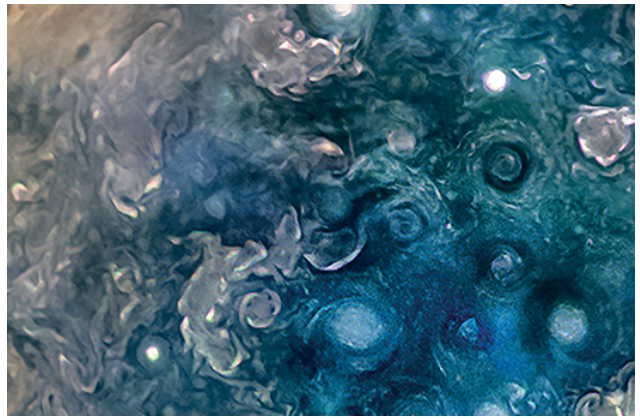
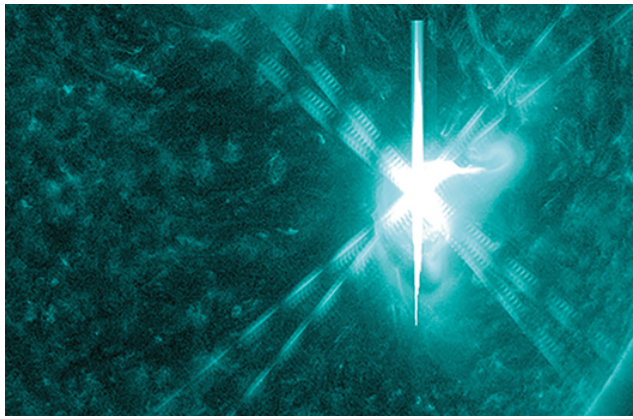
SCIENCE

National Aeronautics and Space Administration



NASA SCIENCE MISSION DIRECTORATE

Opportunities for Engagement

Ellen Gertsen, Executive Officer
Kartik Sheth, Program Scientist
Florence Tan, Deputy Chief Technologist

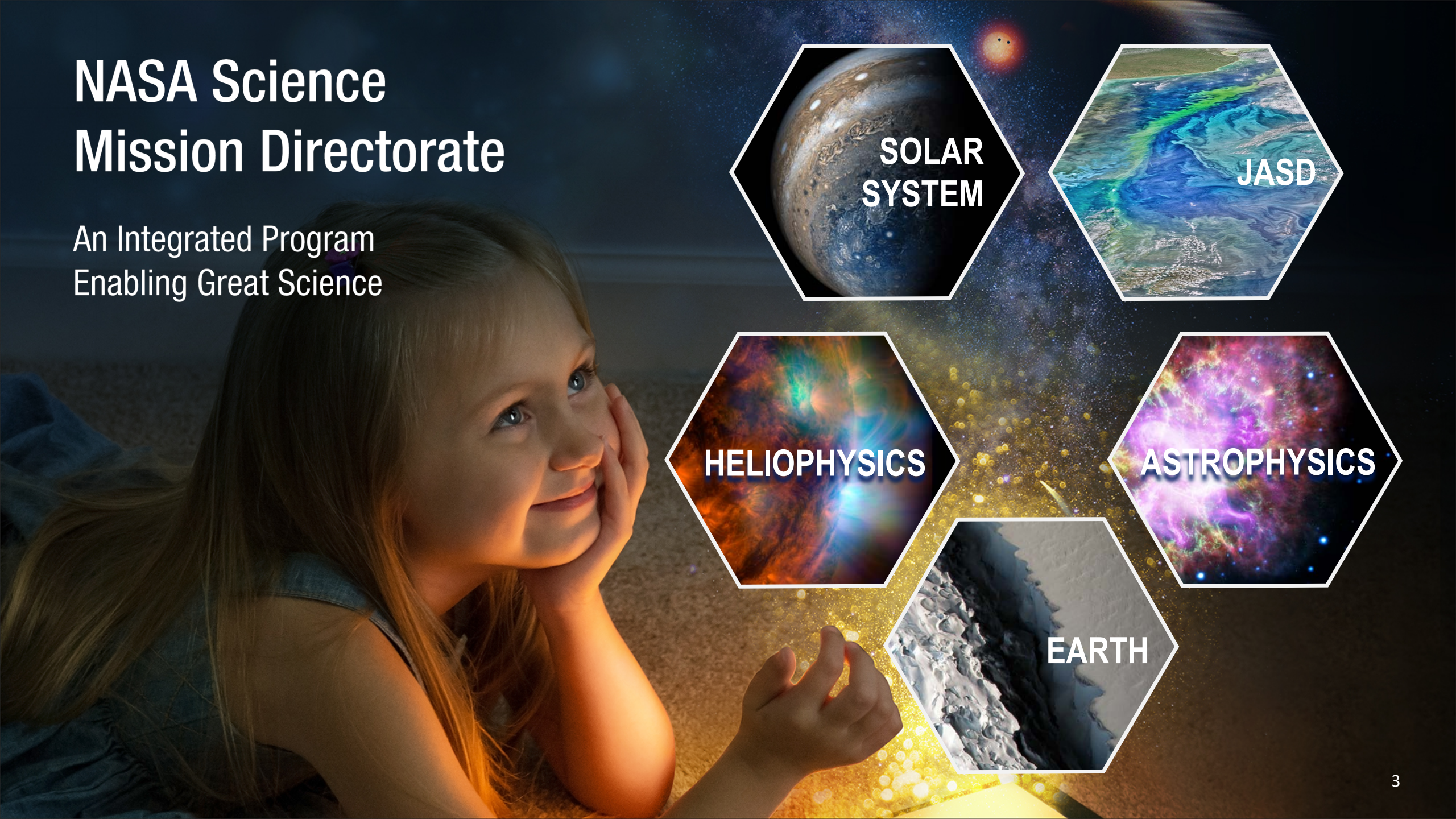
August 14, 2018

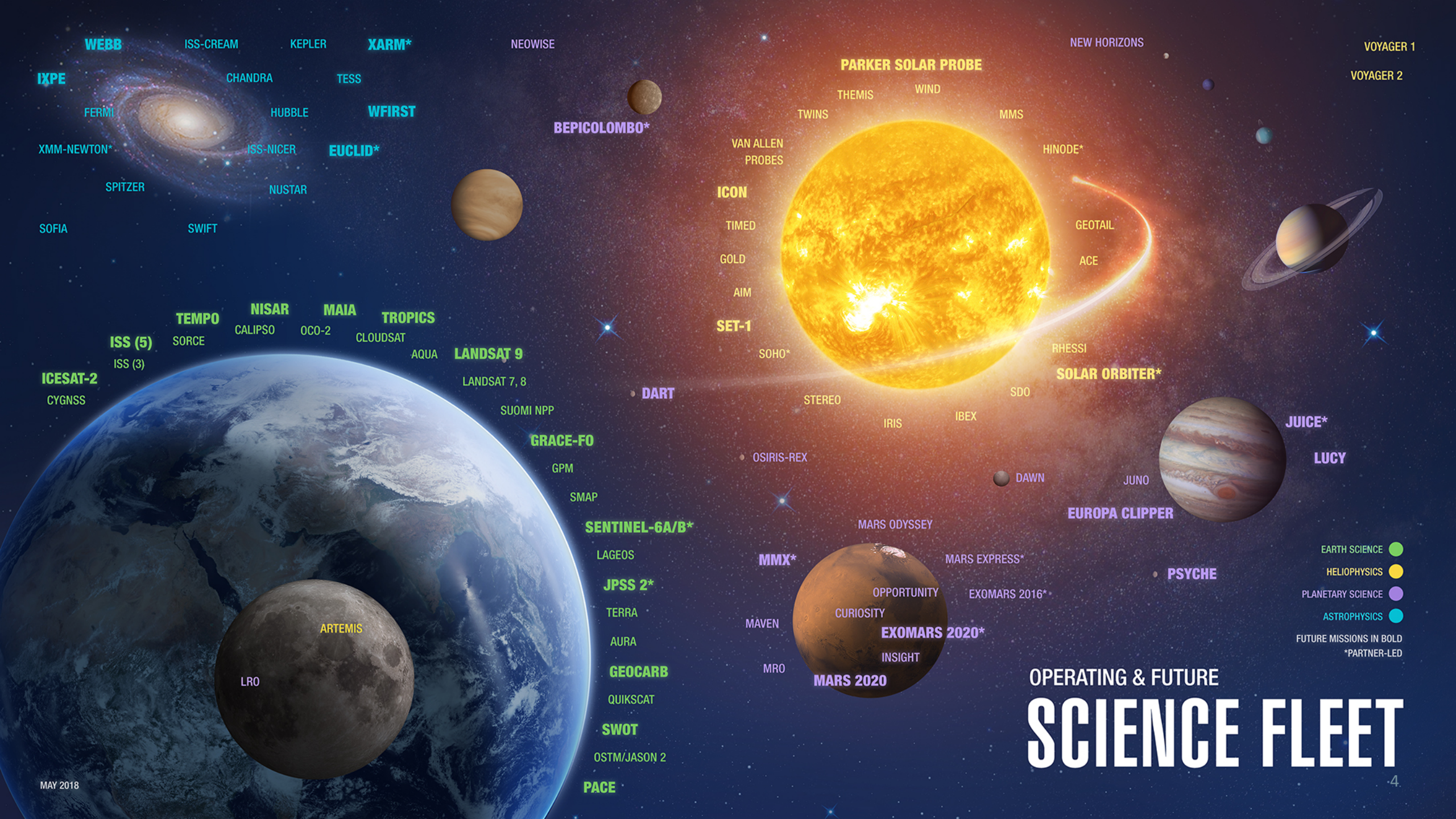
Focus Areas

- NASA Science Overview
- Enabling New Science
- Fostering Innovation
- Cultivating Mission Success

NASA Science Mission Directorate

An Integrated Program
Enabling Great Science





OPERATING & FUTURE

SCIENCE FLEET

Science by the NUMBERS

TECHNOLOGY INNOVATION

~$400M Invested Annually

RESEARCH

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

SPACECRAFT

106 Missions
88 Spacecraft

CUBESATS

22 Science Missions
15 Technology Demos

SOUNDING ROCKETS

16 Science Missions
3 Tech/Student Missions

EARTH-BASED INVESTIGATIONS

25 Major Airborne Missions
8 Global Networks

BALLOONS

13 Science Payloads
1 HASP with up to
12 student experiments

Current as of May 1, 2018

Key Science THEMES

Protect & Improve Life on Earth

Discover Secrets of the Universe

Search for Life Elsewhere

Focus Areas

- NASA Science Overview
- Enabling New Science
- Fostering Innovation
- Cultivating Mission Success

What is ROSES?

- It is the name for an omnibus NASA Research Announcement (NRA)
- Always released on Valentine's Day, February 14
- Basic and Applied Research in support of NASA's Science Mission Directorate (SMD)
- Contains many individual program elements, each with its own due date and topics

How to Read ROSES

- Appendix A: Earth Science Research Program
- Appendix B: Heliophysics Research Program
- Appendix C: Planetary Science Research Program
- Appendix D: Astrophysics Research Program
- Appendix E: Cross-Divisional Research Program

D.14

NSPIRES NASA Solicitation and Proposal Integrated Review and Evaluation System

NASA Research Announcement

SOFIA Next Generation Instrumentation

Solicitation: NNH18ZDA001N-SOFIA

Dates

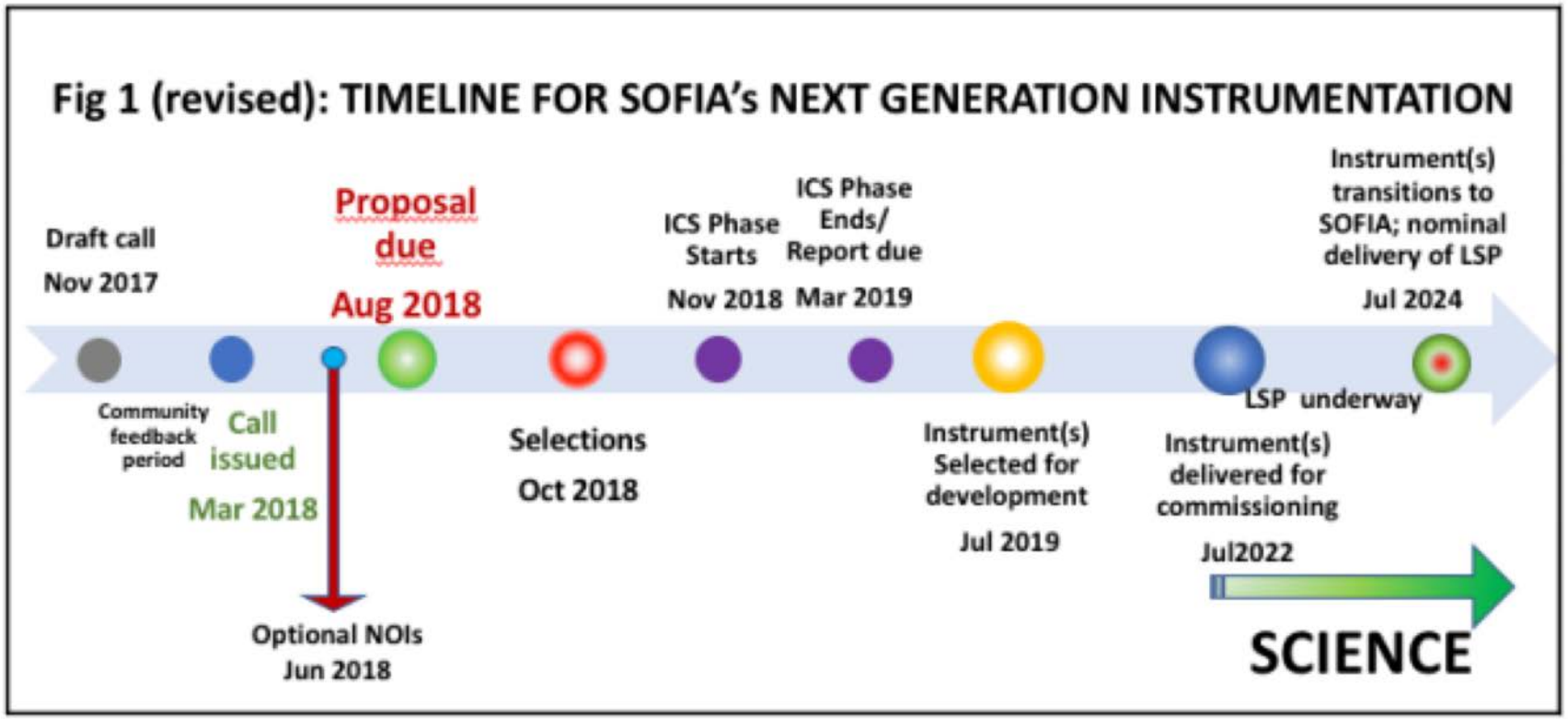
Release	Feb 14, 2018
Close	Aug 01, 2018

Announcement Documents

- DUE DATES: Table 2 lists all program elements in due date order (.HTML)
- DUE DATES: Table 3 lists all program elements in appendix order (.HTML)
- ROSES 2018 Summary of Solicitation (.PDF)
- Complete ROSES 2018 NRA as amended and clarified (.PDF)
- D.1 Astrophysics Research Program Overview (.PDF)
- D.14 SOFIA Next Generation Instrumentation as amended (.PDF)

D.14 Program Information

- **Expected total program budget**: $15 – 20M over three years (higher values need adequate justification
- **Number of new awards:** One or more proposals selected to conduct ICS
- **Maximum duration of awards**: ICS phase to be approximately 5 months; the schedule for implementation and delivery of the selected instrument will be determined during the ICS
- **Dates for Pre-proposal Workshops**: Tuesday, April 3, 2018 at 2pm ET; Monday, April 16, 2018 at 4pm ET; Thursday, May 17, 2018 at 2pm ET



Focus Areas

- NASA Science Overview
- Enabling New Science
- Fostering Innovation
- Cultivating Mission Success

PROGRAM IMPACT >

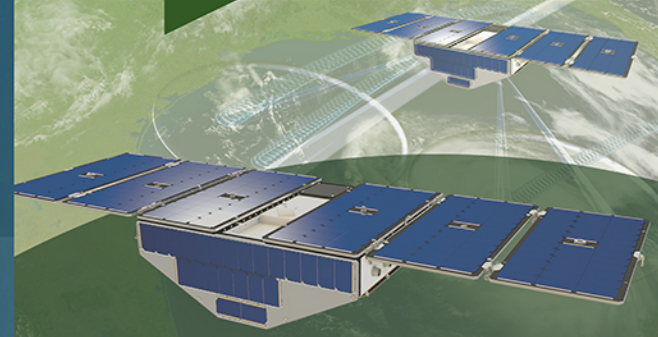
TECHNOLOGY >

SMD

ENABLE INNOVATION

Disruptive Innovation

SmallSat Constellations

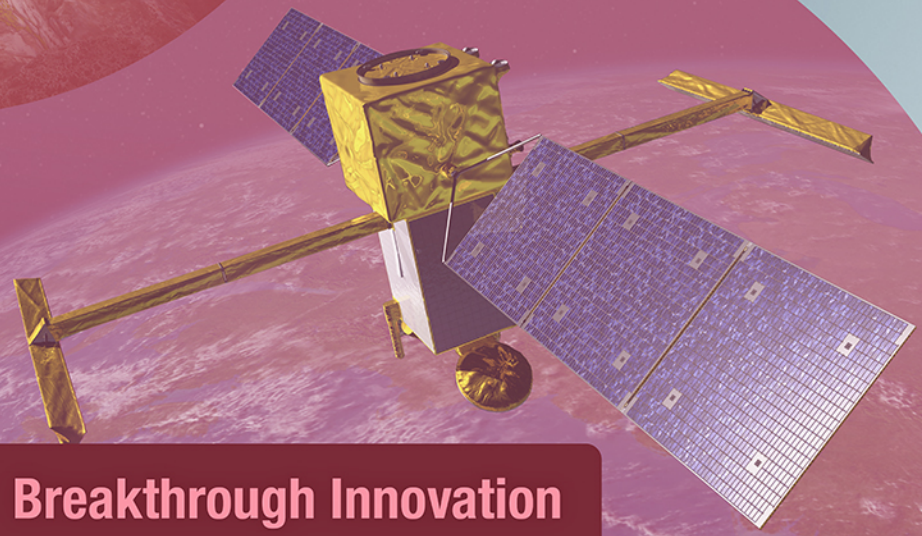


Game Changer

Deep Space Laser Communication

Incremental

Discovering More Exoplanets



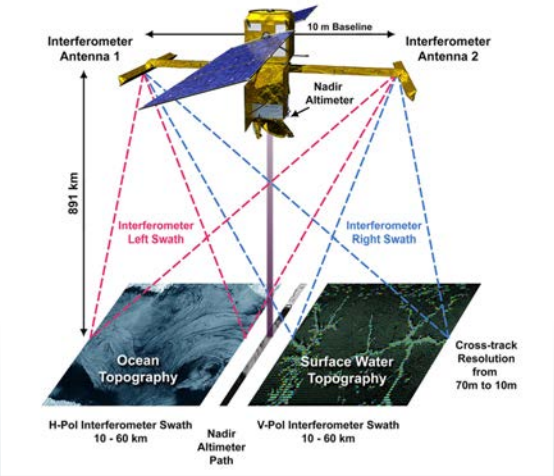
Breakthrough Innovation

Unprecedented Ocean Measurements

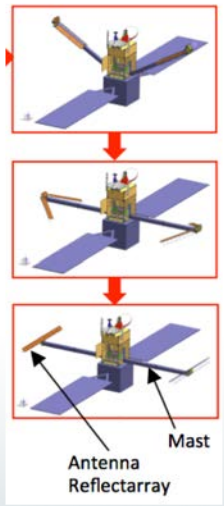
Example of "Breakthrough" Innovation

Surface Water and Ocean Topography (SWOT) Mission

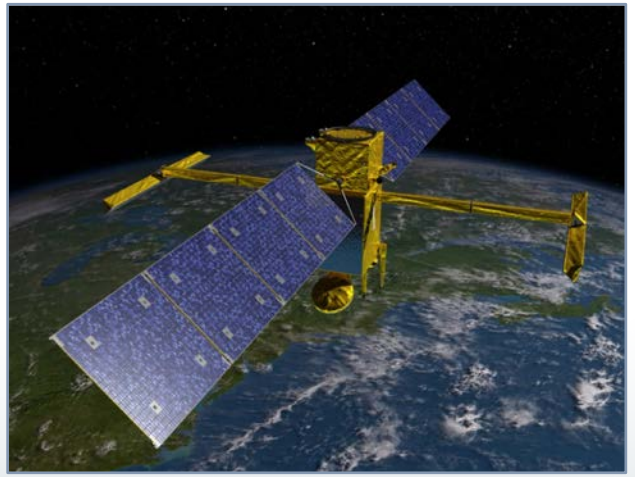
KA-BAND INTERFEROMETER



ANTENNA MAST



SWOT

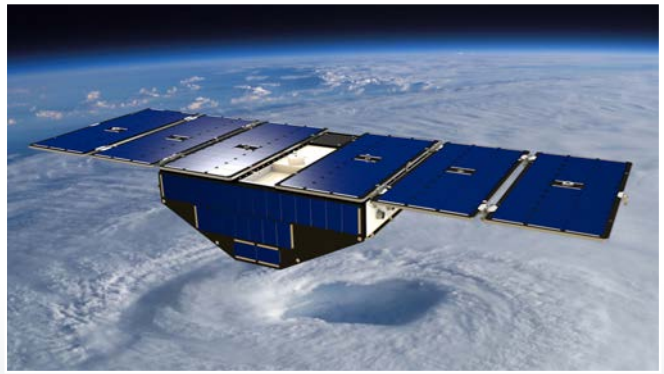
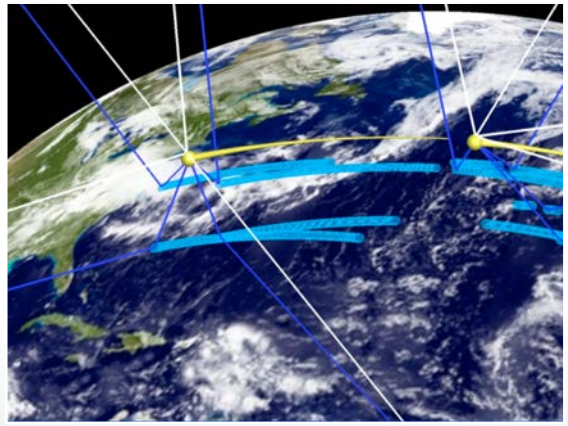


Enabling Technology: *Investments in Ka-band interferometer and precision antenna mast*

Result: *Unprecedented swath measurements of terrestrial water heights and sea surface heights (SWOT to launch in 2020)*

Example of “Disruptive” Innovation

Cyclone Global Navigation Satellite System (CYGNSS)

DELAY MAPPING RECEIVER	CYGNSS	FREQUENT & ACCURATE MEASUREMENTS
		

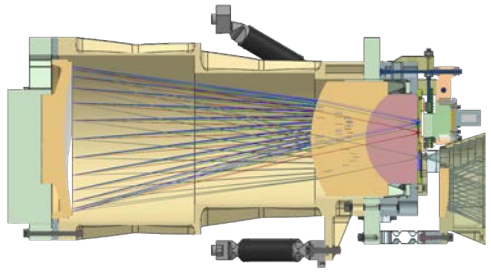
Enabling Technology: *Existing technology (delay mapping receiver) deployed in an unique constellation of 8 LEO spacecraft*

Result: *Frequent and accurate measurement of ocean surface winds will improve tropical cyclone forecasting*

Example of “Game Changing” Innovation

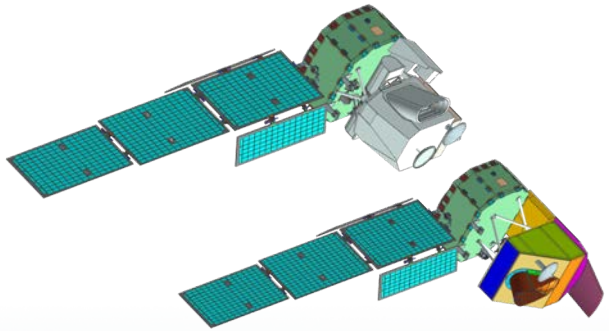
HIGH MASS (700KG)
HIGH POWER (700W)

NEW SPECTROMETER



Enables a lower-cost, small satellite constellation mission

LOW MASS (155KG)
HIGH POWER (380W)



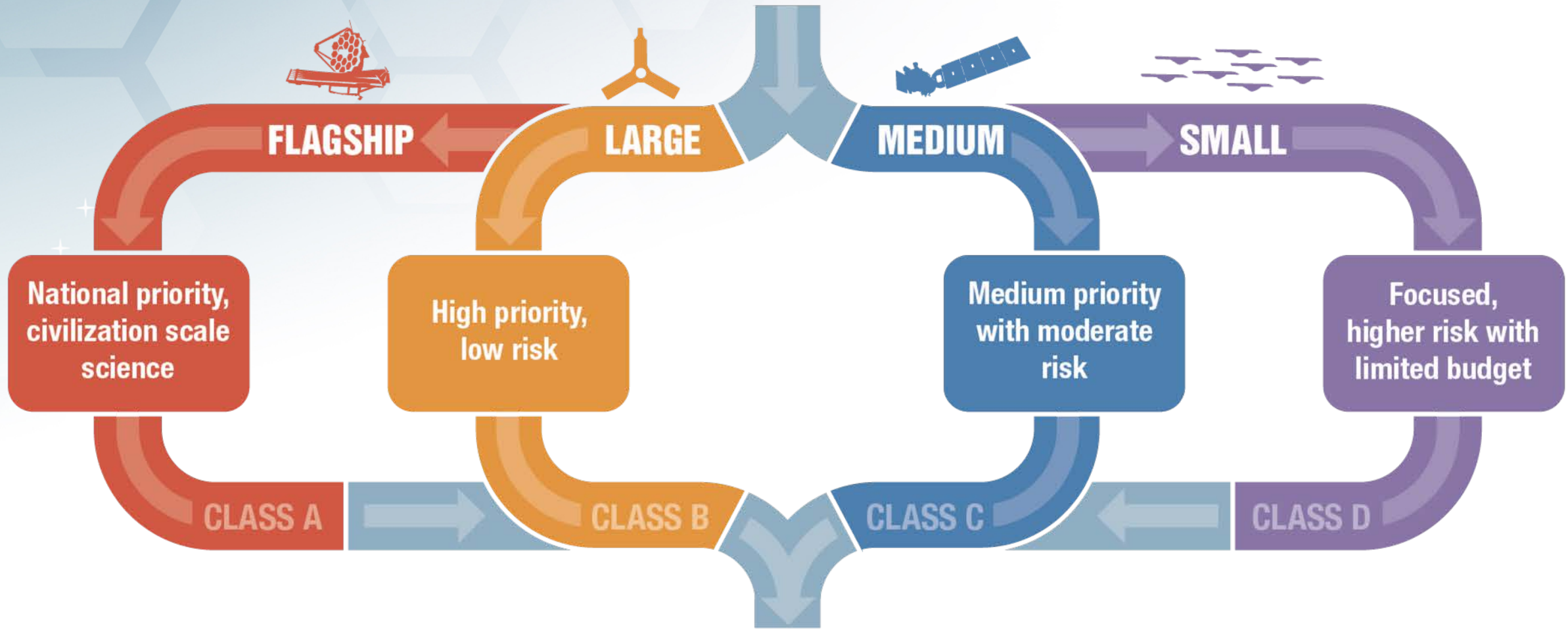
Enabling Technology: *Investment in new spectrometer (Dyson replaces Offner)*

Result: *Small satellite constellations are the new paradigm for future hyper spectral imaging missions*

Focus Areas

- NASA Science Overview
- Enabling New Science
- Fostering Innovation
- Cultivating Mission Success

BALANCED MISSION PORTFOLIO



GREAT SCIENCE

Get Involved!

- NASA Solicitation Website: https://nspires.nasaprs.com/external/
- Research Resources: https://science.nasa.gov/researchers
- Review Panel Volunteers: https://science.nasa.gov/researchers/volunteer-review-panels
- Technology Resources: https://science.nasa.gov/technology
- Flight Mission Resources: https://soma.larc.nasa.gov/
- Student Resources: https://science.nasa.gov/learners/learner-opportunities


EXPLORE AS
ONE
EXPLORER 1
INSIGHT
PARKER
ICESAT-2
WEBB