EARTH SCIENCE ●
HELIOPHYSICS ●
PLANETARY SCIENCE ●
ASTROPHYSICS ●
FUTURE MISSIONS IN BOLD
*PARTNER-LED

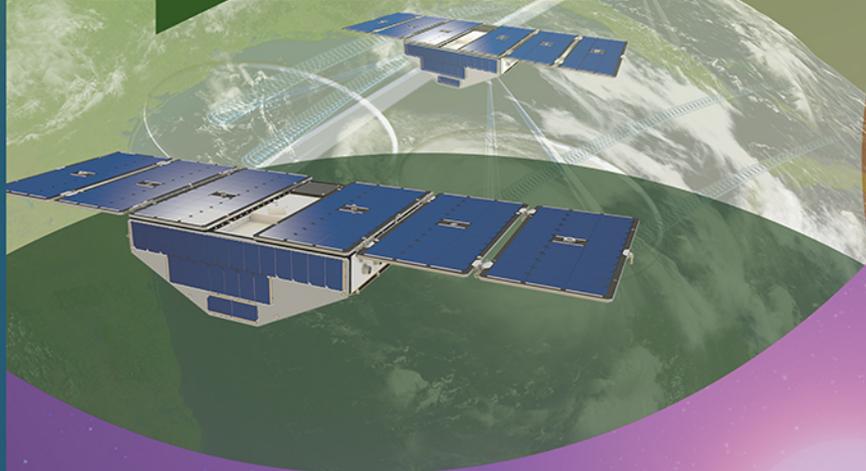
OPERATING & FUTURE SCIENCE FLEET



PROGRAM IMPACT >

TECHNOLOGY >

Disruptive Innovation
SmallSat Constellations



Game Changer
Deep Space Laser Communication



Incremental
Discovering More Exoplanets



Breakthrough Innovation
Unprecedented Ocean Measurements



SMD
ENABLE INNOVATION

Mission Principal Investigator Development

- Seek to increase the diversity of mission principal investigators and develop the next generation of mission leaders to ensure that new ideas and mission concepts are brought forward
- Based on feedback from November 2018 workshop, NASA Science
 - Developed a consolidated PI resources webpage at <https://science.nasa.gov/researchers/new-pi-resources>
 - Introduced a pre-reviews of mission peer review panels to ensure diversity and reduce conflicts of interest
 - Added a code of conduct requirement for SMD-funded conferences to ROSES 2019
 - Restarted proposal writing workshops at major science conferences
 - Included career development positions and associated evaluation criteria as part Discovery and New Frontiers AOs
 - Lessons learned presentation on characteristics and key mistakes associated with proposal success
 - Video: <https://www.youtube.com/watch?v=xoLYRjm48-U>
- Upcoming activities include:
 - Information sessions at science conferences and stand-alone workshops to support people developing first proposal
 - First workshop will be held October 16-18, 2019 in Tucson, AZ and information on how to register will be forthcoming
 - Sign up to learn more at <https://lists.hq.nasa.gov/mailman/listinfo/hq-smdpi-workshop-outreach>



EXPLORE
with us