

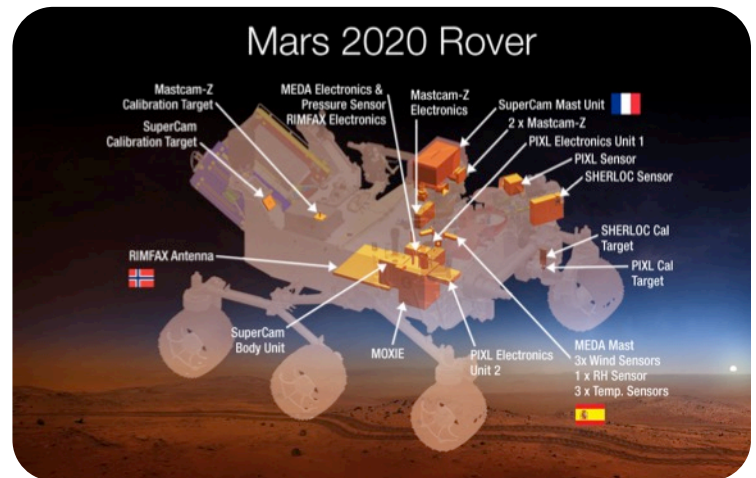
**Decadal Surveys**



- Scientific *community sets priorities*, recommending *balanced portfolios* including:
  - **Flagship** missions and large facilities
  - **Competed mid-scale** projects & *New Frontiers* missions
  - **Competed small** research grants, technology development projects, and *Discovery- & Explorer-class* missions

**Revolutionary Flagships**

A **Mars 2020** rover will cache samples of the Martian surface—the first crucial step toward returning Martian material back to state-of-the-art labs here on Earth. Flagship-class missions **demonstrate US leadership in science and technology** and **drive technology development**.

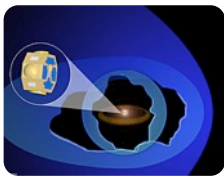


**Small & Mid-Scale Missions**

*Discovery | Explorer  
New Frontiers*



Kepler has opened our eyes to the billions of potentially habitable planets in our Milky Way galaxy.



IBEX is helping us to better understand our sun and the boundaries of our solar system.

- Most led by researchers at private institutions
- Cost-capped & competitive
- Broadens participation in space sciences
- Encourages innovation
- Delivers high return on federal investment.
- Develops & maintains technical workforce



*New Horizons* is set to fly by Pluto and its moons July 2015, and on to nearby objects identified with *Hubble*.

**Competed Grants**

- Astronomical sciences funded at NASA, National Science Foundation (NSF), and Dept. of Energy (DOE) Office of Science
- Awarded based on the *merit and breadth of impact* of the proposed scientific research
- Research dollars go to *scientists and students throughout the country*.

**Education & Public Outreach**

NASA/IPAC Teacher Archive Research Program (NITARP) Educator Jacqueline Barge works on original astronomical research with her high school students.



Large crowds gathered in Times Square, and many other locations, to celebrate the NASA Curiosity Rover's successful landing on Mars.

## Astronomical Sciences in FY 2016 President's Budget Request

- **Cuts or holds flat** federal astronomical science programs
- **Forces harmful tradeoffs** between facilities and competitive research grants

	FY 2014 Actual	FY 2015 Enacted	FY 2016 Request	Change FY 16-15 Amount	Percent
<b>Total R&amp;D</b>	\$136,249	\$136,449	<b>\$145,223</b>	<b>\$8,774</b>	<b>6.4%</b>
<b>NASA</b>	\$17,647	\$18,010	<b>\$18,529</b>	<b>\$518.9</b>	<b>2.9%</b>
<i>Science (SMD)</i>	\$5,148	\$5,245	<b>\$5,289</b>	<b>\$43.9</b>	<b>0.8%</b>
<i>Planetary Science</i>	\$1,343	\$1,438	<b>\$1,361</b>	<b>-\$76.5</b>	<b>-5.3%</b>
<i>Astrophysics</i>	\$678	\$727	<b>\$709</b>	<b>-\$17.7</b>	<b>-2.4%</b>
<i>Heliophysics</i>	\$643	\$662	<b>\$651</b>	<b>-\$11.0</b>	<b>-1.7%</b>
<b>NSF</b>	\$7,172	\$7,344	<b>\$7,724</b>	<b>\$379.4</b>	<b>5.2%</b>
<i>Math, Phys Sci (MPS)</i>	\$1,268	\$1,337	<b>\$1,367</b>	<b>\$30.0</b>	<b>2.2%</b>
<i>Astro. Sci (AST)</i>	\$238	\$244	<b>\$247</b>	<b>\$2.4</b>	<b>1.0%</b>
<b>DOE-Science</b>	\$5,071	\$5,068	<b>\$5,340</b>	<b>\$272.1</b>	<b>5.4%</b>
<i>Cosmic Frontier</i>	\$99	\$107	<b>\$119</b>	<b>\$12.5</b>	<b>12%</b>

Source: FY 2016 President's Budget Request, FY 2015 Omnibus; millions USD.  
James Webb Space Telescope fully funded on baseline.

### LUNAR RECONNAISSANCE ORBITER



NASA/MER prog.



The FY 2016 Budget Request would end the *Lunar Reconnaissance Orbiter* (above) and *Mars Opportunity Rover* missions early.

An expert panel of scientists recently rated both missions highly valuable and worth extending beyond FY 2016, at a minimum.

## Funding Research

The FY 2016 Request would underinvest in core competitive research programs at NASA and NSF, which enable the research community to maximize the scientific return on taxpayer investment in missions and facilities.

## Education & Collaboration



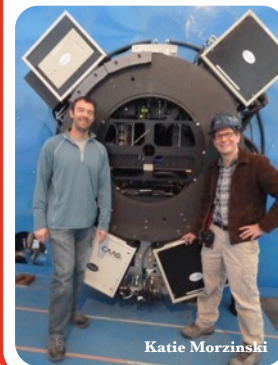
NASA THEMIS-ARTEMIS EPO

Left. We are **concerned** that the request would **reduce funding for SMD STEM Education activities by more than 50% (\$42M → \$20M).**

Right. Restrictions on **conference participation** by NASA scientists, engineers, and program officers **harm the scientific enterprise** and limit public-private collaborations.



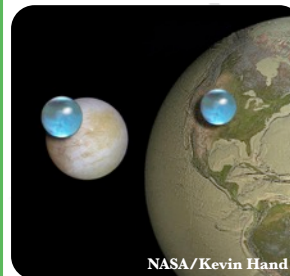
AAS 224 © 2014 Joson Images



Katie Morzinski

Left. University of Arizona (UA) researchers pose with their revolutionary adaptive optics system, developed with support from NSF and NASA. The instrument, in use on the Magellan telescope, was recently used to make the **sharpest ever visible light images.**

## Expanding the Frontier

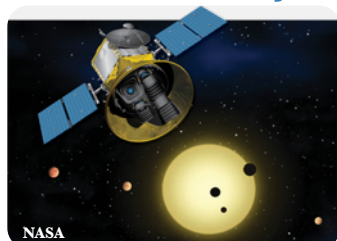


NASA/Kevin Hand

Left. **Encouraged** by Administration's proposal to move a **Europa flyby mission officially into formulation.** A mission to Europa, one of the most promising extraterrestrial habitable environments, is one of the top priorities in the most recent planetary science decadal survey.

## Small/mid-scale Projects

Right. The **Transiting Exoplanet Survey Satellite (TESS)** Explorer mission will scan the nearest stars for signs of potentially habitable planets.



NASA

We **applaud** efforts to **increase the cadence** for small-scale *Discovery* and *Explorer* and mid-scale *New Frontiers* missions.