

# On the Shore of the Cosmic Ocean

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National Aeronautics and  
Space Administration



*“The surface of the Earth is the **shore of the cosmic ocean**. On this shore, we've learned most of what we know. Recently, we've waded a little way out, maybe ankle-deep, and the water seems inviting.”*

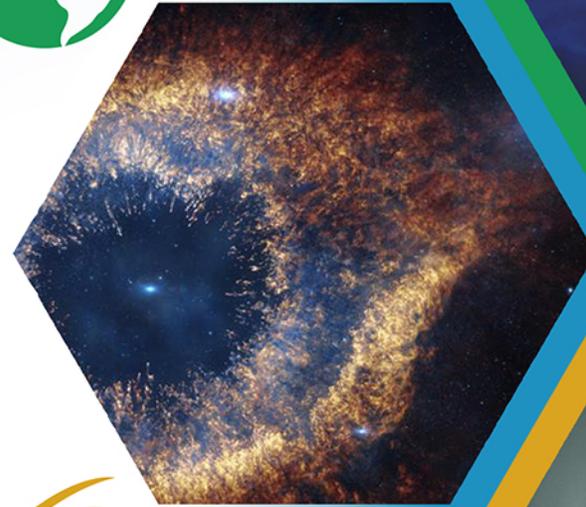
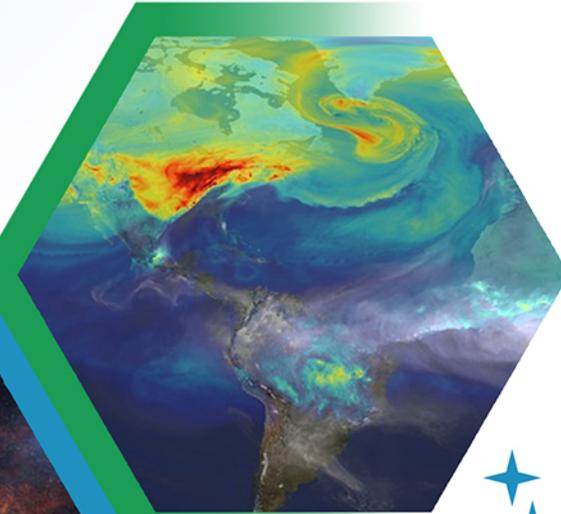
Carl Sagan



*...the shore of the cosmic ocean  
—Carl Sagan*

# Key Science THEMES

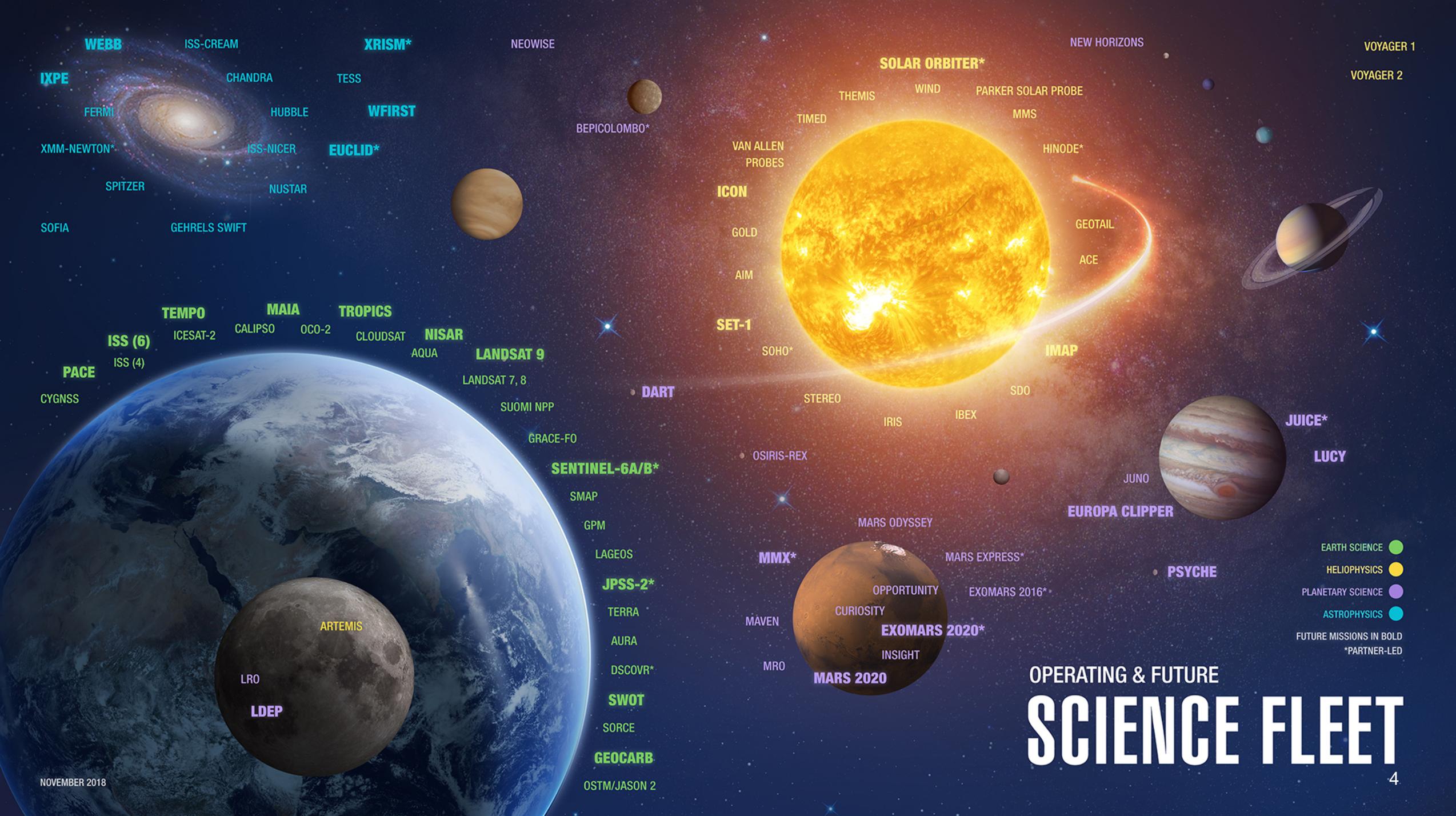
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Life on Earth



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Search for  
Life Elsewhere





**WEBB** ISS-CREAM **XRISM\*** NEOWISE

**IXPE** CHANDRA TESS

FERMI HUBBLE **WFIRST**

XMM-NEWTON\* ISS-NICER **EUCLID\***

SPITZER NUSTAR

SOFIA GEHRELS SWIFT

**TEMPO** **MAIA** **TROPICS**

**ISS (6)** ICESAT-2 CALIPSO OCO-2 CLOUDSAT **NISAR**

**PACE** ISS (4) **LANDSAT 9**

CYGNSS LANDSAT 7, 8

SUOMI NPP **DART**

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

TIMED MMS

VAN ALLEN PROBES HINODE\*

**ICON** GOLD ACE

AIM GEOTAIL

**SET-1** SOHO\* IMAP

STEREO SDO

IRIS IBEX

OSIRIS-REX

JUNO **EUROPA CLIPPER**

**PSYCHE**

MARS ODYSSEY

**MMX\*** MARS EXPRESS\* EXOMARS 2016\*

OPPORTUNITY

CURIOSITY **EXOMARS 2020\***

MAVEN INSIGHT

MRO **MARS 2020**

VOYAGER 1

VOYAGER 2

**JUICE\***

**LUCY**

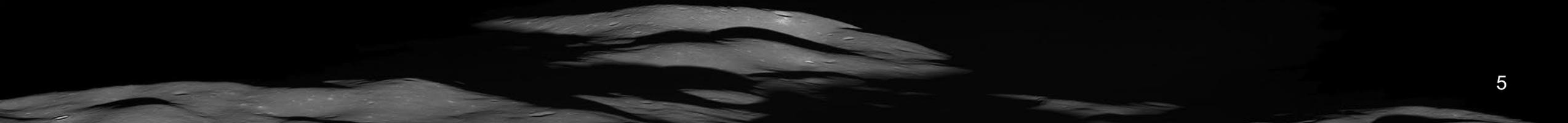
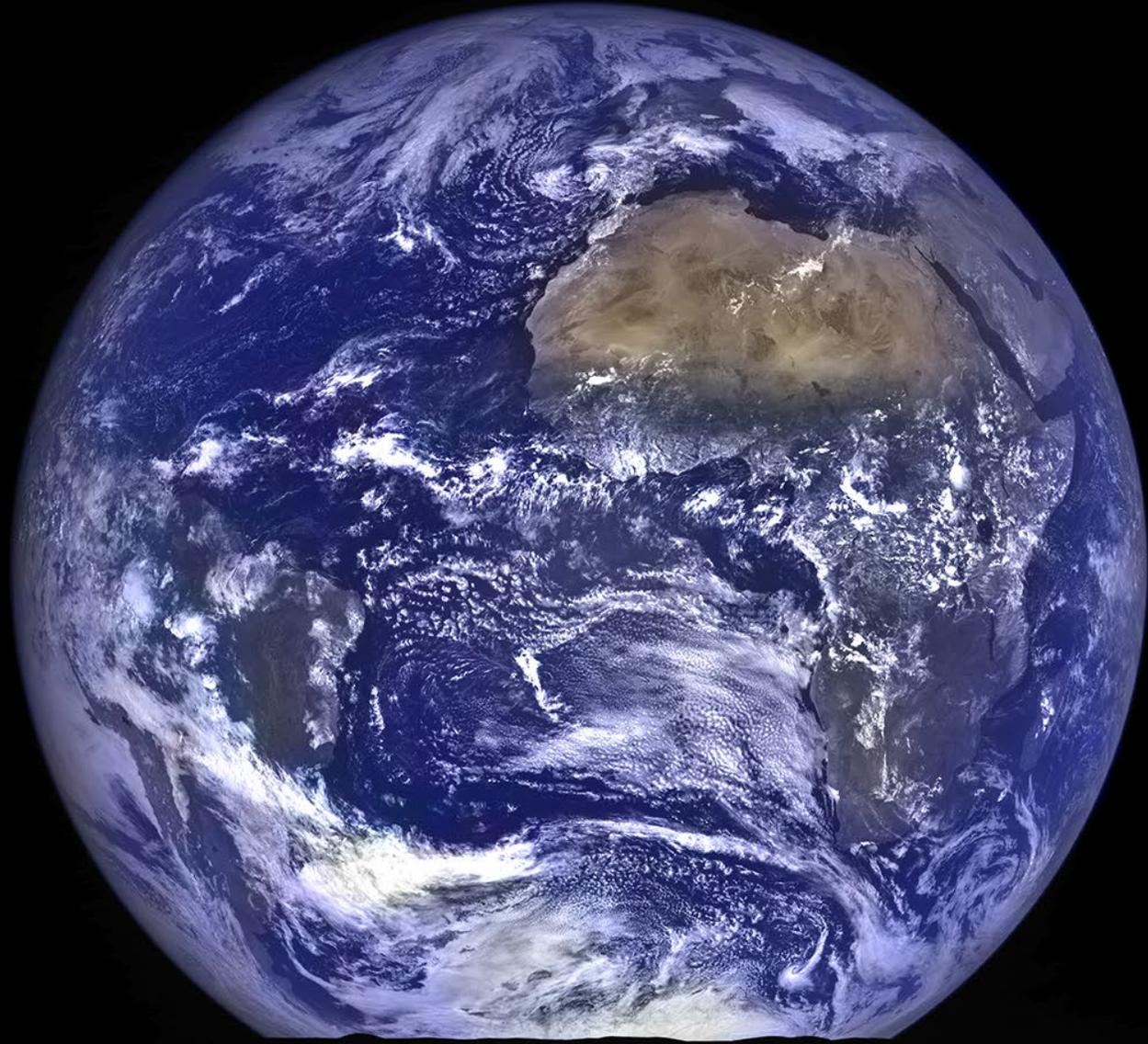
**ARTEMIS**

LRO

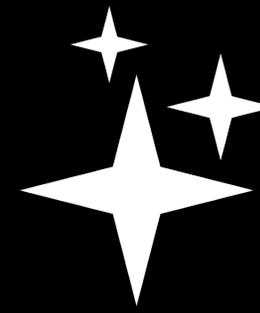
**LDEP**

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

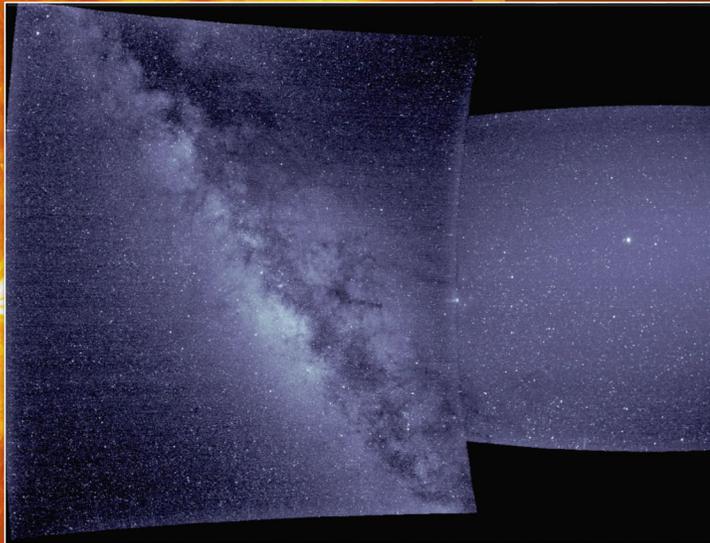
# OPERATING & FUTURE SCIENCE FLEET







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of the Universe



*Sept. 25, 2018 - WISPR instrument on Parker Solar  
Probe shows Earth on the right panel*

# PARKER SOLAR PROBE

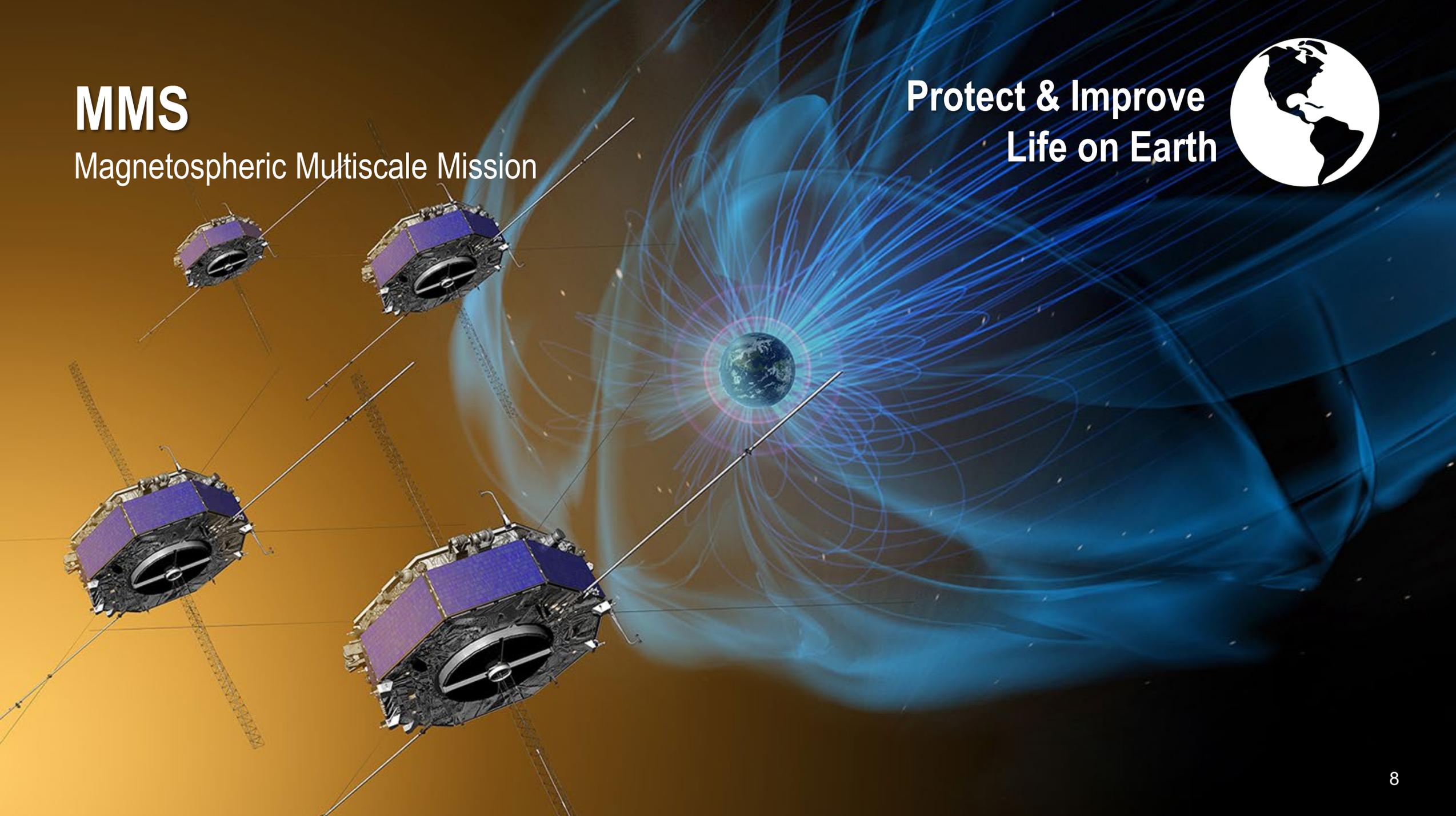
A Mission to Touch the Sun

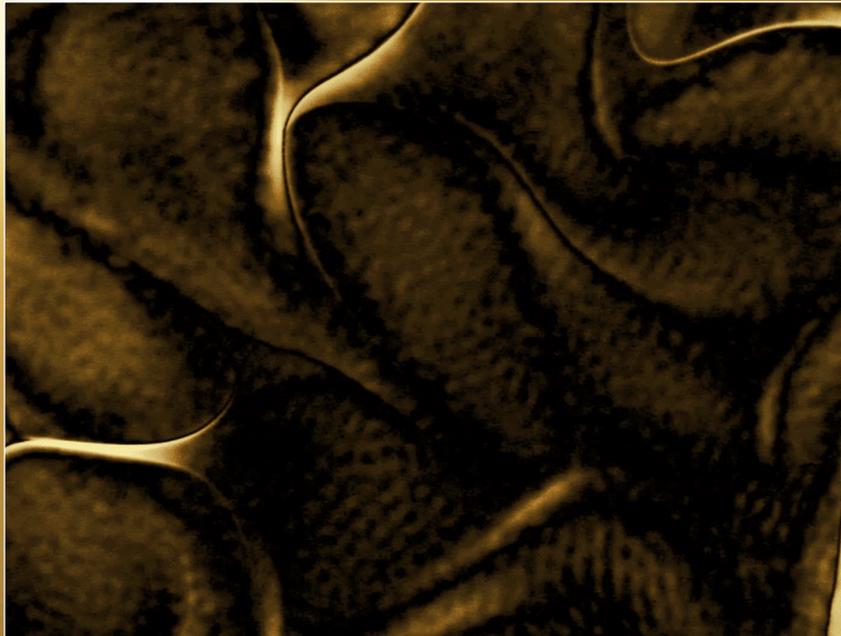


# MMS

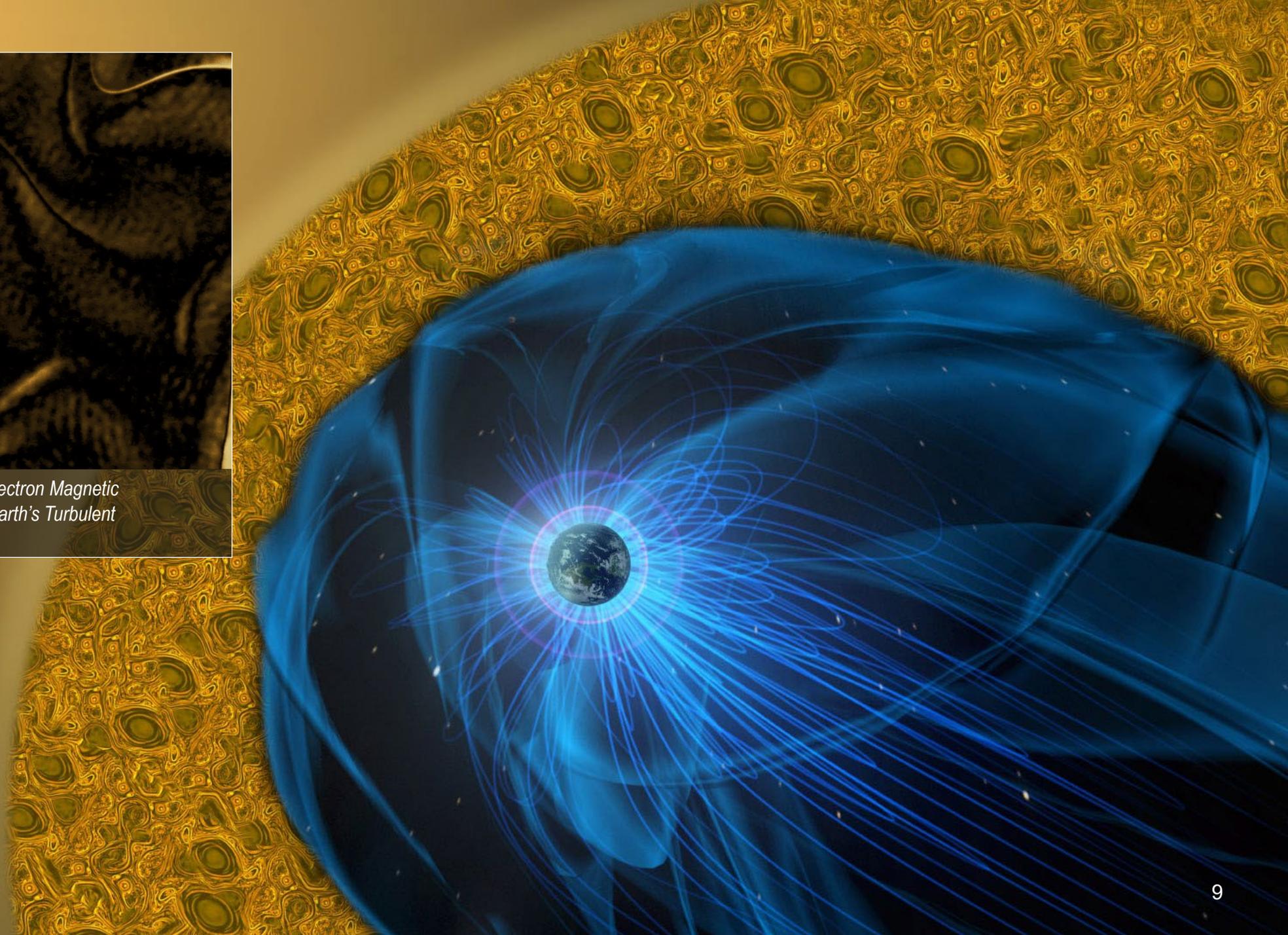
Magnetospheric Multiscale Mission

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Life on Earth





May 9, 2018 – Phan, T. et al., (2018). *Electron Magnetic Reconnection Without Ion Coupling in Earth's Turbulent Magnetosheath*. *Nature*, 557, 202–206



# International Space Station

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[NASA's SDO Reveals How Magnetic Cage on the Sun Stopped Solar Eruption](#)

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[Pulsating Aurora Mysteries Uncovered with Help from NASA's THEMIS Mission](#)

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*4 months ago*

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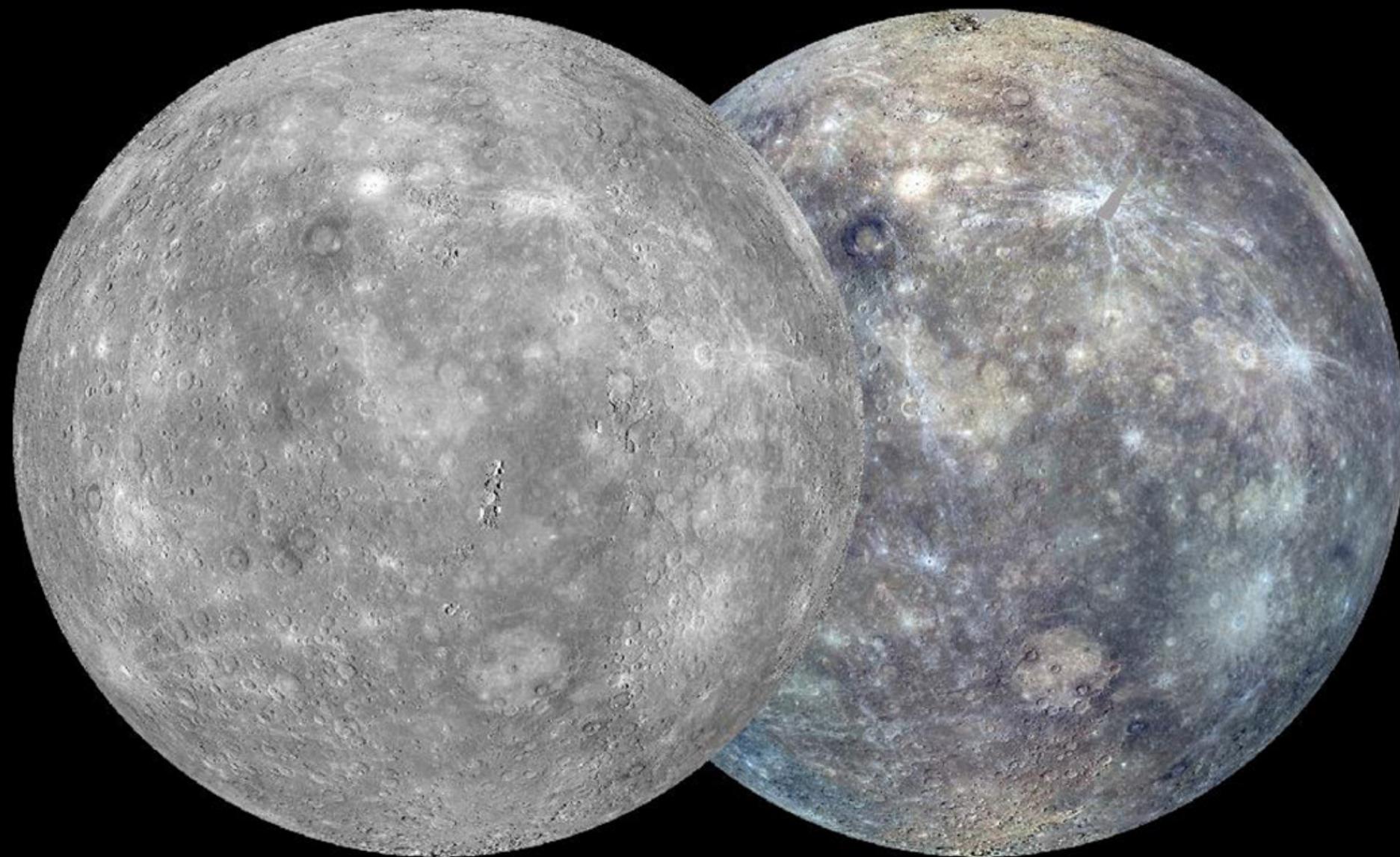
March 14, 2018

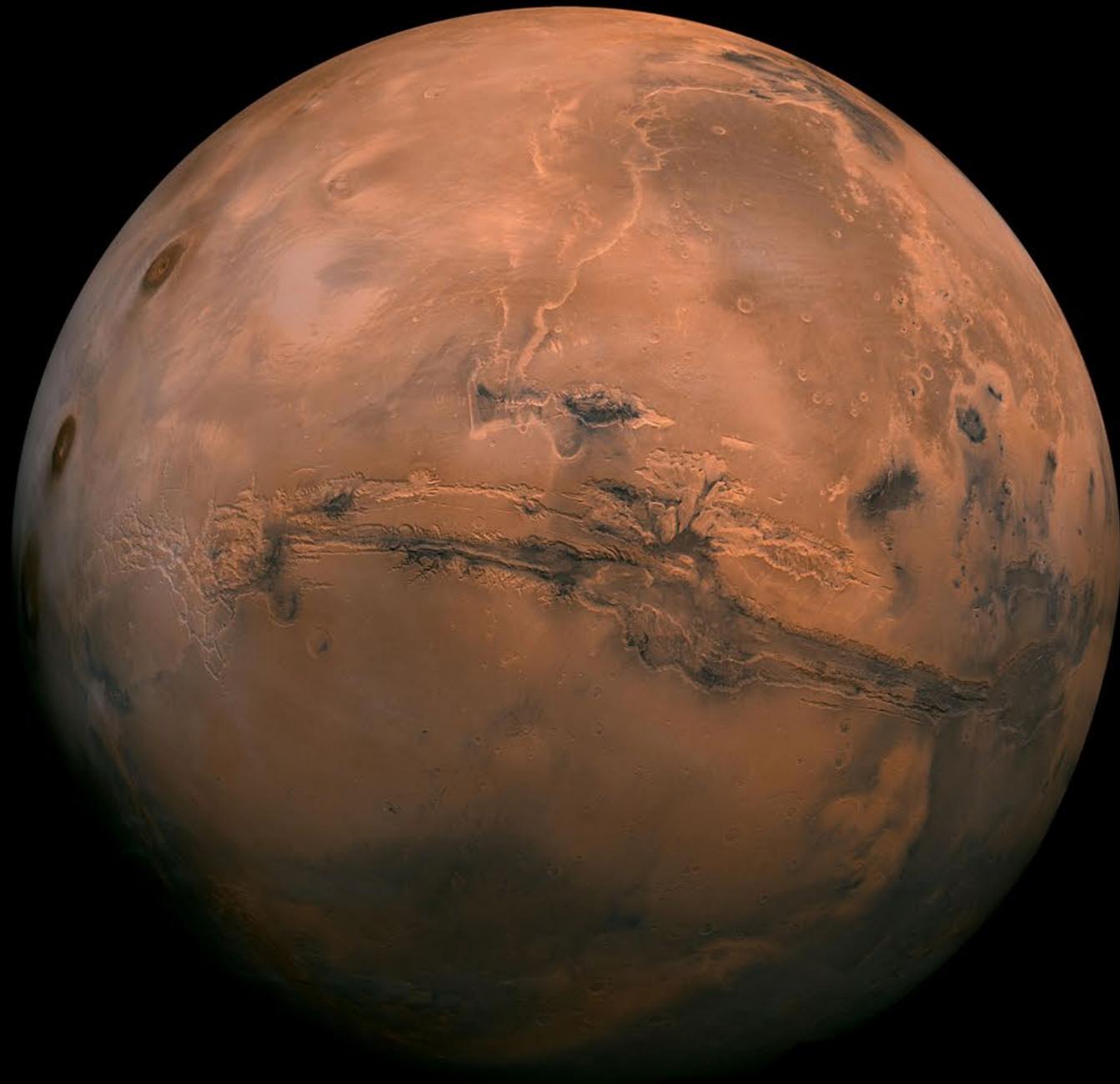
## NASA Needs Your Help to Find Steve and Here's How

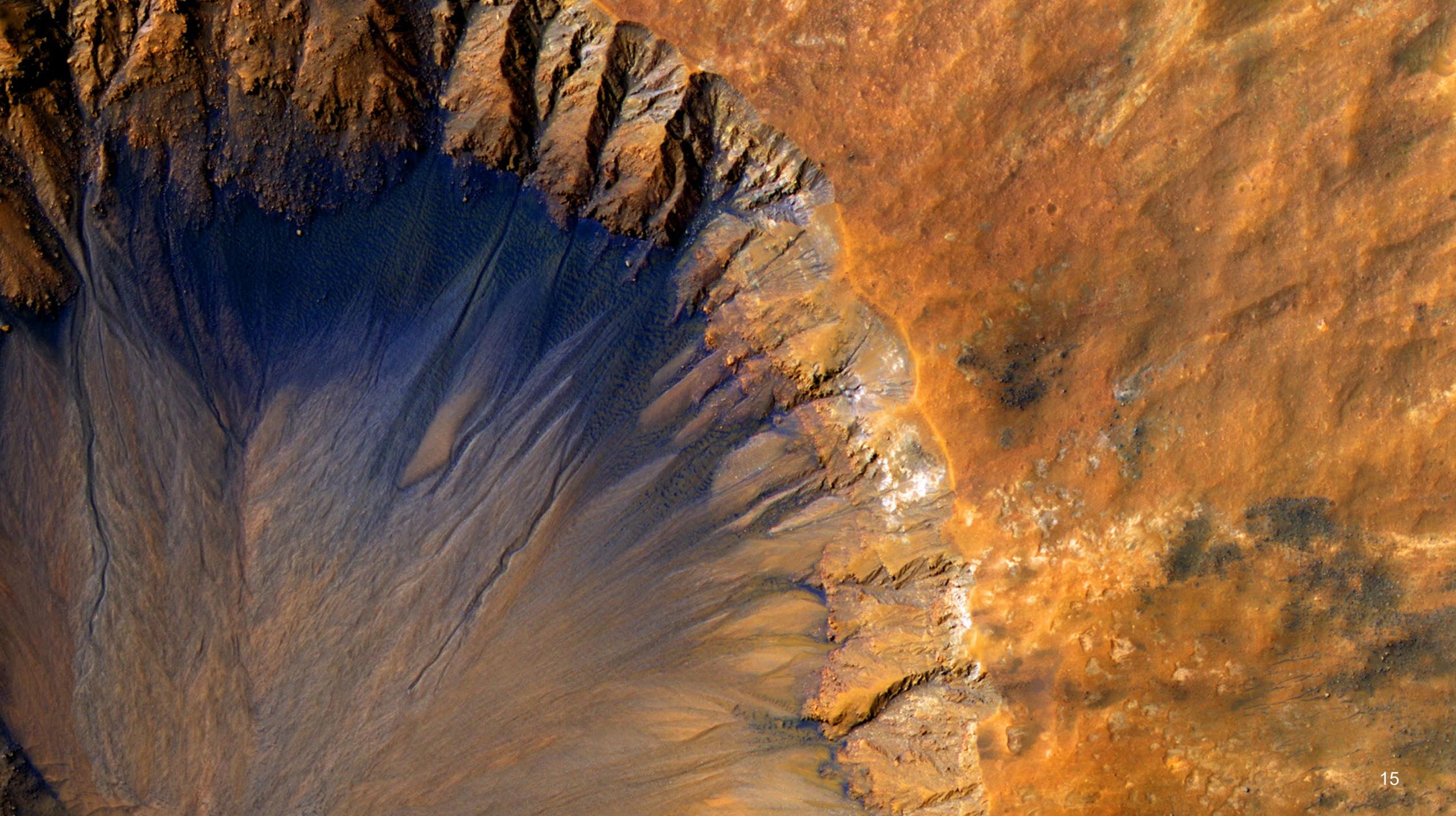


Glowing in mostly purple and green colors, a new celestial phenomenon is sparking the interest of scientists, photographers and astronauts. The display was initially discovered by a group of citizen scientists who took pictures of the unusual lights and playfully named them "Steve." Scientists have since learned more about the purples and greens, and have given it a more accurate name: Strong Thermal Emission Velocity Enhancement, which can still can be shortened to STEVE.



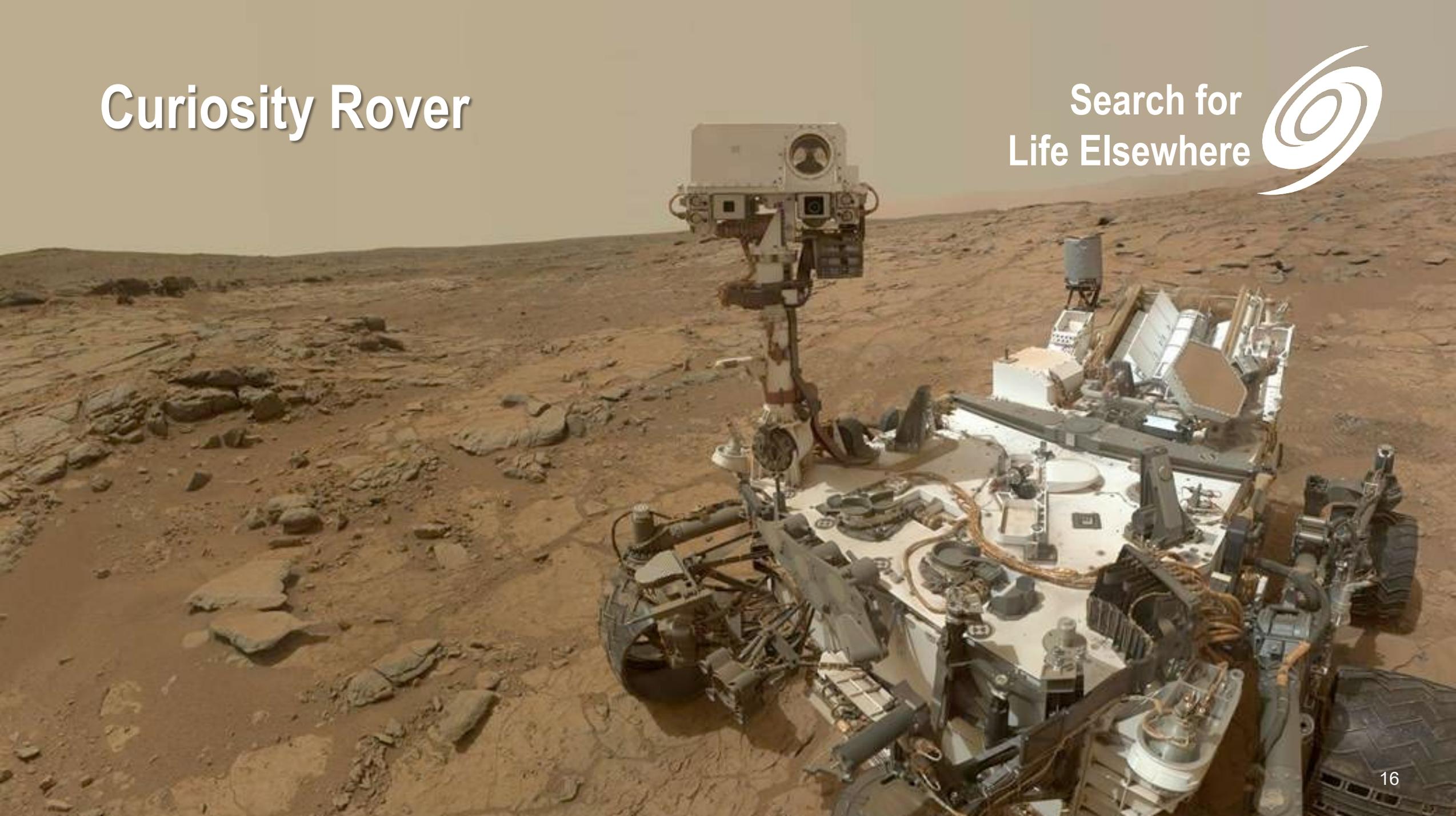






# Curiosity Rover

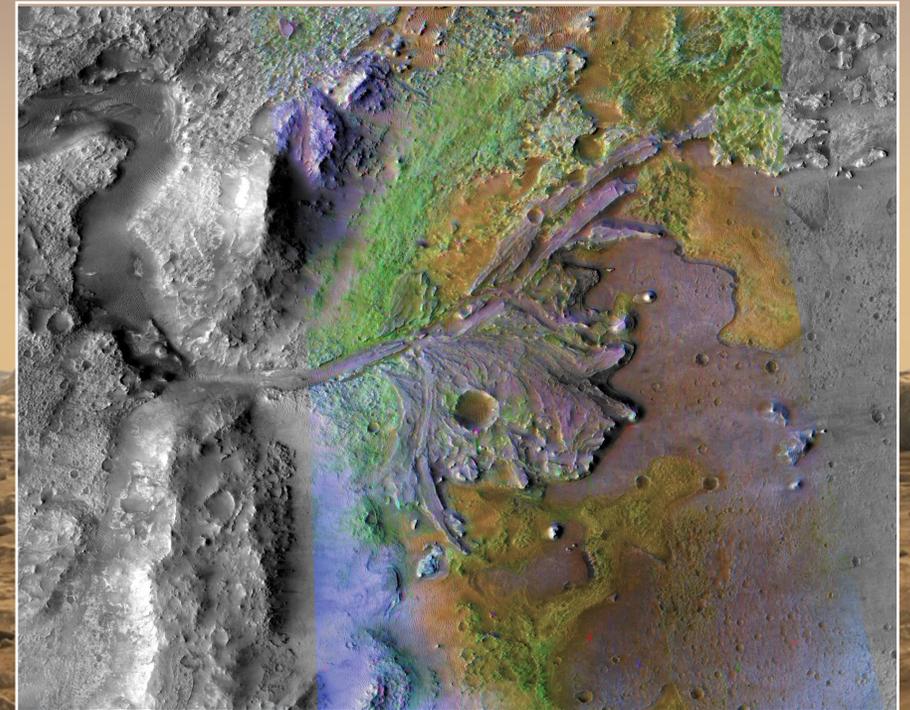
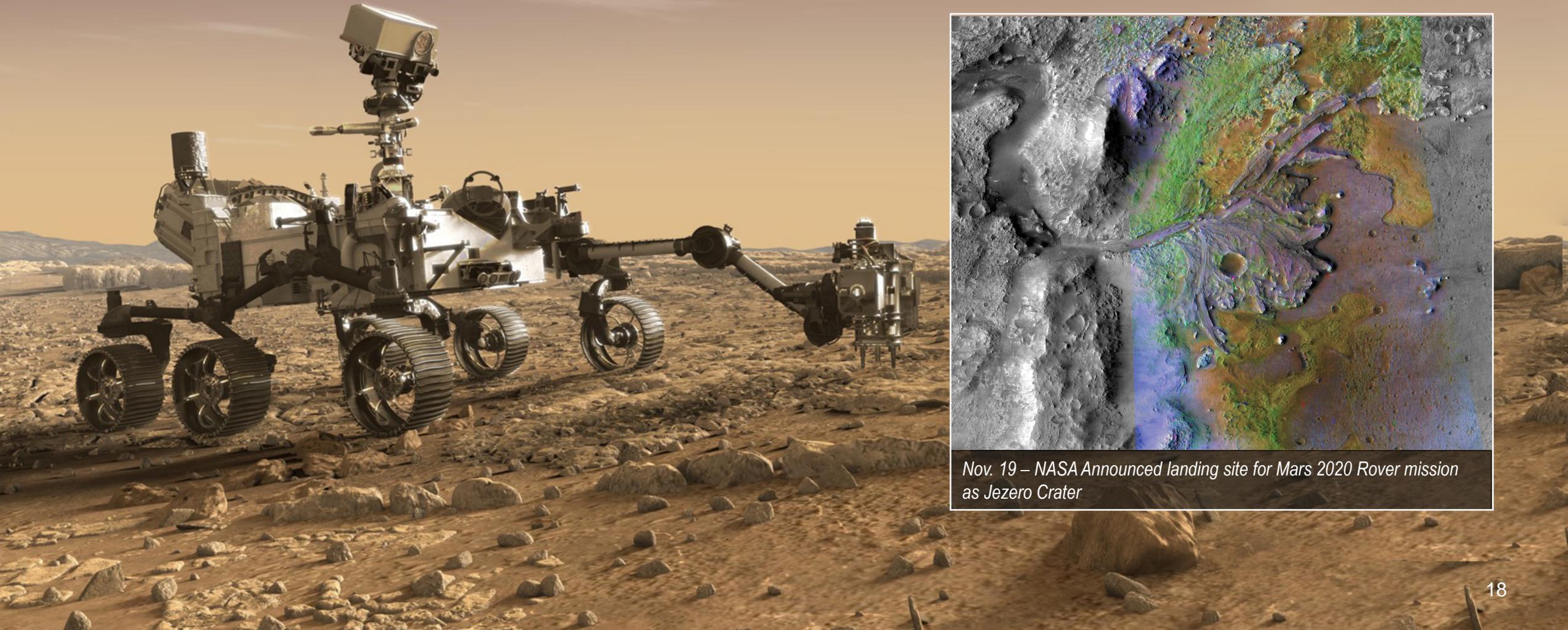
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# Mars 2020

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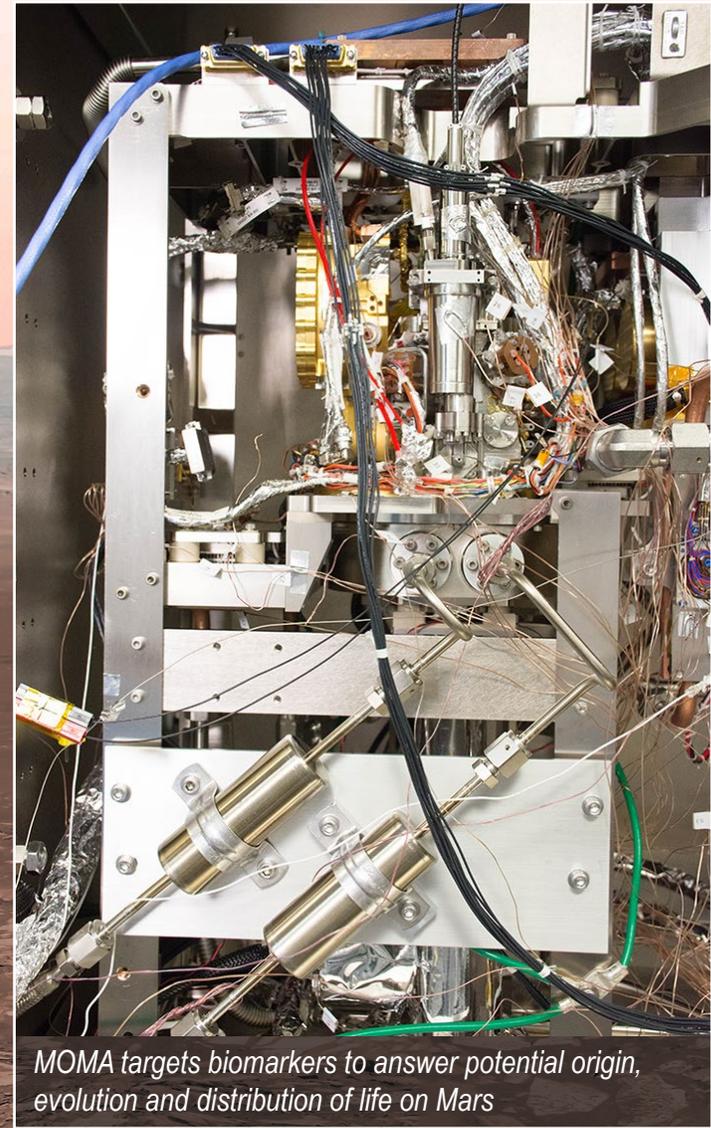


Nov. 19 – NASA Announced landing site for Mars 2020 Rover mission as Jezero Crater

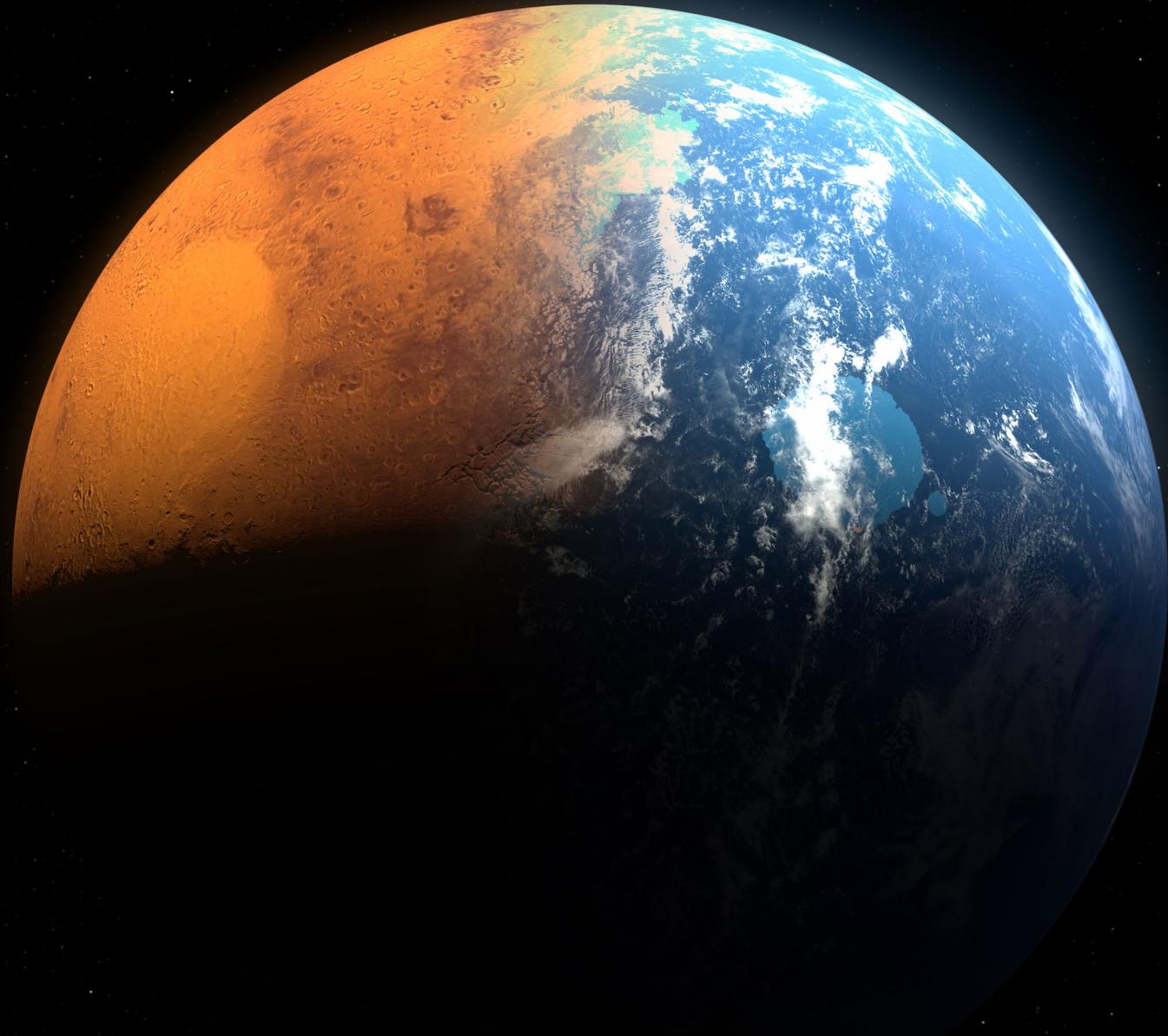


# ExoMars Rover

Mars Organic Molecule Analyzer

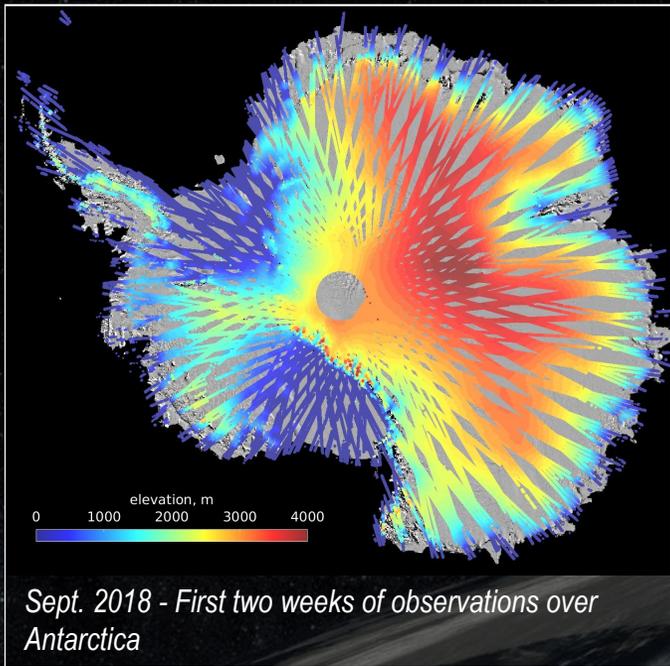
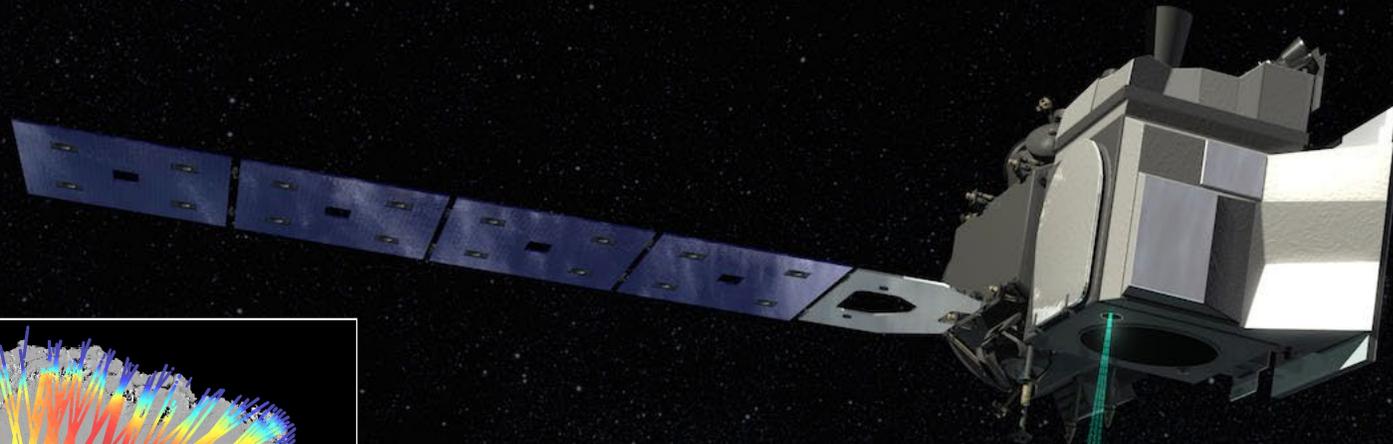


*MOMA targets biomarkers to answer potential origin, evolution and distribution of life on Mars*



# ICESat-2

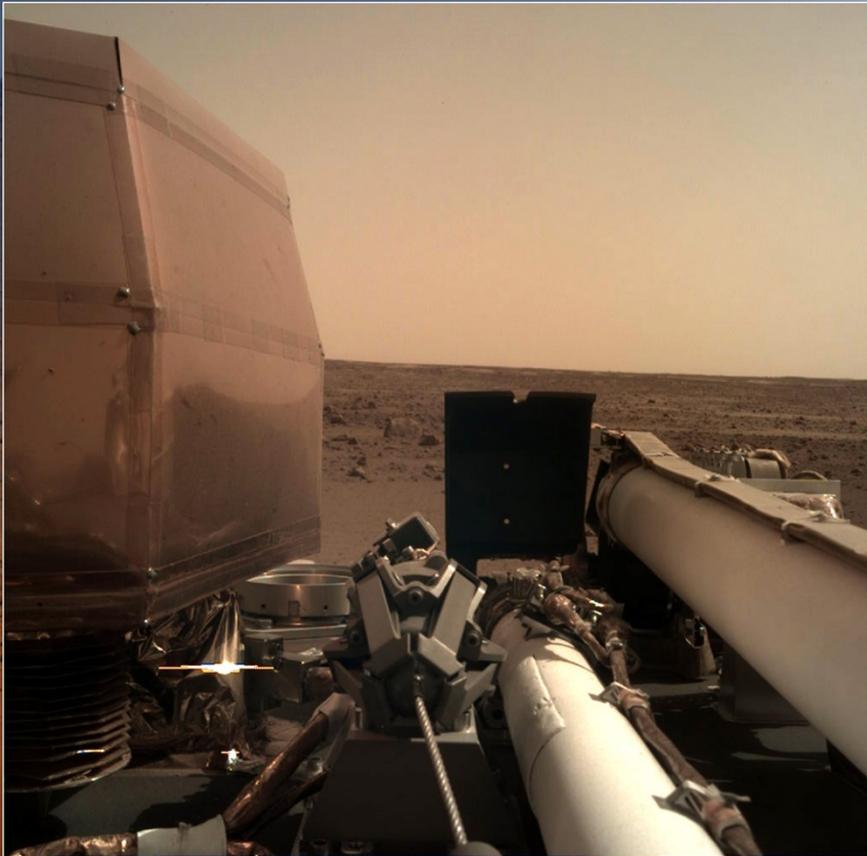
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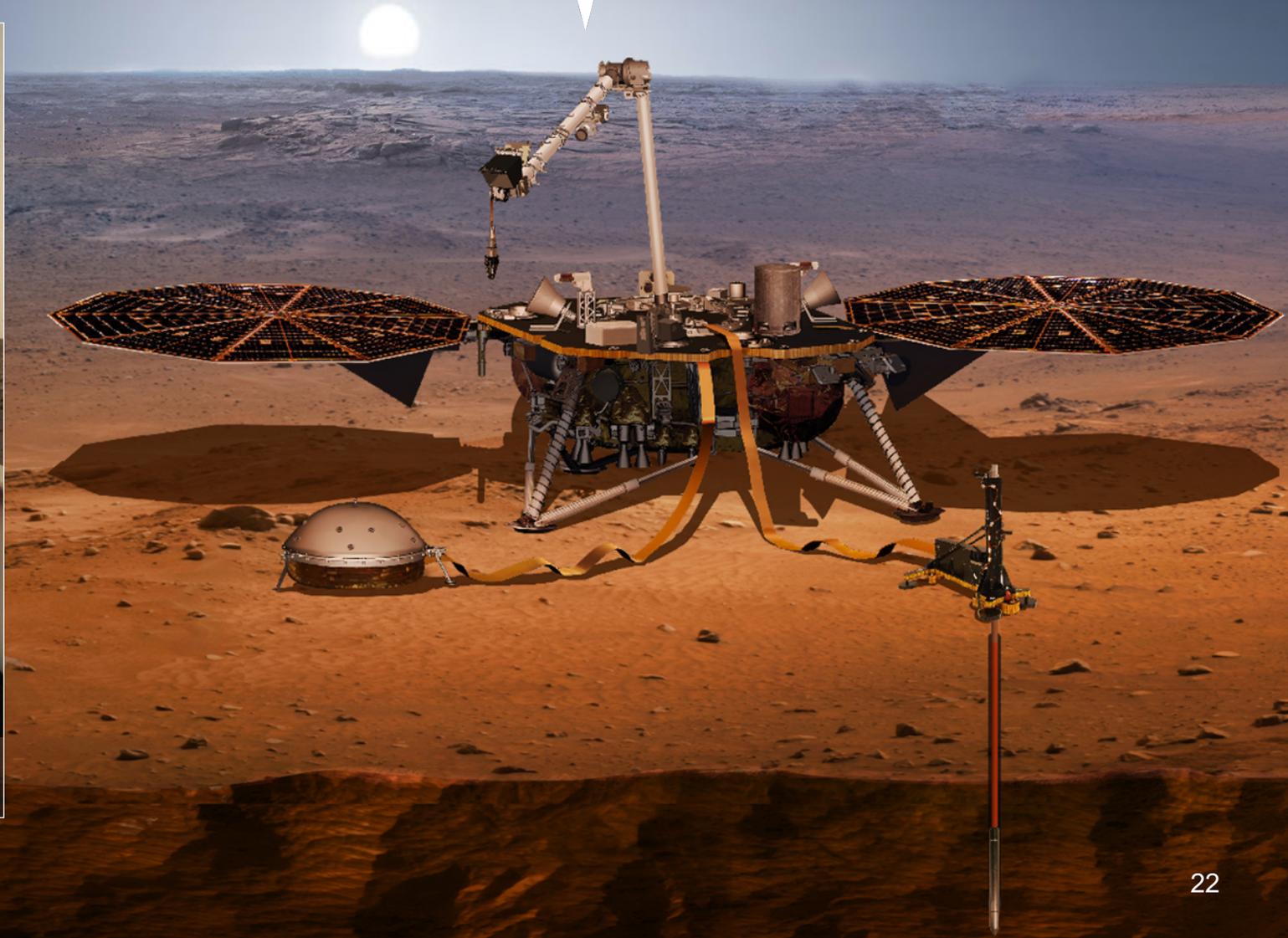
# InSight

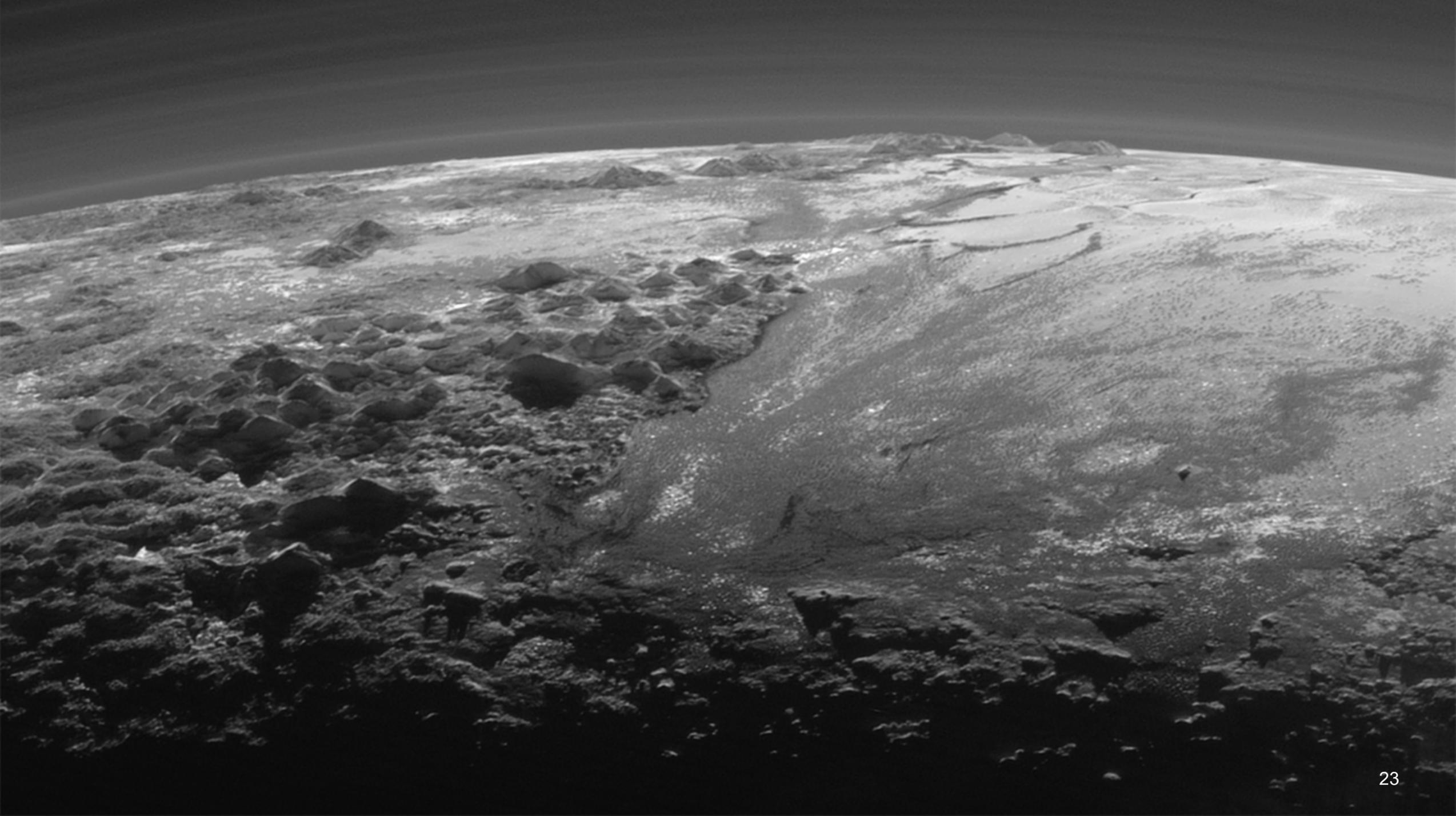


Discover the Secrets  
of the Universe



Nov. 26, 2018 - Surface picture taken by InSight's Instrument Deployment Camera (IDL) on the day of its successful landing on Mars







**Discover the Secrets  
of the Universe**



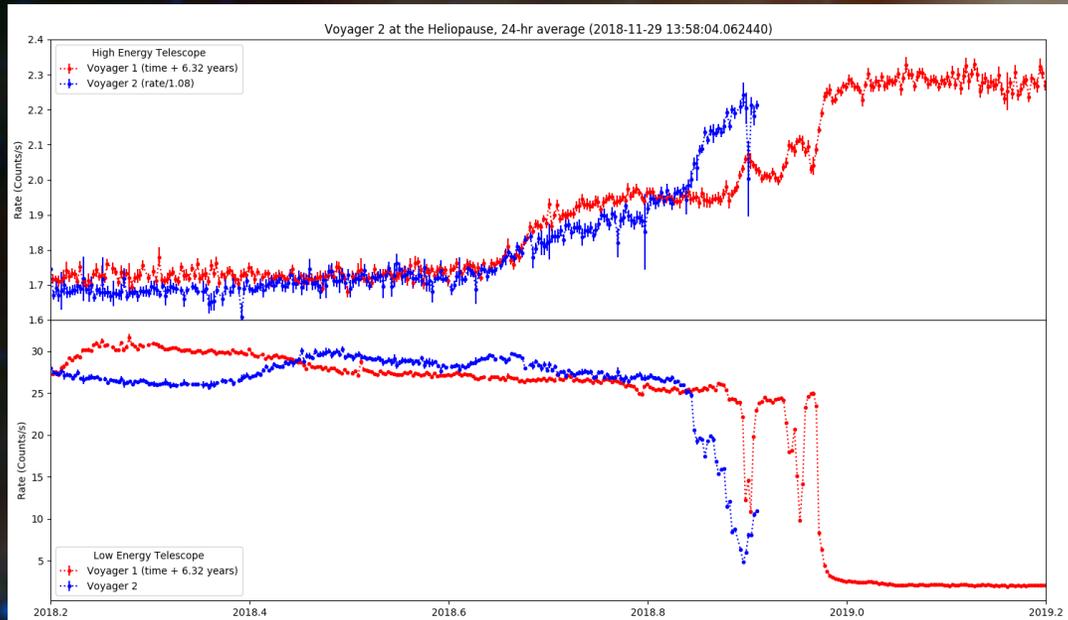
**New Horizons**  
*Arrival at Ultima Thule*  
*January 1, 2019*



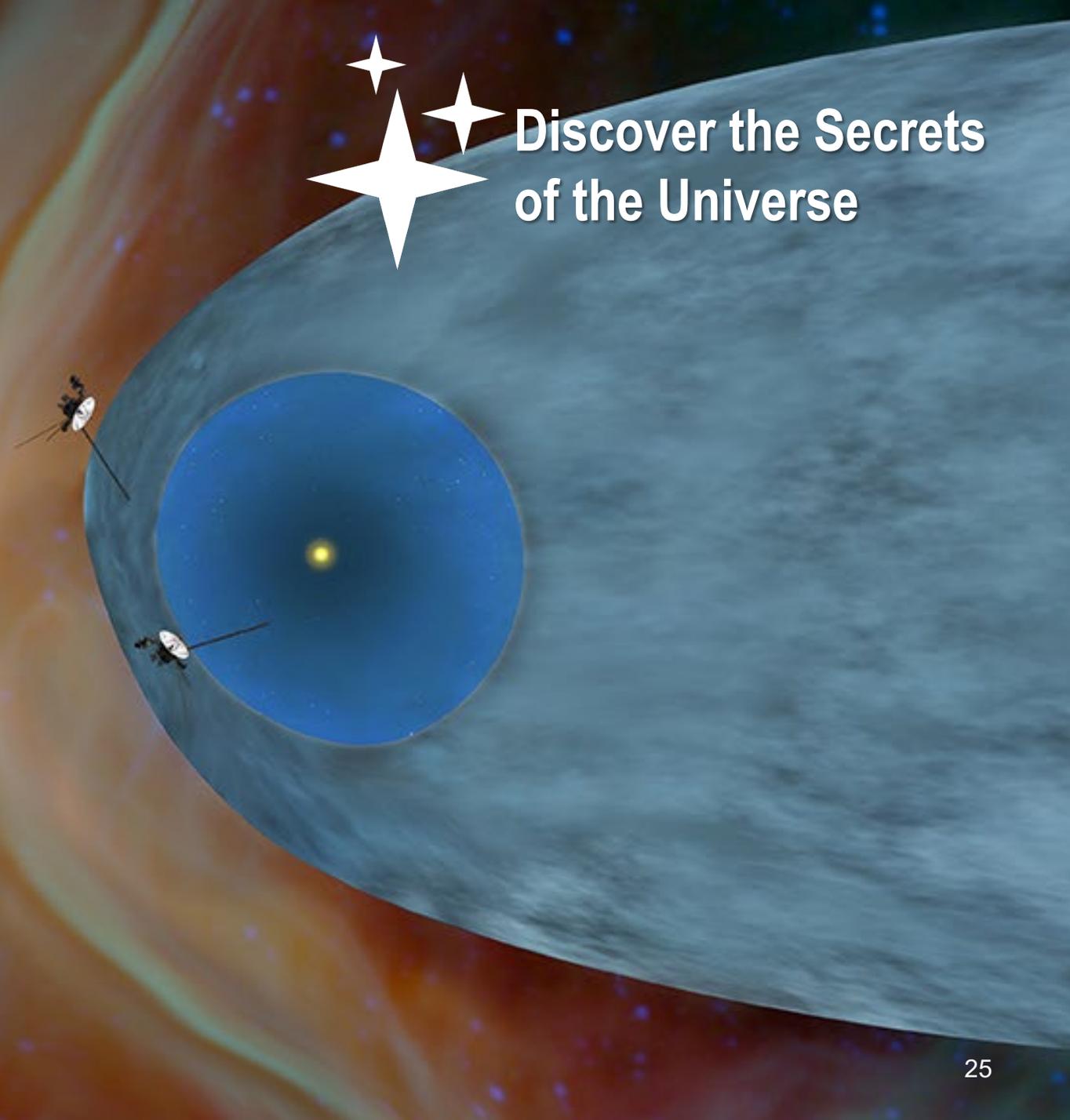
**OSIRIS-Rex**  
*Arrival at Bennu*  
*December 3, 2018*

# Voyager

Discover the Secrets of the Universe



Nov. 29, 2018 - Upper panel shows galactic cosmic ray rates for both Voyager 1 (red, shifted by 6.2 yrs) and Voyager 2 (blue); lower panel shows anomalous cosmic ray rates





exoplanets.nasa.gov  
12/3/2018

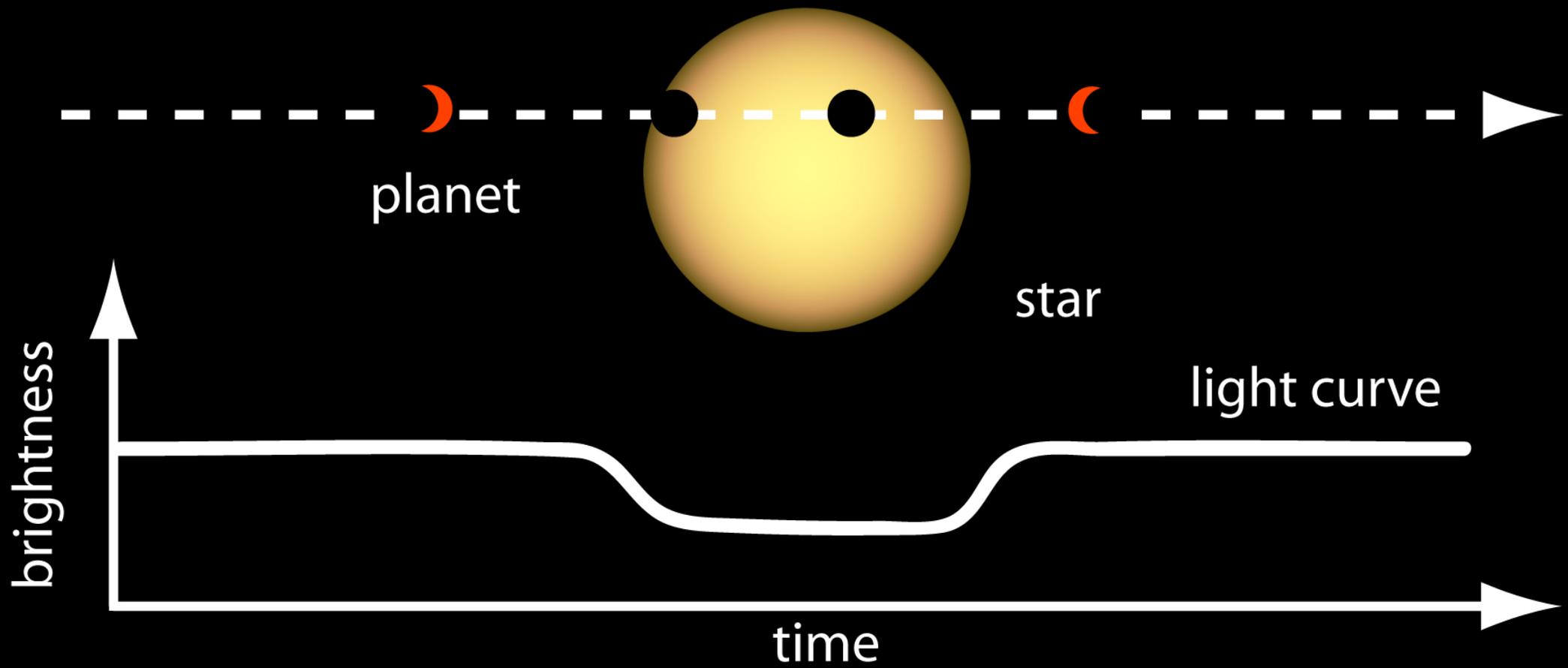
### Discovery Alert! A New Super Earth in the Neighborhood (Six Light-Years Away)

Data from a world-wide array of telescopes revealed Barnard's Star b, a frozen, dimly lit world. The newly discovered planet is the second-closest known exoplanet to the Earth.

[READ MORE](#)

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<b>Exoplanets</b> Last update: December 3, 2018	<b>3,848</b> CONFIRMED	<b>2,899</b> NASA CANDIDATES	<b>2,870</b> PLANETARY SYSTEMS	<a href="#">Glossary ›</a> <a href="#">FAQ ›</a>
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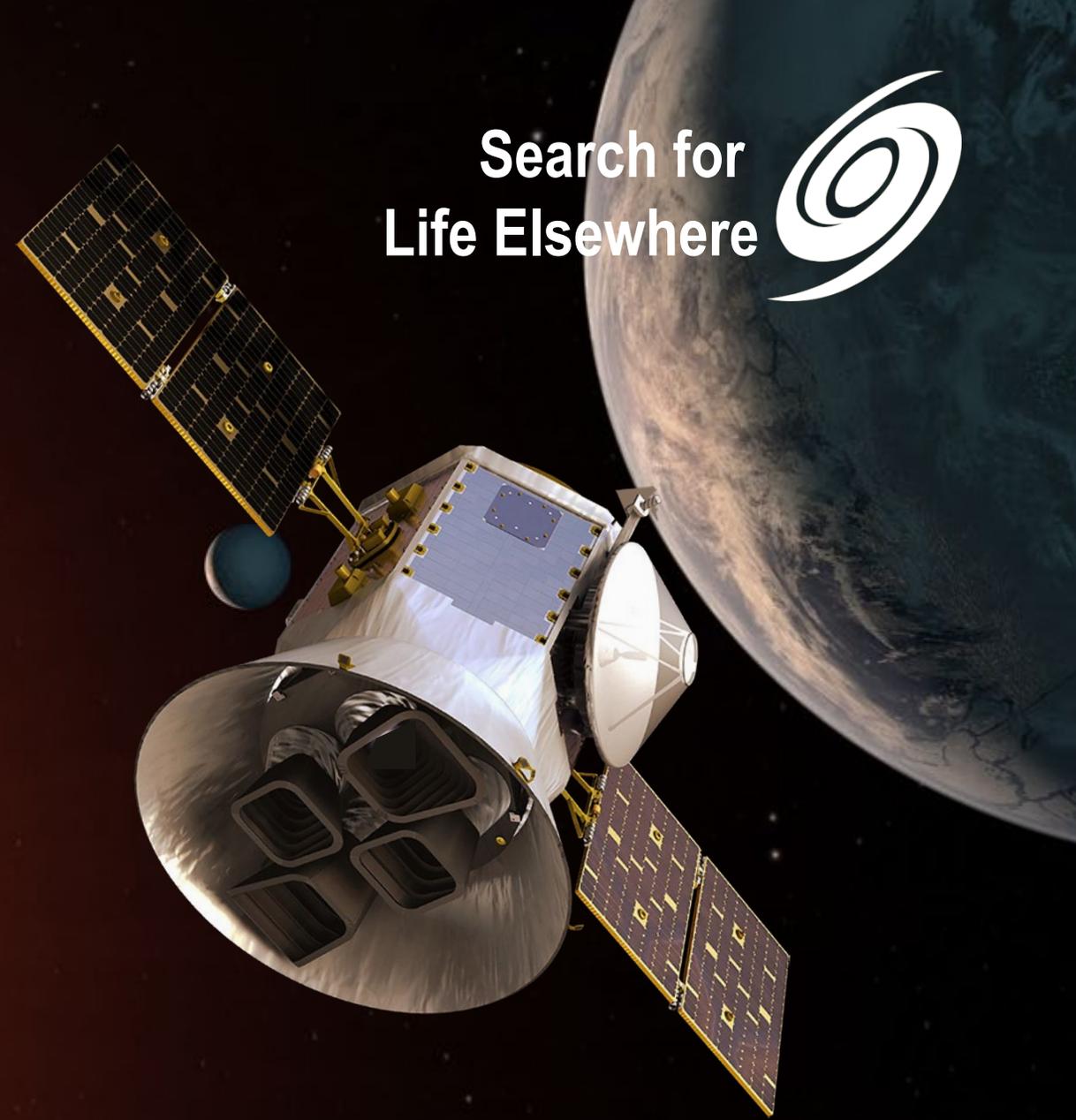
# TESS

Transiting Exoplanet Survey Satellite

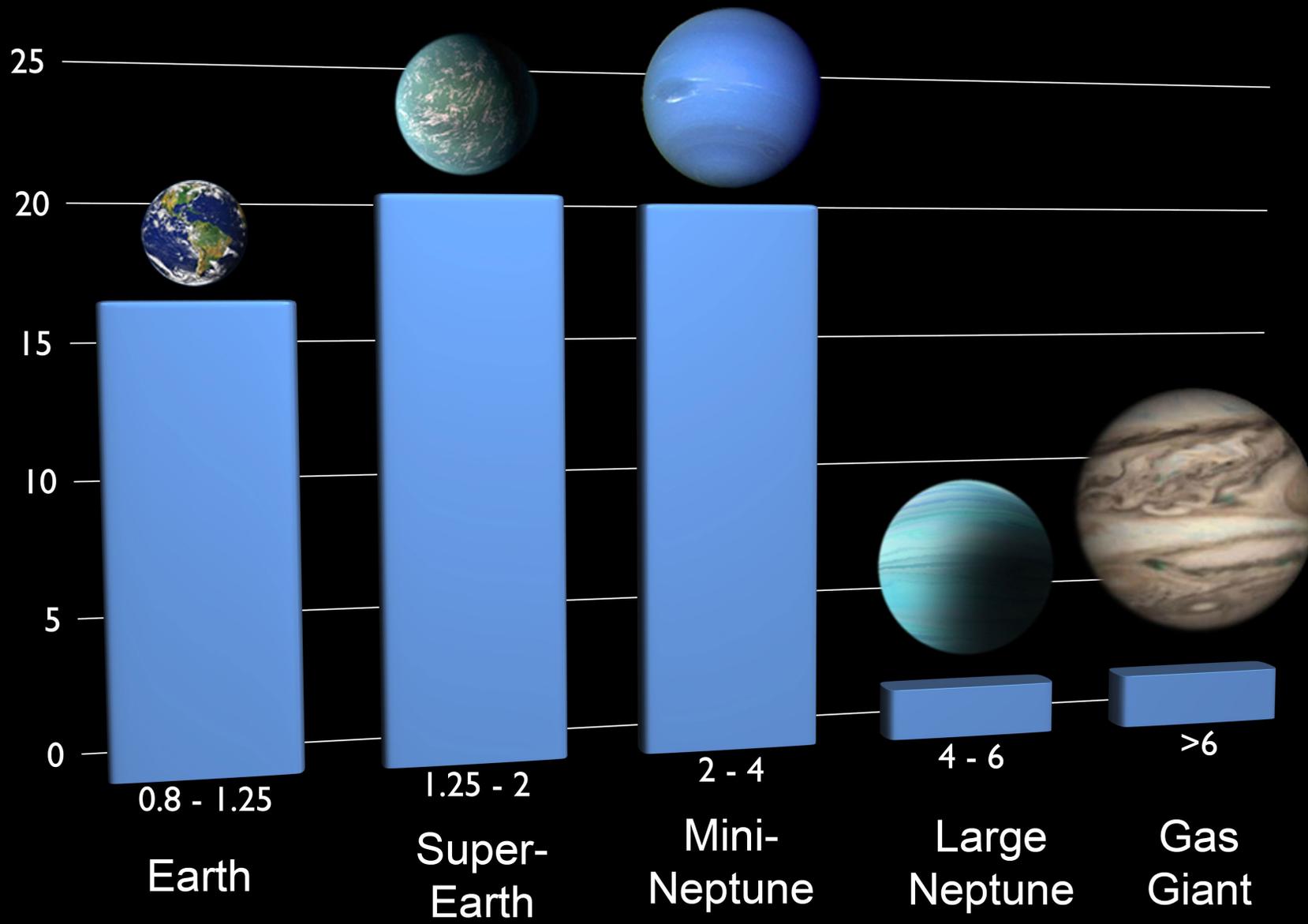
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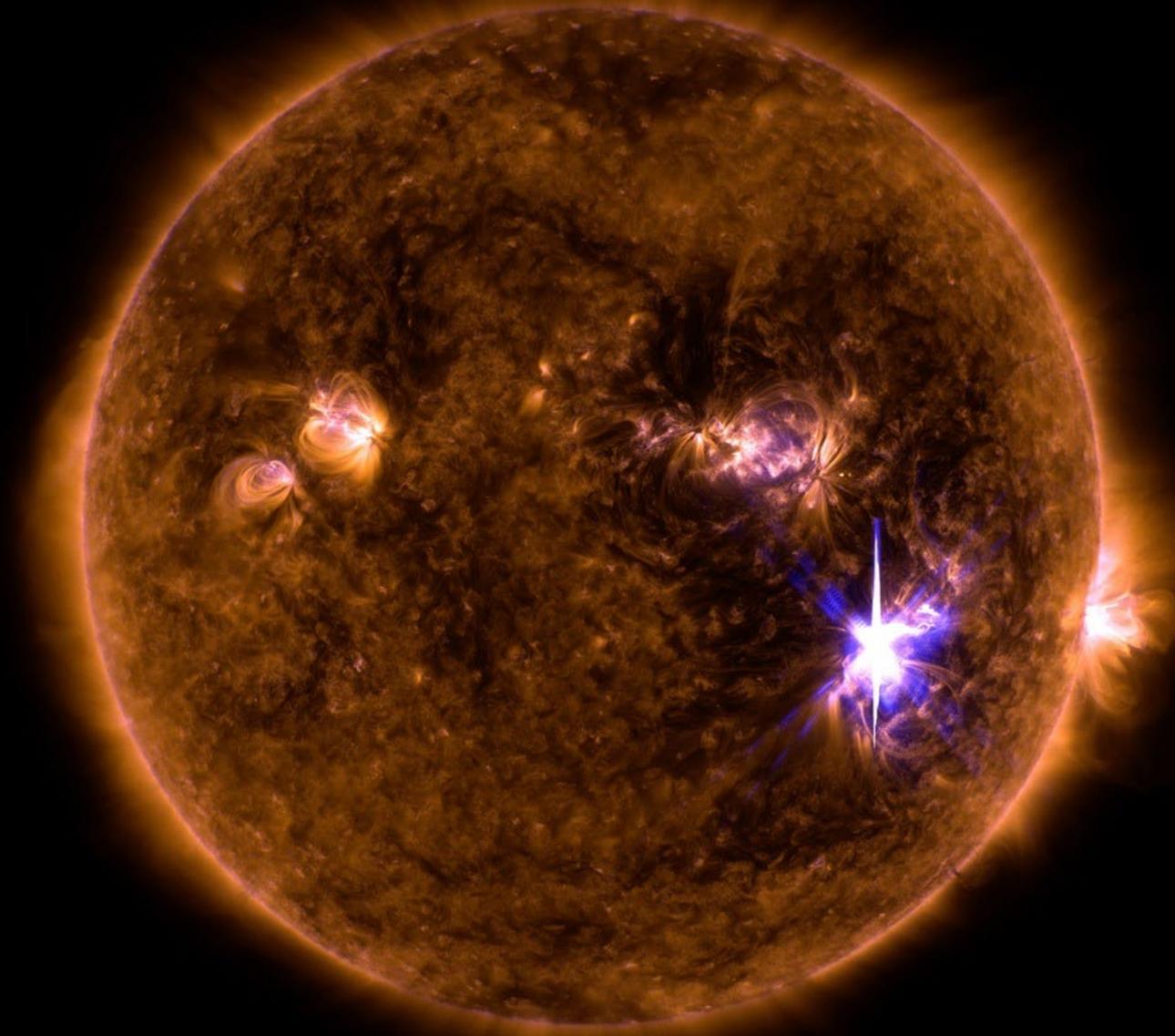
*May 17, 2018 - Test image from one of the four cameras aboard TESS captures a swath of the southern sky along the plane of our galaxy after completing Lunar fly-by*



FRACTION OF STARS WITH AT LEAST ONE PLANET



PLANET SIZE (relative to Earth)







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