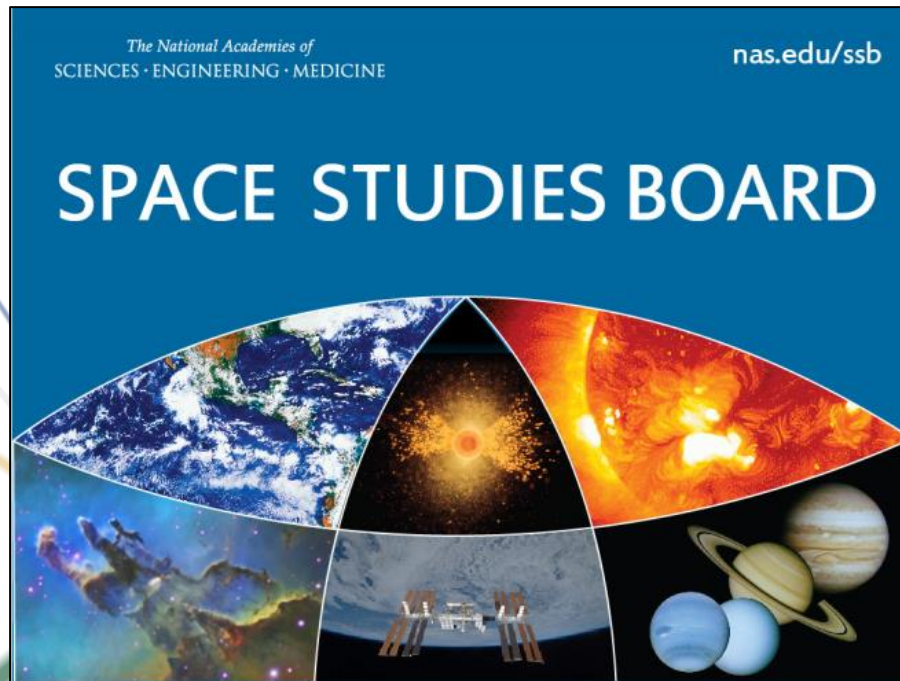


# ***Update from Space Studies Board*** ***Michael Moloney, SSB Director***



# National Academy of Sciences



The National Academy of Sciences was signed into being by President Abraham Lincoln on March 3, 1863, at the height of the Civil War. It is a private, self-perpetuating, society of distinguished scientists.

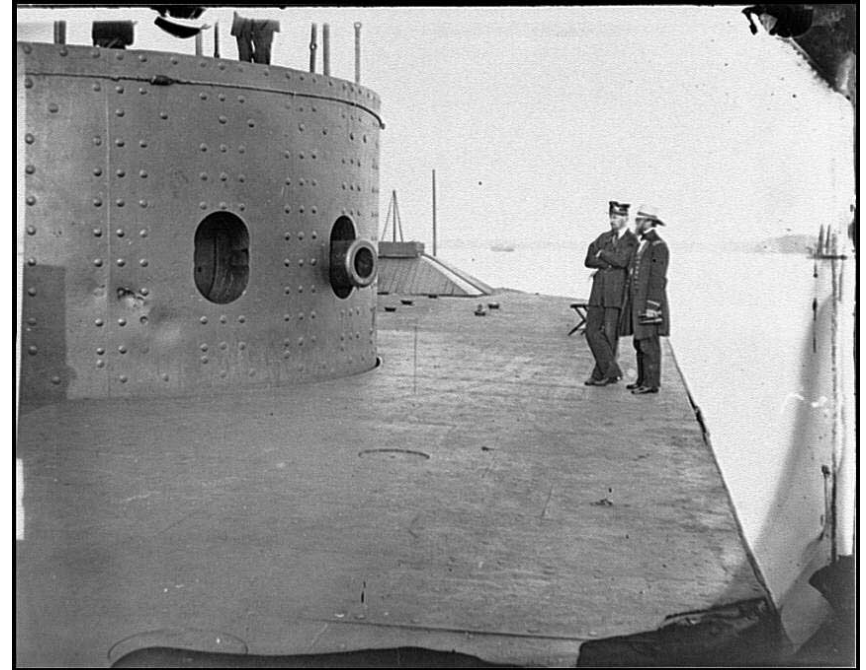
But, its Act of Incorporation, mandates it to "investigate, examine, experiment, and report upon any subject of science or art" when asked to do so by any department of the government.

# Providing Advice to the Nation

Many early Academy studies concerned technical issues associated with the conduct of the U.S. Civil War. But, as scientific issues become even more complex in the post-war years, the small number of NAS members could not keep up with requests for advice.

So, in 1916, the **National Research Council** was established as the mechanism by which the Academy would fulfill its mandate to advise the U.S. government.

Since 2016, we use the name **National Academies of Sciences, Engineering and Medicine**



# How the National Academies Works

The Academies has many different activities. The best know are its expert committees. Approximately 600 committees active at any given time.

The committees are composed of unpaid volunteers from academia and industry who meet 2, 3, or 4 times a year to deliberate on topics that are requested by Congress, federal and state agencies/departments and corporations, or which are self-initiated.

The Academies is financed via short-term study contracts and grants. That is, it is a soft-money organization.





# Space Science Board

Established by NAS in June 1958 in response to a joint request from the directors of NSF, NACA and ARPA for advice on the conduct of civil space research activities.

Space Science Board merged with elements of the Space Applications Board to create the Space Studies Board in 1988.

The Space Studies Board will celebrate its 60th anniversary on 26 June, 2018.

Today the SSB collaborates closely with the Academies Aeronautics and Space and Engineering Board.



The three men responsible for the success of Explorer 1, America's first Earth satellite which was launched January 31, 1958. At left is Dr. William H. Pickering, former director of JPL, which built and operated the satellite. Dr. James A. van Allen, center, of the State University of Iowa, designed and built the instrument on Explorer that discovered the radiation belts which circle the Earth. At right is Dr. Wernher von Braun, leader of the Army's Redstone Arsenal team which built the first stage Redstone rocket that launched Explorer 1.

# SSB Charge

- The SSB was established in 1958 to serve as the focus of the interests and responsibilities in space research for the National Academies of Sciences, Engineering, and Medicine.
- The SSB provides an independent, authoritative forum for information and advice on all aspects of space science and applications, and it serves as the focal point within the Academies for activities on space research. It oversees advisory studies and program assessments, facilitates international research coordination, and promotes communications on space science and science policy between the research community, the federal government, and the interested public.
- The SSB also serves as the U.S. National Committee for the International Council for Science Committee on Space Research (COSPAR).

# Space and Aeronautics at the Academies

## Space Studies Board and the Aeronautics and Space Engineering Board

- One of the larger units in the Academies.
- Conduct studies for NASA, USGS, USAF, NOAA, FAA, etc.
- Encompasses all of Space Science, Space Engineering, and Aeronautics.
- SSB's Signature product are the **decadal surveys** in space science—including planetary science and life/physical sciences.
- ASEB reviews NASA's aeronautics and space technology programs.

**National Academy of Engineering**  
C.D. (Dan) Mote, Jr., President

**National Academy of Sciences**  
Marcia McNutt, President

**National Academy of Medicine**  
Victor J. Dzau, President

**Executive Office**  
Bruce B. Darling, Executive Officer  
James F. Hinchman, Deputy Executive Officer & Chief Operating Officer

Program Units

Division of Behavioral and  
Social Sciences and Education

Division on Earth and  
Life Sciences

Division on Engineering and  
Physical Sciences

Health and Medicine Division

Policy and Global Affairs  
Division

Transportation Research Board

Gulf Research Program

**Division on Engineering and Physical Sciences**

Executive Director: Peter Blair  
Deputy Executive Directors: Joan Fuller and Scott Weidman

**Aeronautics and Space  
Engineering Board**

Director: Michael Moloney  
Chair: Alan Epstein

**Board on Mathematical Sciences  
and their Applications**

Director: Michelle Schwalbe  
Chair: Stephen Robinson

**National Materials and  
Manufacturing Board**

Director: James Lancaster  
Chair: Celia Merzbacher

**Air Force Studies Board**

Director: Joan Fuller  
Chair: Douglas Fraser

**Board on Physics and Astronomy**

Director: James Lancaster  
Chair: Barbara Jacak

**Naval Studies Board**

Director: Charles Draper  
Chair: Paul Schneider

**Board on Army Science  
and Technology**

Director: Bruce Braun  
Chair: David Maddox

**Computer Science and  
Telecommunications Board**

Director: Jon Eisenberg  
Chair: Farnam Jahanian

**Space Studies Board**

Director: Michael Moloney  
Chair: Fiona Harrison

**Board on Energy and  
Environmental Systems**

Director: Jim Zucchetto  
Chair: Andrew Brown

**Intelligence Community  
Studies Board**

Director: Alan Shaw  
Chair: Donald Kerr

**Board on Infrastructure and the  
Constructed Environment**

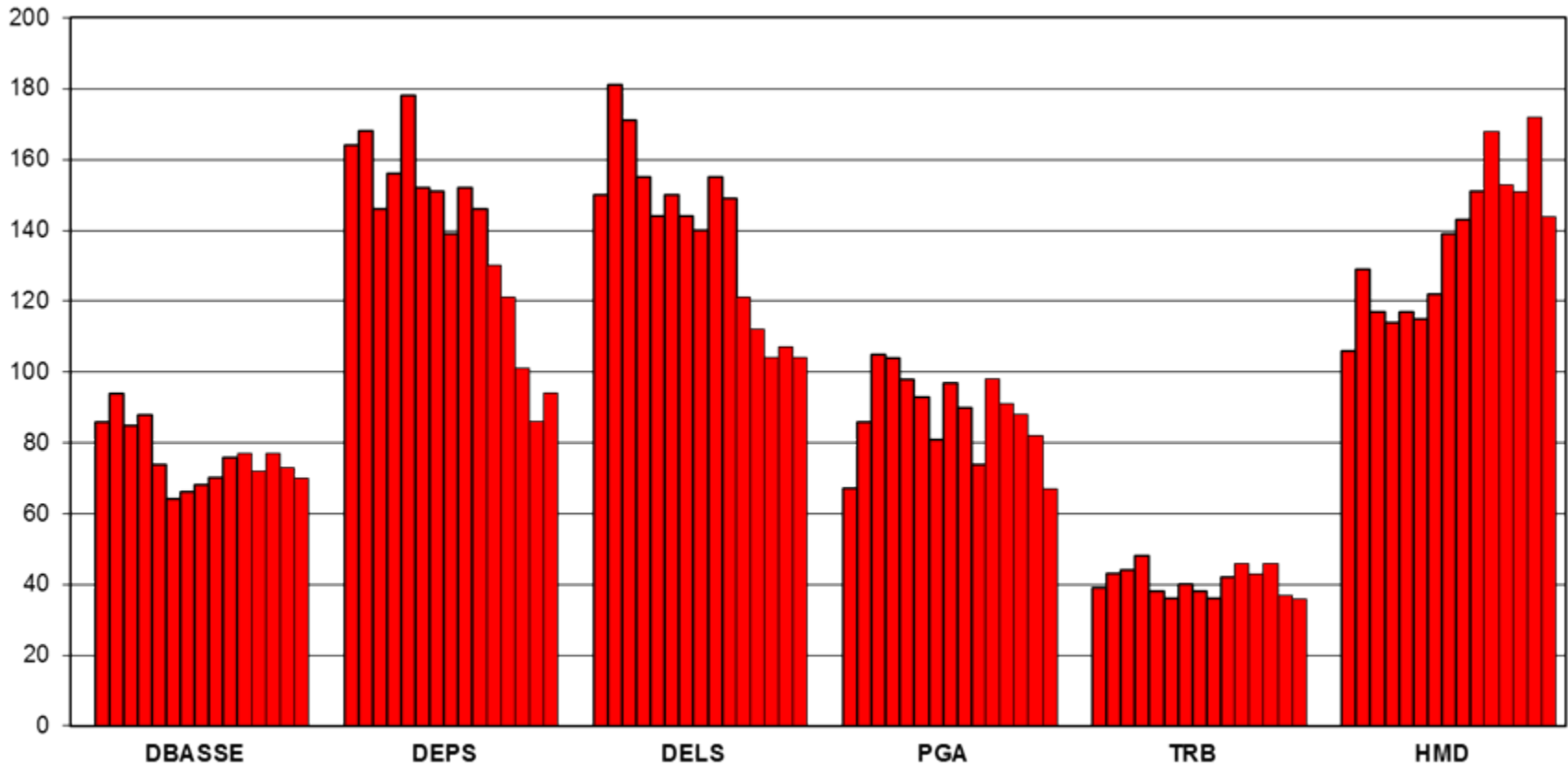
Director: Cameron Oskvig  
Chair: James Whittaker

**Laboratory Assessments Board**

Director: Jim McGee  
Chair: John Lyons



# Academies Appointed Committees\* by Program Division, 2001 – 2015

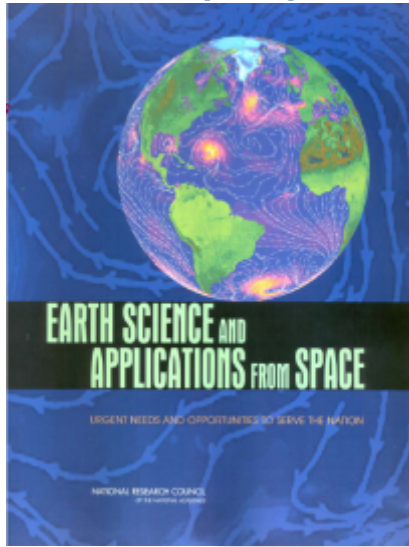


The Academies, in total, had over 500 active committees in 2015.

\*Appointed committees include boards, standing committees, roundtables, ad hoc study committees, and study panels.

# 54 Years of the SSB Decadal Surveys

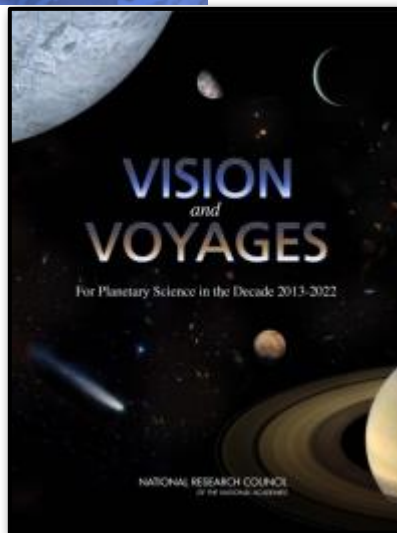
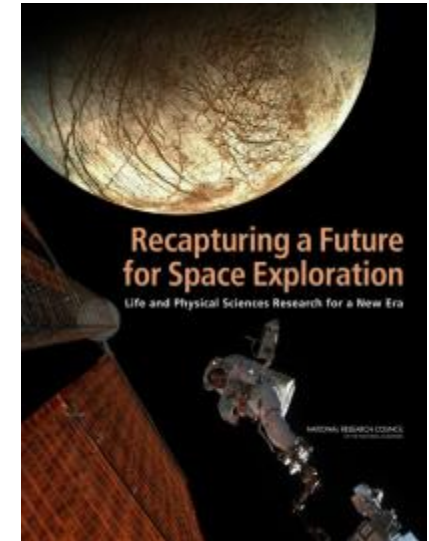
2007, in progress



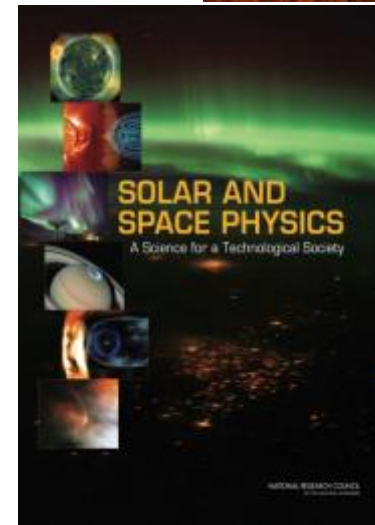
1963, 1973, 1982, 1991, 2001, 2010



2011



2003, 2011



2003, 2013

# SSB - Decadal Surveys

Among the advisory studies the SSB conducts, the **decadal surveys** stand out as the **signature products**.

The foundation of decadal surveys was the first astronomy decadal survey report in 1964. Now expanded to all of the space sciences and Earth science and applications from space and, most recently, the biological and physical sciences in space.

At the most fundamental level, decadal surveys are community-driven, **bottom-up studies** that aim to formulate a community consensus on the **most compelling science** questions for the decade ahead in each of the disciplines.

The studies also identify **prioritized lists of missions (science targets)** and, in some cases, ground-based research activities that can address the highest-priority science.

Involve the appointment of a steering committee and a set of 4-9 topical panels (no two surveys are the same) involving a total of up to 80-120 volunteers.

The studies involve **extensive community input** via hundreds of white papers, community forums, and other outreach activities, and the most recent round included an independent Cost Assessment and Technical Evaluation (the so-called CATE process) of proposed initiatives and recommendations made within defined budget scenarios.

# International Role for the Space Studies Board

Part of the charge to the Space Studies Board (SSB) from the National Academies is to “facilitate international research coordination”.

How does the SSB carry out this task?

- The SSB serves as the U.S. National Committee for the International Council for Science Committee on Space Research (COSPAR).
- Maintains relations with:
  - ICSU Committee on Space Research
  - International Academy of Astronautics
  - International Astronautical Federation
  - European Space Agency and JAXA
  - European Space Sciences Committee
  - Chinese Academy of Sciences – NSSC
  - Russian Academy of Sciences - IKI
  - Other international space partners such as: Canadian Space Agency, Roscosmos, CNES, ISRO, UNOOSA, etc
- Always interested in reaching out to similar advisory bodies around the globe.



# SSB Current Membership

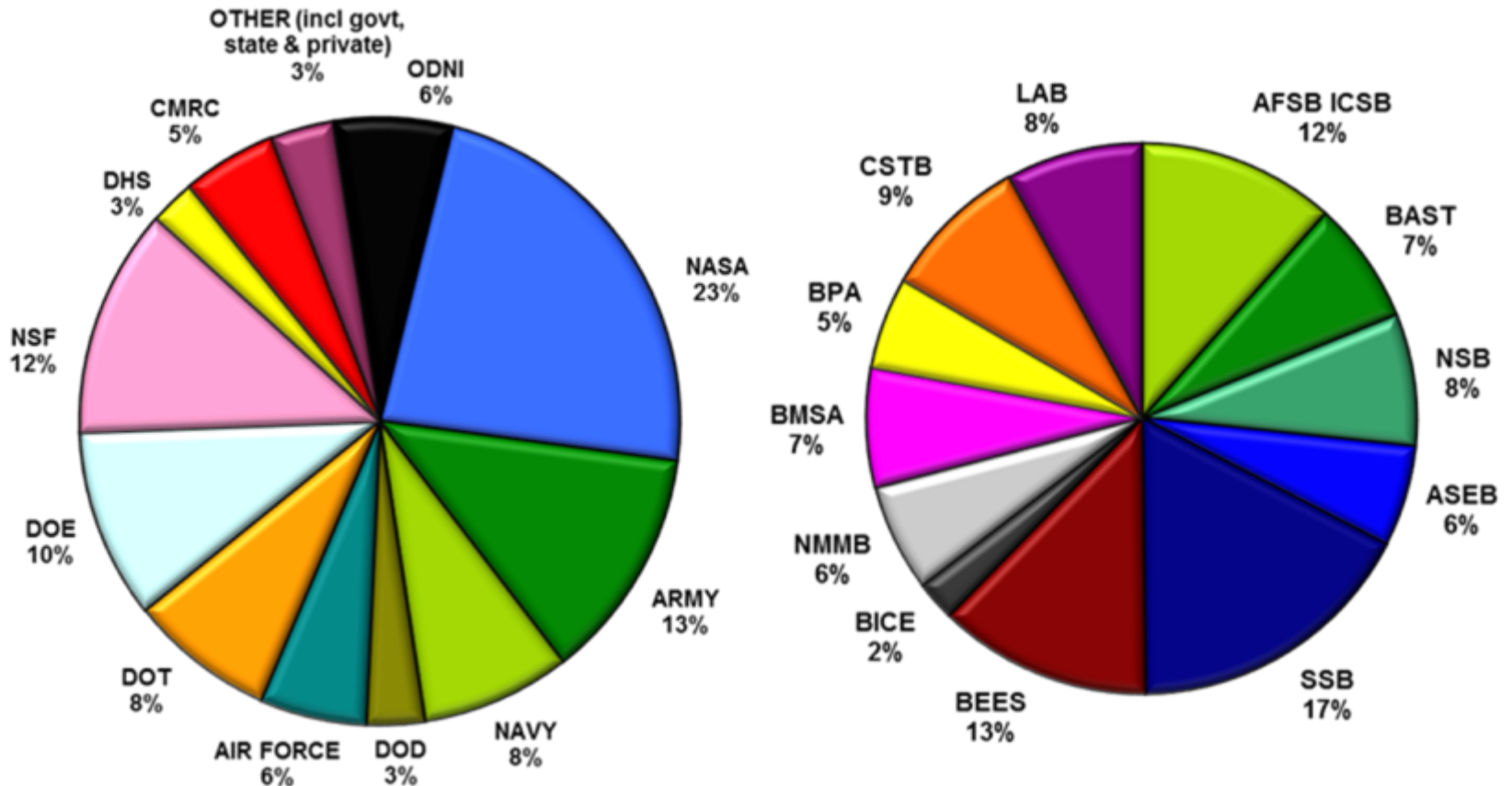
Fiona Harrison, Chair, California Institute of Technology	XCOM
Robert D. Braun, Vice Chair, University of Colorado Boulder	XCOM
David N. Spergel, Vice Chair, Princeton University**	
James G. Anderson, Harvard University	
Jeff M. Bingham, Consultant	XCOM
Jay C. Buckey, Geisel School of Medicine at Dartmouth	
Mary Lynne Dittmar, Dittmar Associates	XCOM
Joseph Fuller Jr., Futron Corporation	
Thomas R. Gavin, California Institute of Technology	
Sarah Gibson, National Center for Atmospheric Research	XCOM
Wesley T. Huntress, Carnegie Institution of Washington	
Anthony C. Janetos, Boston University	
Chryssa Kouveliotou, The George Washington University	XCOM
Dennis P. Lettenmaier, University of California, Los Angeles	
Rosaly M. Lopes, Jet Propulsion Laboratory	XCOM
David J. McComas, Princeton University	
Larry Paxton, Johns Hopkins University, Applied Physics Laboratory	
Saul Perlmutter, Lawrence Berkeley National Laboratory	
Eliot Quataert, University of California, Berkeley	
Barbara Sherwood Lollar, University of Toronto	
Harlan E. Spence, University of New Hampshire	
Mark H. Thiemens, University of California, San Diego	
Meenakshi Wadhwa, Arizona State University	

# Staffing at the SSB & ASEB

## The ASEB/SSB staff currently comprises:

- Board Director,
- 2 ASEB study directors (one part time)
- 4 SSB study directors (all full time – also one additional shared with BPA)
- 2 Research Associates (shared between SSB & ASEB)
- 3 meeting and travel coordinator staff (shared by both boards)
- 5 administrative staff Program Manager, Administrative Coordinator, Information and Communications Manager, and two financial management officers (shared by both boards).
  
- Budget of ASEB/SSB was ~30% of DEPS in CY 2016. Staff is ~25% of DEPS. Processed 45% of DEPS travel claims.

# 2015 DEPS Program Spending by Sponsor/Managing Board

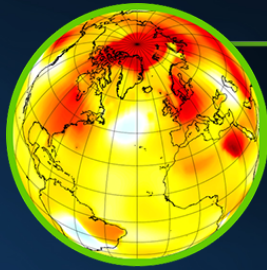


Total = \$21.93M

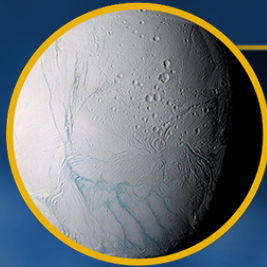
Some slides from NASA



# KEY SCIENCE THEMES



Safeguarding and  
Improving Life on Earth



Searching for  
Life Elsewhere



Expanding our Knowledge

# SCIENCE BY THE NUMBERS



## Spacecraft

105 missions\*  
88 spacecraft



## CubeSats

17 science missions\*  
11 technology demonstrations



## Balloon Payloads

13 science payloads  
13 piggyback/  
student payloads



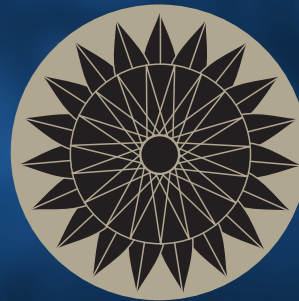
## Sounding Rocket Flights

14 science missions  
3 technology/student  
missions



## Earth-Based Investigations

25 major airborne missions  
8 global networks



## Technology Development

~\$400M invested annually



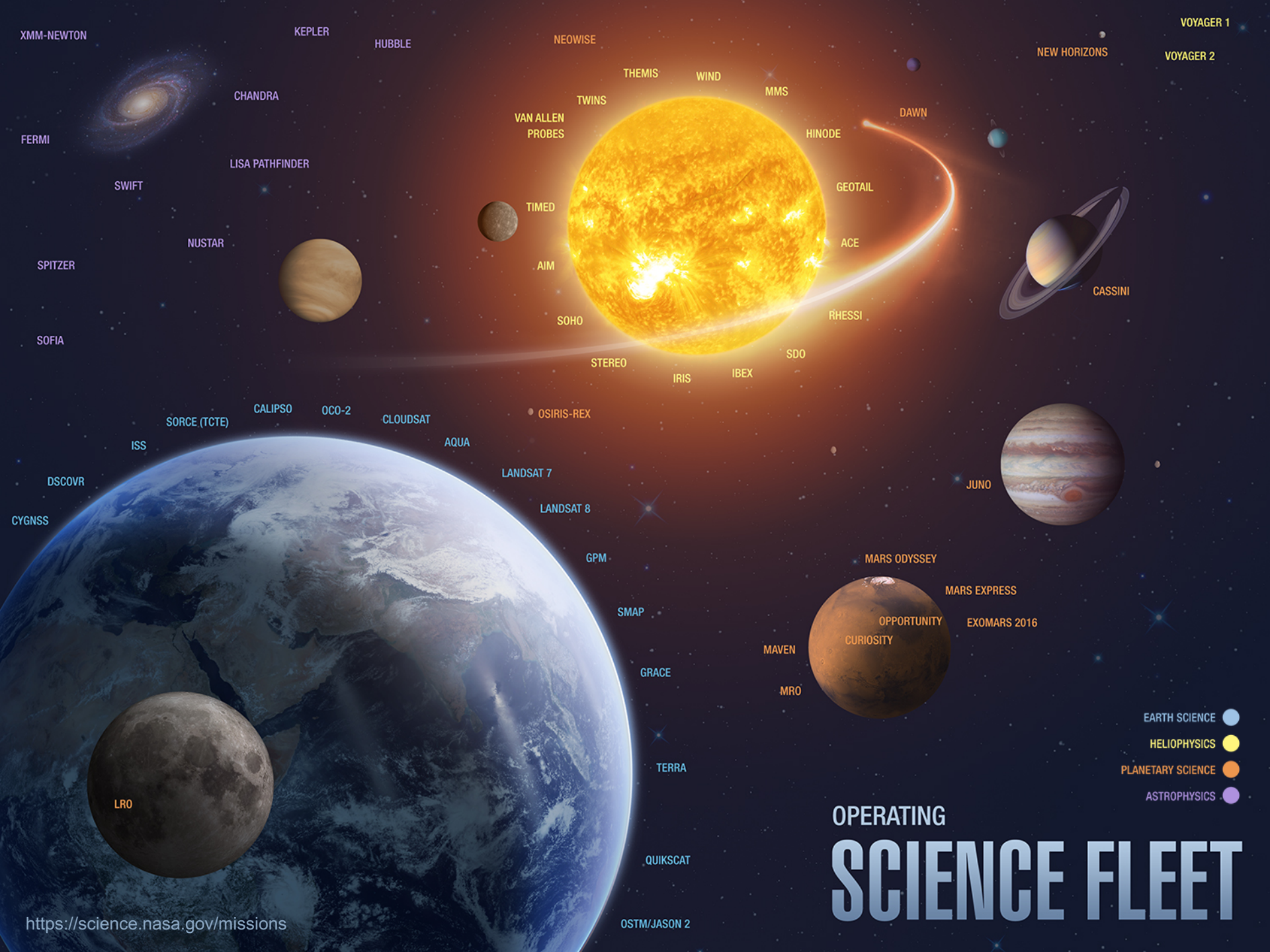
## Research

10,000+ U.S. scientists funded  
3,000+ competitively selected awards  
~\$600M awarded annually

\*122 space-based missions

As of April 27, 2017





XMM-NEWTON KEPLER HUBBLE NEOWISE THEMIS WIND MMS VOYAGER 1  
NEW HORIZONS VOYAGER 2

CHANDRA  
FERMI  
SWIFT  
LISA PATHFINDER

SPITZER  
SOFIA  
NUSTAR

ISS  
DSCOVR  
CYGNSS  
SORCE (TCTE)  
CALIPSO  
OCO-2  
CLOUDSAT  
AQUA

LRO  
<https://science.nasa.gov/missions>

TWINS  
VAN ALLEN PROBES  
TIMED  
AIM  
SOHO  
STEREO  
IRIS  
IBEX  
MMS  
Hinode  
Dawn  
GEOTAIL  
ACE  
RHessi  
SDO

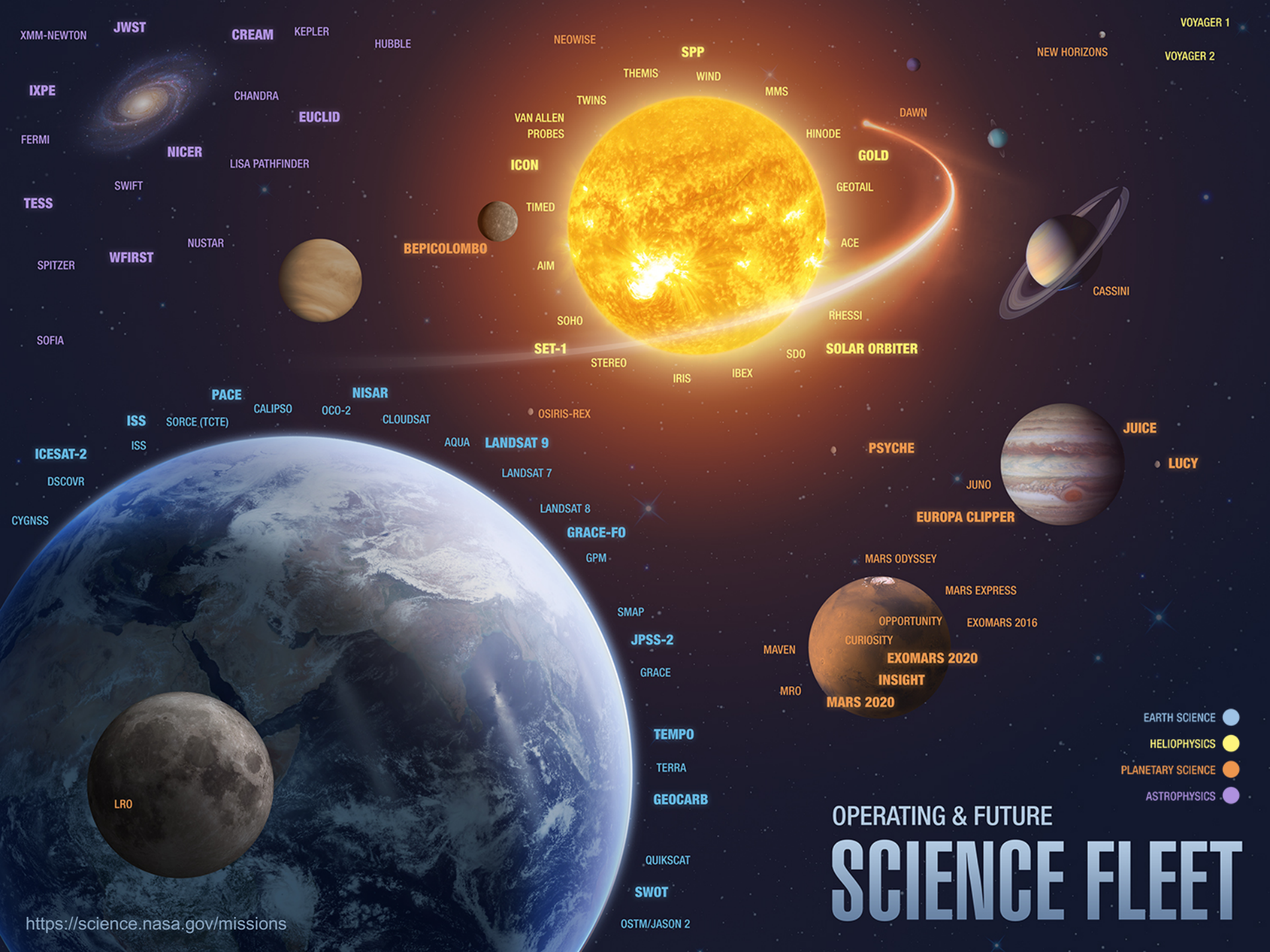
OSIRIS-REX  
LANDSAT 7  
LANDSAT 8  
GPM  
SMAP  
GRACE  
TERRA  
QUIKSCAT  
OSTM/JASON 2  
MARS ODYSSEY  
MARS EXPRESS  
OPPORTUNITY  
CURIOUSITY  
EXOMARS 2016  
MAVEN  
MRO

CASSINI  
JUNO

- EARTH SCIENCE ●
- HELIOPHYSICS ●
- PLANETARY SCIENCE ●
- ASTROPHYSICS ●

# OPERATING SCIENCE FLEET





**OPERATING & FUTURE SCIENCE FLEET**

**Legend:**  
 EARTH SCIENCE (Blue)  
 HELIOPHYSICS (Yellow)  
 PLANETARY SCIENCE (Orange)  
 ASTROPHYSICS (Purple)

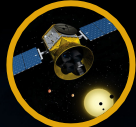
**Missions:**  
 XMM-NEWTON, JWST, CREAM, KEPLER, HUBBLE, NEOWISE, SPP, THEMIS, WIND, MMS, NEW HORIZONS, VOYAGER 1, VOYAGER 2  
 IXPE, CHANDRA, EUCLID, VAN ALLEN PROBES, TWINS, HINODE, DAWN, GOLD, GEOTAIL  
 FERMI, NICER, LISA PATHFINDER, ICON, TIMED, ACE, RHESSI, SOLAR ORBITER, SDO, IBEX, IRIS, STEREO, SET-1, SOHO, BEPICOLOMBO, AIM, NUSTAR, WFIRST, SPITZER, SOFIA, CASSINI  
 ISS, SORCE (TCTE), CALIPSO, OCO-2, CLOUDSAT, AQUA, LANDSAT 9, LANDSAT 7, LANDSAT 8, GRACE-FO, GPM, SMAP, JPSS-2, GRACE, TEMPO, TERRA, GEOCARB, QUIKSCAT, SWOT, OSTM/JASON 2  
 ICESAT-2, DSCOVR, CYGNSS, PACE, NISAR, OSIRIS-REX, PSYCHE, JUNO, EUROPA CLIPPER, JUICE, LUCY, MARS ODYSSEY, MARS EXPRESS, OPPORTUNITY, EXOMARS 2016, MARS 2020, MAVEN, MRO, CURIOUSITY, EXOMARS 2020, INSIGHT



# LOOKING AHEAD



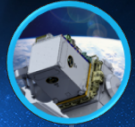
CREAM



TESS



ExoMars 2020



NICER



Solar Probe Plus



Landsat 9



JPSS-2



JPSS-1



ICESat-2



SOC



Mars2020



Lucy



Europa Clipper

Calendar Year

2017

2018

2019

2020

2021

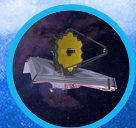
2022

2023

2024



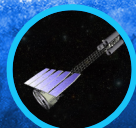
GOLD



JWST



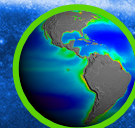
GOES-T



IXPE



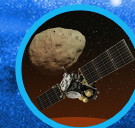
NISAR



PACE



Psyche



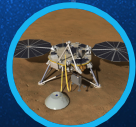
MMX



WFIRST



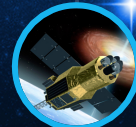
ICON



InSight



Sentinel-6A



XARM






JUICE



GRACE-FO



GOES-S

-  Safeguarding and Improving Life on Earth
-  Searching for Life Elsewhere
-  Expanding Knowledge



# President's Budget Request

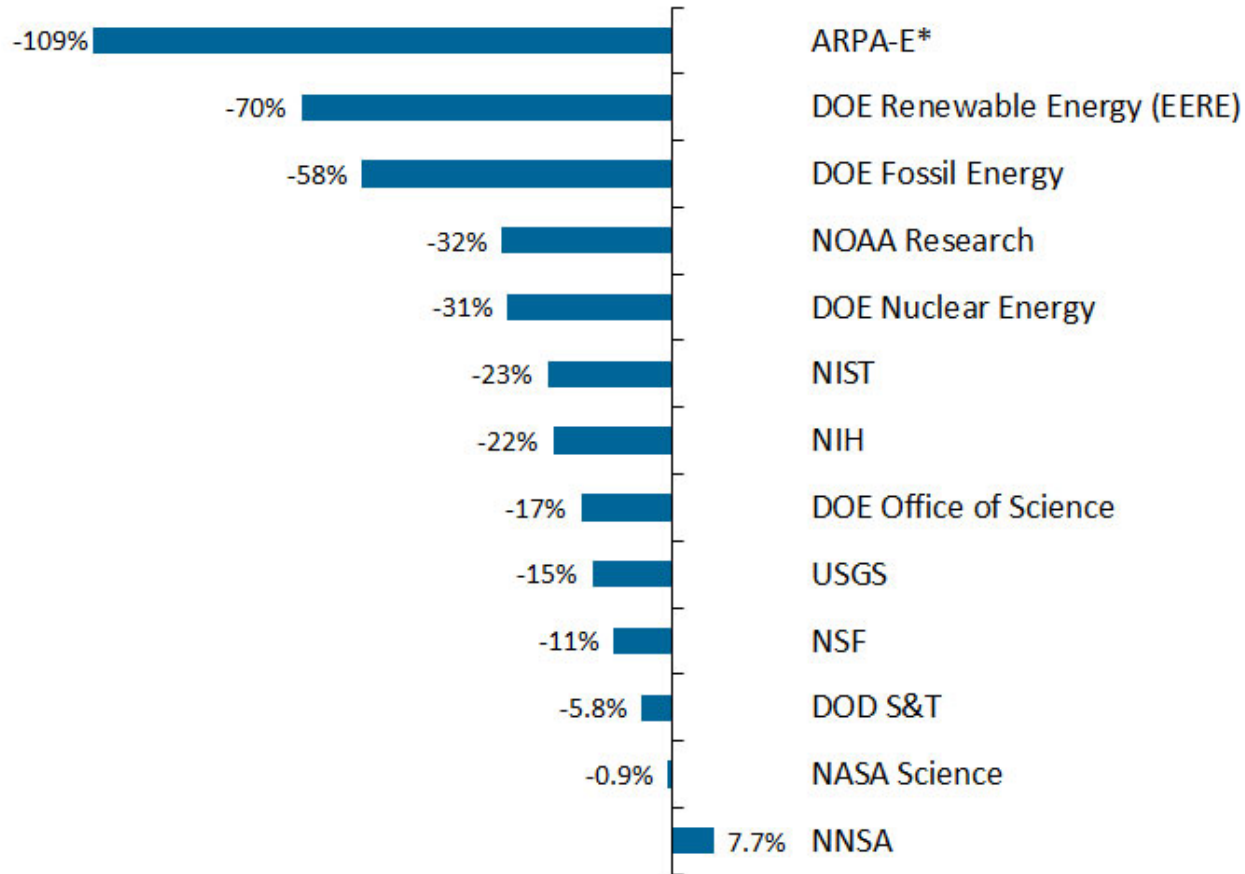
## FY 2018 PRESIDENT'S BUDGET REQUEST & FY15-FY17 APPROPRIATIONS

Updated May 23, 2017

	FY18 REQUEST	FY17 FINAL	FY17 HOUSE	FY17 SENATE	FY17 Request w/Mandatory	FY17 Request w/o Mandatory	FY16 FINAL	FY 2015 FINAL
<b>Science</b>	<b>5,711.8</b>	<b>5,764.9</b>	<b>5,597.0</b>	<b>5,395.0</b>	<b>5,600.5</b>	<b>5,302.5</b>	<b>5,589.4</b>	<b>5,244.7</b>
<b>Earth Science</b>	1,754.1	1,921.0	1,690.0	1,984.0	2,032.2	1,972.2	1,921.0	1,772.5
<b>Planetary</b>	1,929.5	1,846.0	1,846.0	1,355.9	1,518.7	1,390.7	1,631.0	1,437.8
<b>[Europa]</b>	[457.9]	[275]	[260]					
<b>Astrophysics</b>	816.7	750	792.9	807.0	781.5	696.5	730.6	684.8
<b>JWST</b>	533.7	569.4	569.4	569.4	569.4	569.4	620.0	645.4
<b>Heliophysics</b>	677.8	678.5	698.7	678.7	698.7	673.7	649.8	662.2
<b>Education</b>	0	37.0		42.0			37.0	42.0
<b>Aeronautics</b>	<b>624.0</b>	<b>660.0</b>	<b>712.0</b>	<b>601.0</b>	<b>790.4</b>	<b>634.5</b>	<b>640.0</b>	<b>651.0</b>
<b>Space Tech</b>	<b>678.6</b>	<b>686.5</b>	<b>739.2</b>	<b>686.5</b>	<b>826.7</b>	<b>690.6</b>	<b>686.5</b>	<b>596.0</b>
<b>Exploration</b>	<b>3,934.1</b>	<b>4,324.0</b>	<b>4,183.0</b>	<b>4,330.0</b>	<b>3,336.9</b>	<b>3,163.9</b>	<b>4,030.0</b>	<b>4,356.7</b>
<b>SLS</b>	1,937.8	2,150.0	2,000.0	2,150.0	1,310.3	1,229.9	2,000.0	1,700.0
<b>[EUS]</b>			[250.0]	[300]				
<b>Orion</b>	1,186.0	1,350.0	1,350.0	1,300.0	1,119.8	1,053.4	1,270.0	1,194.0
<b>GSDO</b>	460.4	429.0	429.0	484.0	429.4	403.2	410	351.3
<b>Exploration R&amp;D</b>	<b>350.0</b>	<b>395.0</b>	<b>404.0</b>	<b>396.0</b>	<b>477.3</b>	<b>477.3</b>	<b>350</b>	<b>306.4</b>
<b>[AES]</b>	[210.0]	[75.0 for Habitats]	[75.0 for Habitats]	NA	324.1	324.1	[n/a]	[182.9]
<b>Space Operations</b>	<b>4,740.8</b>	<b>4,950.7</b>	<b>4,890.3</b>	<b>4,950.7</b>	<b>5,075.8</b>	<b>5,075.8</b>	<b>5,029.2</b>	<b>3,827.8</b>
<b>ISS</b>	1,490.6	NA	NA	NA	1,430.7	1,430.7	N/A	N/A
<b>Cargo and Crew</b>	1,683.2				887.4	887.4	N/A	N/A
<b>Commercial Crew Program</b>	731.9				2,757.7	2,757.7	Up to 1,243.8	805.0
<b>Education</b>	37	100.0	115.0	108.0	100.1	100.1	115.0	119.0
<b>Safety, Security &amp;MS</b>	2,830.2	2,768.6	2,835.4	2,796.7	2,836.8	2,836.8	2,768.6	2,758.9
<b>CECR</b>	<b>496.1</b>	<b>360.7</b>	<b>398.0</b>	<b>400.0</b>	<b>419.8</b>	<b>419.8</b>	<b>388.9</b>	<b>419.1</b>
<b>OIG</b>	<b>39.3</b>	<b>37.9</b>	<b>38.1</b>	<b>38.1</b>	<b>38.1</b>	<b>38.1</b>	<b>37.4</b>	<b>37.0</b>
<b>TOTAL</b>	<b>19,100.0</b>	<b>19,653.3</b>	<b>19,508.0</b>	<b>19,306.0</b>	<b>19,025.1</b>	<b>18,262.1</b>	<b>19,285.0</b>	<b>18,010.2</b>

# FY18 Trump Budget Request

(% change from FY17 enacted)



\* Includes use of \$46 million in prior year balances

American Institute of Physics | [aip.org/fyi](http://aip.org/fyi)

# Ongoing Standing & Discipline Activities

## Standing Activities

- Committee on Biological and Physical Sciences in Space (joint activity)

## Discipline Committees

- Committee on Astrobiology and Planetary Sciences – CAPS
- Committee on Astronomy and Astrophysics – CAA
- Committee on Earth Science and Applications from Space – CESAS
- Committee on Solar and Space Physics – CSSP
- Each Spring these committees meet during **Space Science Week** in Washington DC.
- Space Studies Board also acts as US National Committee for COSPAR
- Space Studies Board also exchanges participants with the European Space Sciences Committee

# Discipline Committee Tasks

## Revised Statement of Task (highlights)::

- Operate as an ad-hoc overarching purpose of the committee is to support scientific progress to assist the federal government in planning programs in these fields by providing advice on the implementation of decadal survey recommendations.
- Provide an independent, authoritative forum for identifying and discussing issues between the research community, federal government, and the interested public.
- At each of its in-person meetings, as appropriate, the committee may prepare concise assessments of progress on the implementation of the decadal survey's recommended scientific and technical activities. The assessments will be based on evidence gathered by the committee at its in-person and virtual meetings. The committee's assessment reports may include findings and conclusions on key strategies being pursued by the agencies and the status of agency actions that relate to the state of implementation. The reports may also highlight scientific discoveries and engineering and technical advances relevant to progress on the science objectives identified in the decadal reports.
- For advisory activities assessed to require a more in-depth review assist the Academies in formulating the task and committee membership for such studies.

# Discipline Committees Work Plan

- Chartered by the Academies for a five-year period 2016-2021. Should a change in a committee's charge be required before 2021, Academies and agency approval would be sought at that time.
- The committee are populated with a depth and breadth of expertise that qualify it (adjusted by annual membership review and appointments) to analyze and provide **findings and conclusions** on issues bearing on **implementation of the decadal survey**.
- Approximately 15-20 members are appointed for terms of 2 years, with 2 possible extensions in the lifetime of the committee.
- The membership and composition and balance of the committee is reviewed annually and **conflicts of interests assessed against the range of recommendations in the decadal survey and implementation plans and strategies that have emerged since the survey report's release**.
- The committee shall meet in person at least twice per year.
- After each meeting of the committee, a concise report may be authored and delivered to the sponsoring agencies within 45-60 days of a committee meeting and subsequently released to the public.
- For advisory activities assessed to require a more in-depth review assist the Academies in formulating the task and committee membership for such studies.

# Committee on Astronomy & Astrophysics

- Main focus is on the preparation for the next Astro 2020 decadal survey.
  - Internal consultation group—will discuss international engagement
  - Many outreach activities being considered
  - Survey expected to begin Dec 2018 and finish Dec 2020.
- CAA decided to write a short report on a question from NASA about the upcoming Small Explorer mission (SMEX) announcement of opportunity.
- Committee heard from NASA on plans for independent review of WFIRST implementation and discussed implementation of other recommendations from NWNH midterm report.
- Held joint session with CAPS on the Search for Life.
- Committee discussed congressionally-mandated studies on science strategies for astrobiology and exoplanet research.



# Committee on Astrobiology and Planetary Science

Overall, the Planetary Science Division is on track

- Mars 2020 sample caching mission continues its development
- Europa Clipper moving forward in Phase B (design phase)
- Two Discovery missions selected (Psyche (M-type asteroid orbiter) and Lucy (multi-Trojan asteroid flyby), one in extended phase A (NEOCam)
- Next New Frontiers mission proposals submitted April 28<sup>th</sup>
- Ocean Worlds program is part of the recent Presidential budget

Discussion points to further consider

- Last year, NASA was directed to launch Clipper on SLS and add a lander. Clipper and Lander funded in appropriated FY17 budget
- Future Mars missions and Europa Lander not in President's proposed FY18 budget
- Committee discussed the challenges of maintaining a balanced solar system exploration program
- Committee discussed congressionally-mandated studies on science strategies for astrobiology and exoplanet research.

# Committee on Biological and Physical Sciences in Space

- New Director of NASA's Division of Space Life and Physical Sciences Research and Applications
- The committee discussed how NASA's microgravity science portfolio is progressing
- Committee held a symposium on "Exploration Systems Interface with Biological and Physical Behaviors". Recording will be publicly available soon.
- The successful transition of microgravity research from ISS to a post-ISS era continues to be a central issue, including 2024 date
- Increasing focus on Gateway and transition to deep space
- Crew time, Soyuz and commercial crew relating to science
- Predicting how much science will get done before 2024 or before deep space or before/for Gateway and on Gateway
- CBPSS overseeing ad hoc study committee reviewing NASA's progress on implementing recommendations in 2011 microgravity decadal report

# Committee on Earth Science and Applications from Space

- Committee may engage in helping to organize a workshop or study on “Big Data” and Earth science; for example:
  - Cutting-edge data analytics approaches are evolving quickly and machine learning, predictive analytics, and other algorithms have the potential to be more broadly applied to Earth observation data
- Committee discussed the way NOAA is conducting its data buy;
- Committee discussed how proper data utilization is dependent on a close collaboration between data users and data providers. Committee heard that collaborations between NASA & NOAA would be more likely to result in data of operational if NOAA had some involvement in the early design phases of a mission.
- CESAS members are reviewing the elements of a potential study called for in the *Weather Modernization Act 2017*.

# Committee on Solar and Space Physics

- The CSSP continues to be interested in national and international space weather policy and research
- At the March 2017 meeting, the committee was tasked with writing a very brief report on options to consider for the creation of joint NASA-NSF heliophysics science centers (HSCs). The HSCs were recommended as part of the DRIVE initiative in the 2013 decadal survey. Topics in the report include:
  - How to make HSCs unique from other research elements, and
  - Options for implementation (for example, consideration of a virtual institution).
- The report will be released in early June, 2017.
- Committee also discussed the recent report on NSF Geo-Sciences portfolio review.

# SPACE SCIENCE WEEK

The National  
Academies of  
SCIENCES  
ENGINEERING  
MEDICINE



March 28-30, 2017

- Five SSB Sub-Committees
- met in plenary and parallel sessions.
- Around 150-200 attended the meeting
- Plenary session focus was on international collaboration and Big Data & Space Science
- Fourth Annual Space Science Week Public Lecture was on Ocean Worlds
- ESSC liaison members have attended since 2015 – hope we can continue having a liaison to each of the standing committees attend future SSWs.



THE 2017 SPACE SCIENCE WEEK PUBLIC LECTURE

The Search for

**LIFE**  
in **OCEANS**  
BEYOND EARTH

More Information at  
[www.nas.edu/ssw](http://www.nas.edu/ssw)

March 27-29, 2018,  
NAS Building Wash DC



## Space Studies Board Spring Meeting

- Major 1-Day symposium with ASEB
- Follow up on 2009 report
- Around 130 attended the meeting
- Themes:
  - Space in Support of National and International Priorities
  - Future of Exploration and Discovery
  - Public Private Partnerships in Support of National Space Priorities



To view video  
[bit.ly/CivilSpaceSymposium](http://bit.ly/CivilSpaceSymposium)



# Recent Publications

- Review of NASA's Planetary Science Division's Restructured Research and Analysis Programs (SSB)
- Assessment of the NSF's 2015 Geospace Portfolio Review (SSB)
- Extending Science—NASA's Space Science Mission Extensions and the Senior Review Process (SSB)
- NASA Space Technology Roadmaps and Priorities Revisited (ASEB)
- New Worlds, New Horizons: Midterm Assessment (SSB/BPA)
- Achieving Science with CubeSats: Thinking Inside the Box (SSB)
- Continuity of NASA Earth Observations from Space: A Value Framework (SSB)
- Review of the MEPAG Report on Mars Special Regions (SSB)
- The Space Science Decadal Surveys: Lessons Learned and Best Practices (SSB)
- Pathways to Exploration—Rationales and Approaches for a U.S. Program of Human Space Exploration (ASEB with SSB)
- NASA's Strategic Direction and the Need for a National Consensus (DEPS)
- NASA Space Technology Roadmaps and Priorities: Restoring NASA's Technological Edge and Paving the Way for a New Era in Space (ASEB)

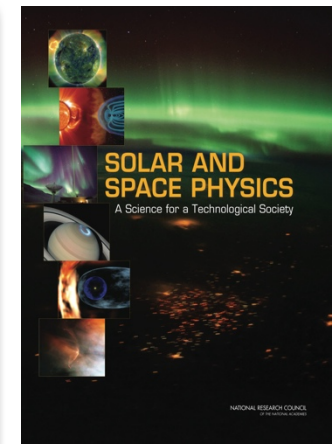
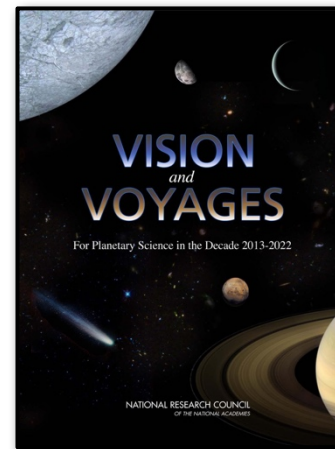
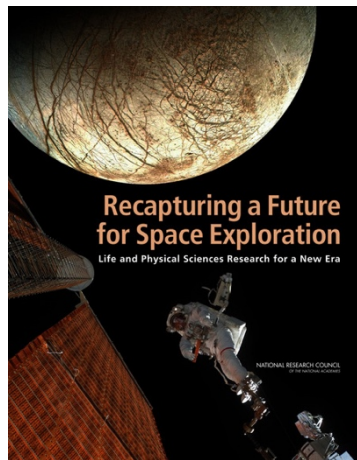
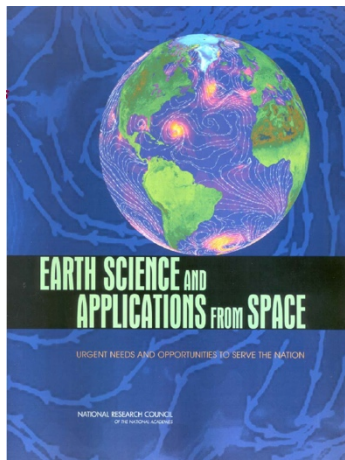
All these are accessible by going to [www.nationalacademies.org/spaceandaeronautics](http://www.nationalacademies.org/spaceandaeronautics)

# Ongoing SSB Study Activities

1. Review of Progress Toward Implementing the Decadal Survey Vision and Voyages for Planetary Sciences
  2. Review of Planetary Protection Policy Development Processes
  3. Committee on Large Strategic NASA Science Missions: Science Value and Role in a Balanced Portfolio
  4. Decadal Survey for Earth Science and Applications from Space
  5. A Midterm Assessment of Implementation of the Decadal Survey on Life and Physical Sciences Research at NASA (joint with ASEB)
  6. SMD Education Meetings of Experts (joint with BOSE)
  7. Planetary Protection Meetings of Experts
  8. Review of NASA's Planetary Science Division's Restructured Research and Analysis Program
  9. Searching for Life Across Space and Time: A Workshop
  10. Open Code Study
  11. Planetary Sample Science Study
- CAS-NAS Forum for New Leaders in Space Science
  - Observer at ESF/ESSC Planetary Protection Outer Solar System.

# Upcoming or Possible SSB Study Activities

- Astrobiology: State of the Science (congressionally mandated)
- Exoplanet Science Strategy (congressionally mandated)
- Phobos /Deimos Planetary Protection Study (with ESF/ESSC)
- NOAA Weather Satellite Study (congressionally mandated)
  - likely to be joint with DELS/BASC
- Review of NASA-SMD Science Plan
- Astro 2020 Decadal Survey
- Planetary 2022 Decadal Survey
- Heliophysics Mid-decadal Review
  
- Space Law Study
- Space Weather Study



For more information visit:

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SSB Meetings

November 1-3, 2017 Irvine CA

May 1-3, 2018, Washington DC

November 7-9, 2018 Irvine, CA

Space Science Week

March 27-29, 2018, Washington DC

March 26-28, 2010, Washington DC