



National Aeronautics and  
Space Administration

# The Exoplanet Exploration Program Analysis Group (ExoPAG)

**Shawn Domagal-Goldman**

Acting Director, Astrophysics Division  
NASA Science Mission Directorate



- Aligning with Government-Wide Budget Guidance
  - Emphasize cost-efficiency across mission lifecycles
  - Focus resources on high-impact science
- Balanced Portfolio
  - Sustain diverse set of missions
  - Ensure science return across key themes: origins, exoplanets, and cosmic ecosystems
- Delivering Roman Space Telescope
  - Remain on track with cost and schedule commitments
  - Focus on mission success to enable transformational science in the late 2020s
- Advancing Next-Decadal Priorities
  - Mature key technologies that enable the Habitable Worlds Observatory
  - Position the community for a smooth transition into the next flagship
- Sustain a Robust Research & Analysis Program
  - Strengthen support for the research community, with a focus on early-career scientists
- Expanding Strategic Commercial Partnerships
  - Identify opportunities to partner with industry where appropriate
  - Leverage commercial capabilities to enhance agility and reduce cost

Even in a constrained environment, we're focused on sustaining excellence, empowering discovery, and preparing for what's next.

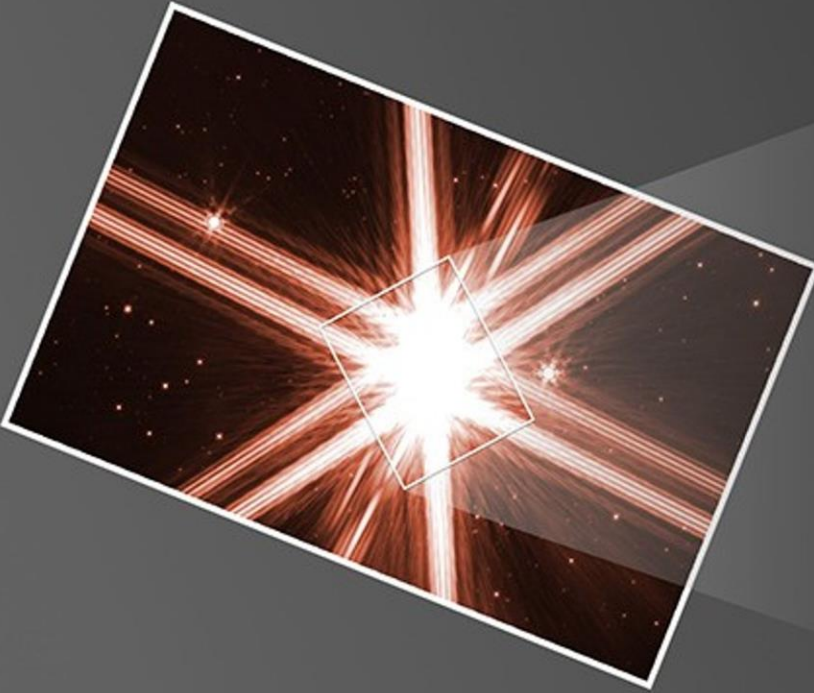
ExoPAG, COPAG, and PhysPAG are  
**HIGHLY VALUED** and will continue.

Names and format are subject to change but the  
interaction points with community are a priority.



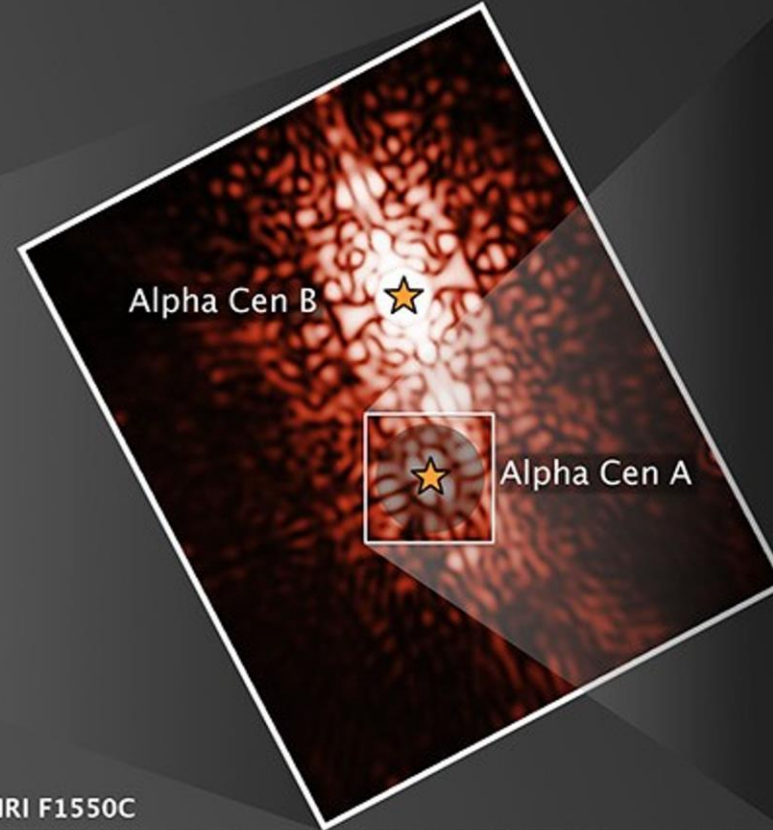
## Potential planet around $\alpha$ Cen A

Binary Star System Alpha Centauri A and B



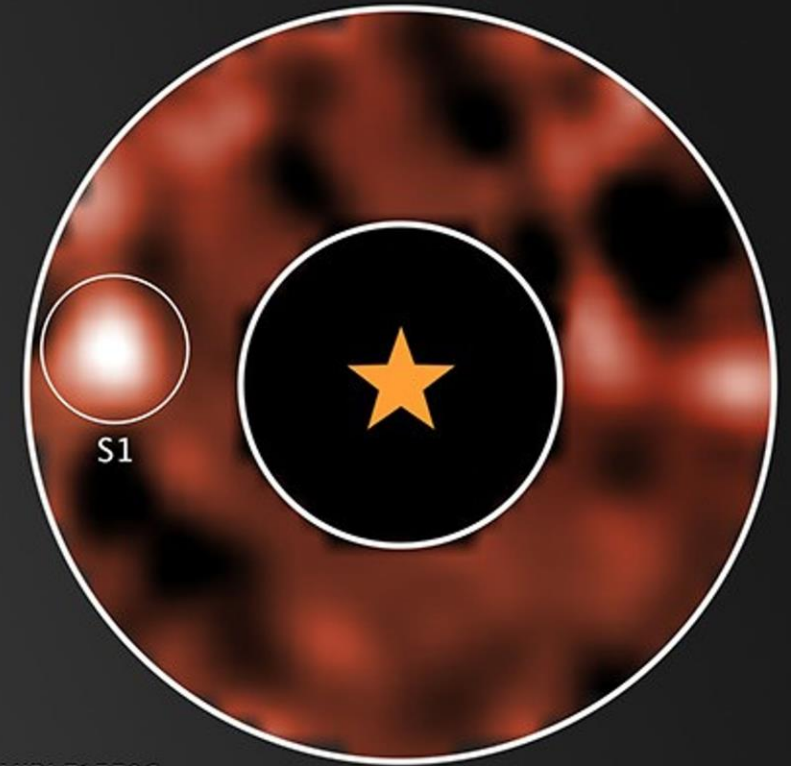
MIRI F1000W

Webb's first image of the binary system, before a light-blocking mask was put in place.



MIRI F1550C

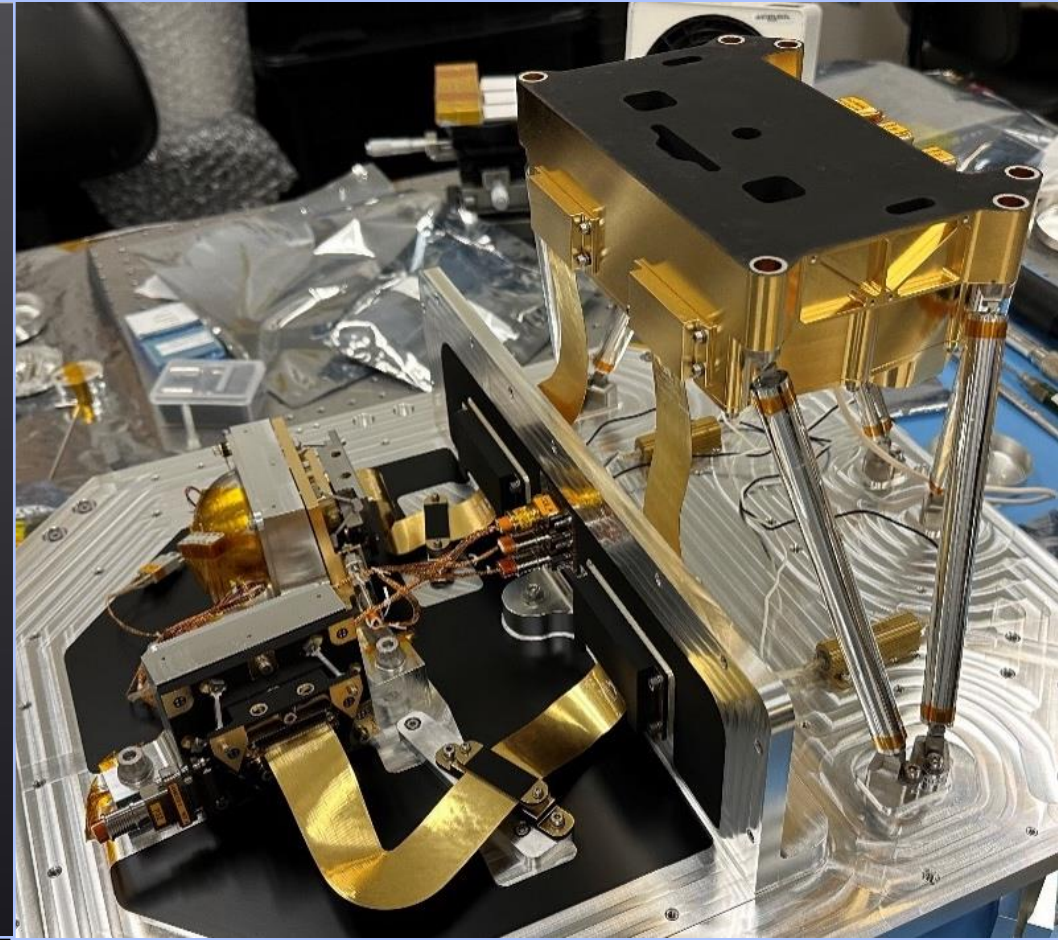
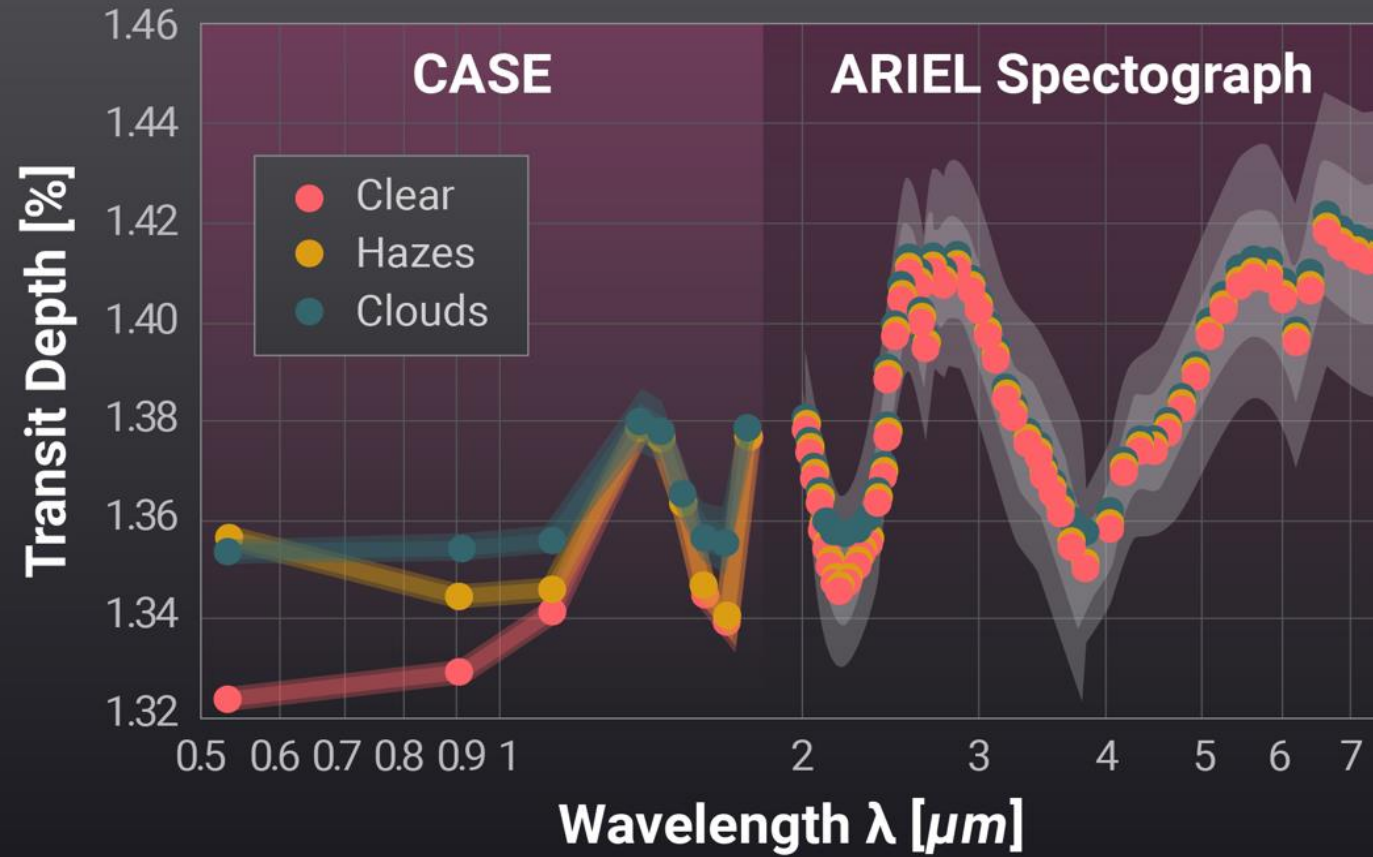
A zoomed-in version with the mask placed over Alpha Centauri A, blocking more than 99 percent of the star's light.



MIRI F1550C

Remaining starlight from both stars subtracted to reveal candidate planet.

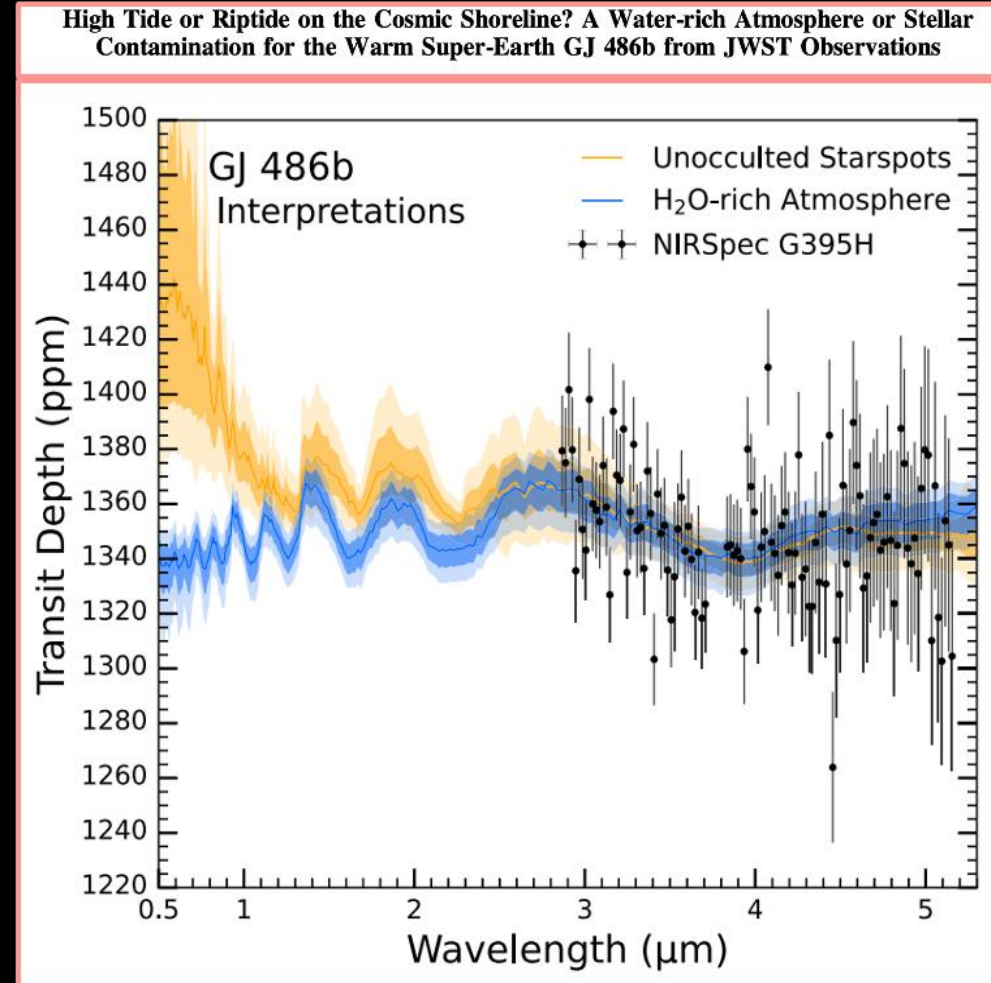
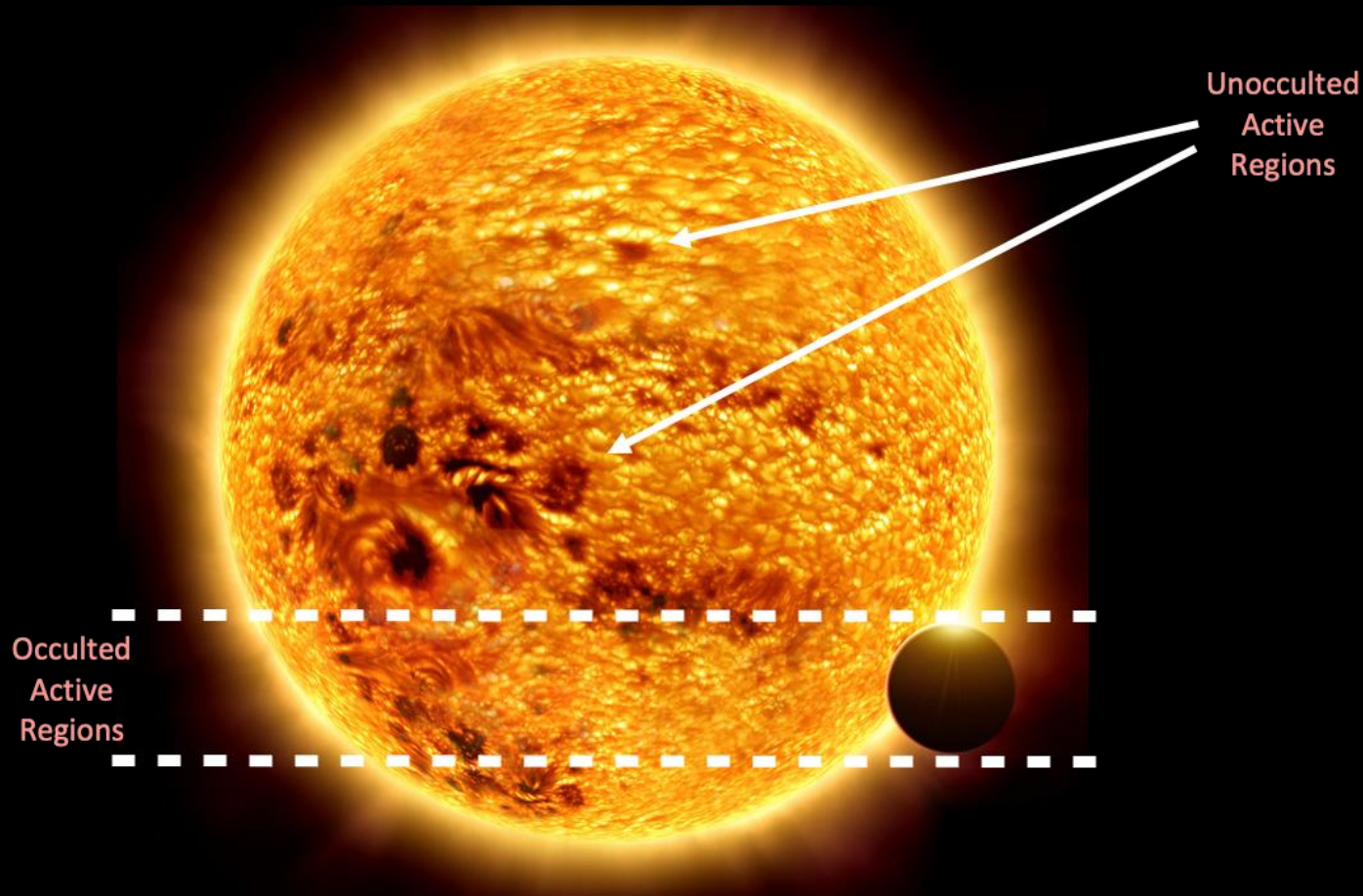
Science: NASA, ESA, CSA, STScI, A. Sanghi (Caltech), C. Beichman (NExScI, NASA/JPL-Caltech), D. Mawet (Caltech); Image Processing: J. DePasquale (STScI)



Hardware delivered October 2024  
Launch date: December 2029



Pandora will address the timely problem of stellar contamination in exoplanet transmission spectroscopy.





The HWO25 Conference in Washington DC was a huge success!

HWO25 | JULY 28 – 31, 2025

*Towards the*

H A B I T A B L E   W O R L D S  
O B S E R V A T O R Y

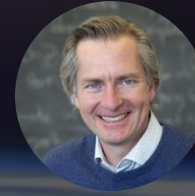
VISIONARY SCIENCE AND TRANSFORMATIONAL TECHNOLOGY





# Community Science & Instrument Team (CSIT)

H A B I T A B L E  
W O R L D S  
O B S E R V A T O R Y



David Charbonneau,  
Co-chair  
Harvard



Evgenya Shkolnik,  
Co-chair  
ASU



Michael Bottom  
U. Hawaii



Eric Burns  
LSU



Richard Cartwright  
JHU - APL



Ewan Douglas  
U. Arizona



Kevin France  
LASP/CU Boulder



Scott Gaudi  
Ohio State



Rebecca Jensen-Clem  
UCSC



Janice Lee  
STScI



Victoria Meadows  
U. Washington



Chris Packham  
UT San Antonio



Laurent Pueyo  
STScI



Tyler Robinson  
U. Arizona



Jason Tumlinson  
STScI

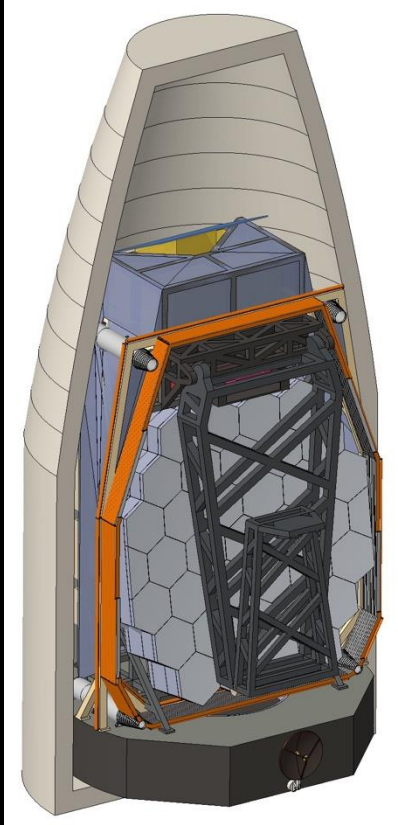
International ex-officio members to be added soon



# Habitable Worlds Observatory

## PRELIMINARY DESCRIPTIONS AND VERY PRELIMINARY CONCEPTS

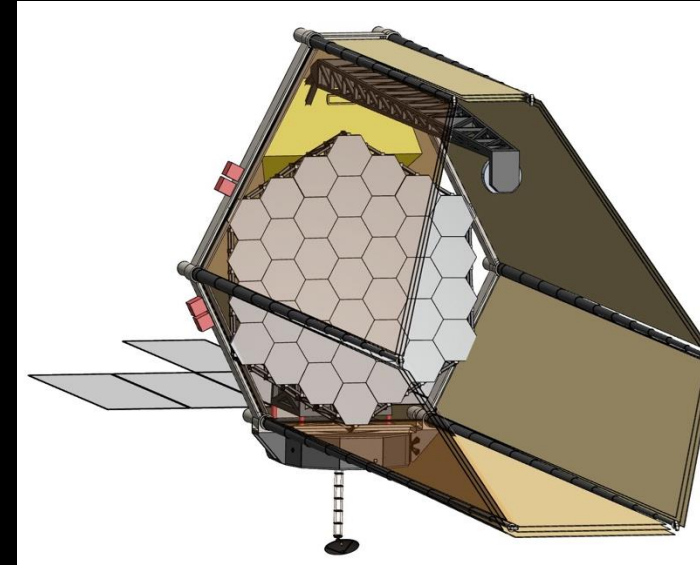
### EAC4



- Off axis, >6.5m
- Volume dual rocket compatible
- 5 instruments w/UV IFU
- 2 channel Vis+NIR Coronagraph



### EAC5

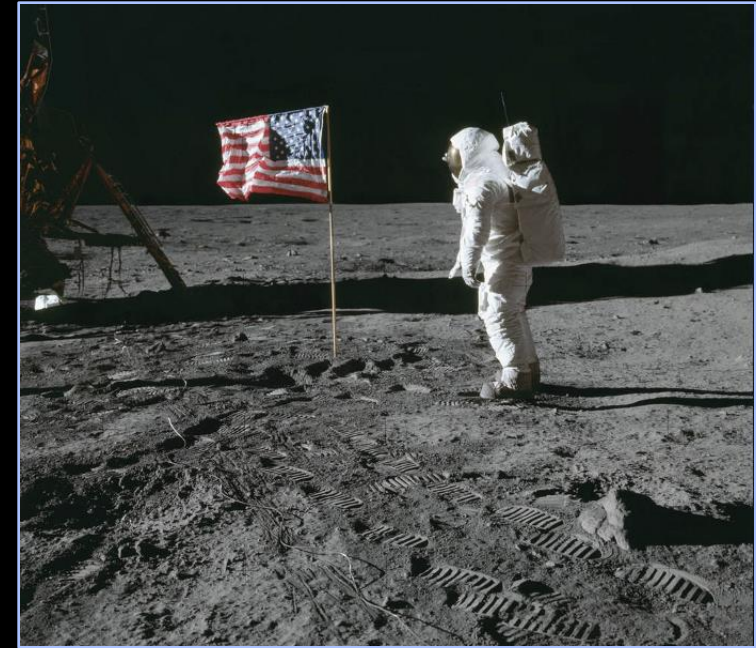


- Off axis, >8m (8.3m ID/10m OD)
- Volume dual rocket compatible
- 5 instruments w/UV IFU
- 3 channel Vis/Vis+NIR coronagraph

# Habitable Worlds Observatory

## Looking Ahead

Developing the advanced technologies to search for life and explore the cosmos benefits our nation and is the next giant leap for HWO.



**NASA ROSES 2024** - Several proposals “selectable” that strive for TRL-5

HWO System Technology Demonstrations and Mission Architecture Studies

NNH24ZDA001N-HWOTAS



# Habitable Worlds Observatory

Stay involved with the HWO Science Interest Group!



- Provide input to the HWO project
- Define HWO science questions and analyses
- Be part of an international community supporting HWO

Organized by the NASA Astrophysics Program Offices and Program Analysis Groups, the HWO Science Interest Group (SIG) will connect the community to HWO.

## Leadership Team

### ExoPAG

- Jessie Christiansen (IPAC/NExSci)
- Laura Mayorga (JHU/APL)

### COPAG

- Joe Burchett (New Mexico State University)
- Vivian U (IPAC)

### PhysPAG

- Fabio Pacucci (CfA)
- Richard Massey (Durham Univ)

Appendix	ROSES-2025 Program Element	Abbreviation	DAPR?	Lead Program Officer
D.1	Astrophysics Research Program Overview			R. Ojha
D.2	Astrophysics Data Analysis	ADAP	DAPR	J. Pepper
D.3	Astrophysics GO/GI Programs	AGIGO	DAPR	S. Immler
D.4	Theoretical and Computational Astrophysics Networks	TCAN		S. Vahidinia
D.5	Astrophysics Pioneers	Pioneers	DAPR	M. Garcia
F. 3	Exoplanets Research Program	XRP	DAPR	J. Wisniewski
F.5	FINESST	FINESST	DAPR	A. Cucchiara
F.9	Citizen Science Seed Funding Program	CSSFP	DAPR	H. Hassan



- Due to the compressed time schedule of ROSES-25 and budget uncertainties, as well as the anticipated release of ROSES-26 in Feb next year, ROSES-25 has a small number of solicitations consistent with the strategic goals of the Astrophysics Division and in alignment with the 2020 Decadal Survey and Administration priorities.
- All the General Observer/General Investigator program elements have been consolidated into a single solicitation in D.3 AGIGO.
- Proposers at other federal agencies planning to receive funding from NASA through Interagency Agreements (IAAs) must get approval from their POC before submitting their proposal. Proposals for amounts under \$100K are exempt.

- All the General Observer/General Investigator program elements have been combined into a single solicitation in D.3 AGIGO.
- This Astrophysics General Investigator General Observer (AGIGO) program combines what were previously separate program elements for the Swift, Fermi, Nuclear Spectroscopic Telescope Array (NuSTAR), Transiting Exoplanet Survey Satellite (TESS), Neutron Star Interior Composition Explorer (NICER), Imaging X-ray Polarimetry Explorer (IXPE) and the X-ray Imaging and Spectroscopy Mission (XRISM) observatories.
- Program Elements do not share the same due dates. See Tables 2 and 3 of ROSES.
- On June 17, 2025, NICER science operations were suspended due to a hardware anomaly in the pointing system. A rich data analysis opportunity remains, see Section 6.

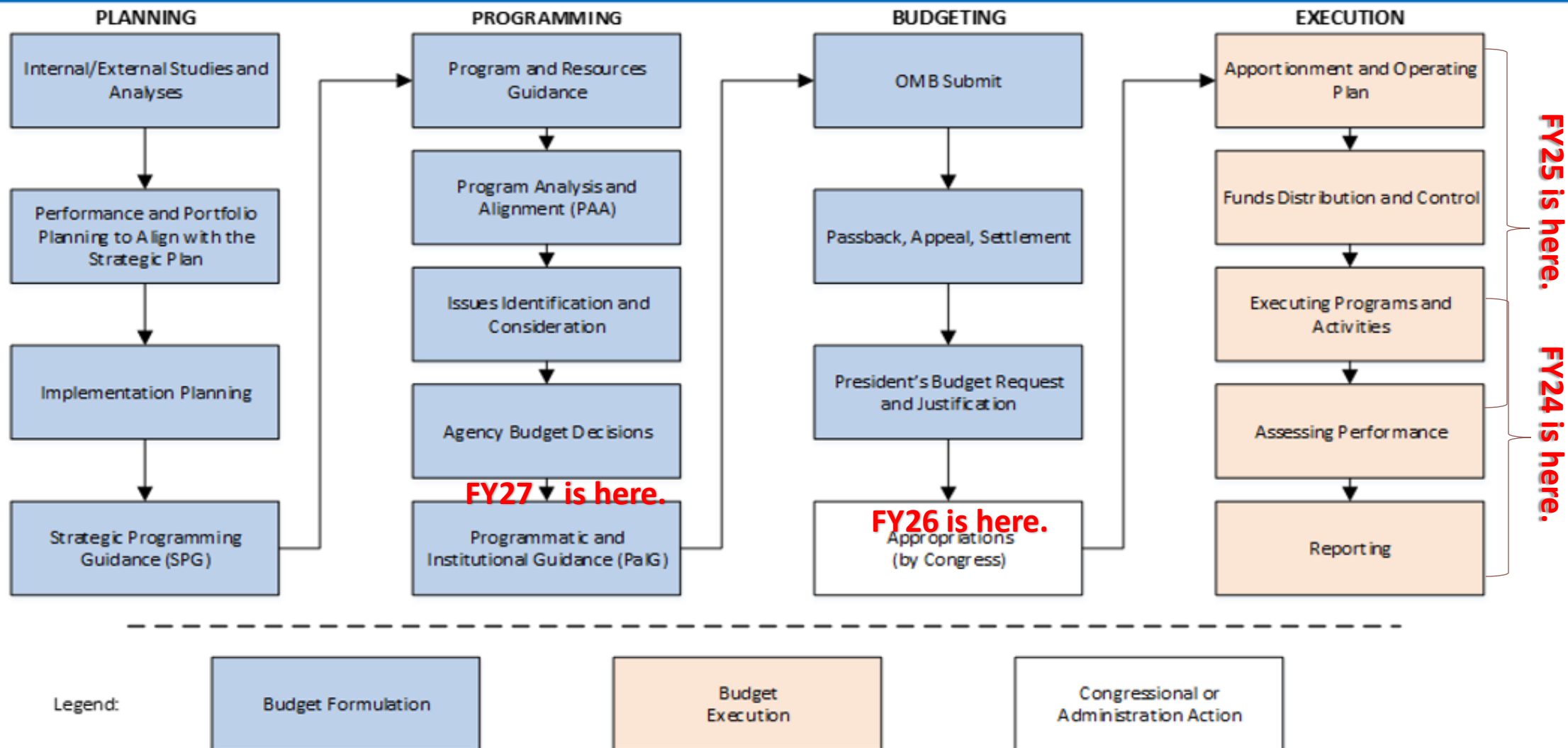


## Budget Management Overview

National Aeronautics and Space Administration  
Office of the Chief Financial Officer



Slide 40



- The Senior Review of Operating Missions is a triennial assessment of NASA Astrophysics missions that have submitted proposals for extended operations beyond their prime phase. The 2025 Review considered proposals from
  - Chandra X-ray Observatory (Chandra)
  - Fermi Gamma-ray Space Telescope (Fermi)
  - Hubble Space Telescope (HST)
  - Imaging X-ray Polarimetry Explorer (IXPE)
  - Neil Gehrels Swift Observatory (Swift)
  - Nuclear Spectroscopic Telescope Array (NuSTAR)
  - Transiting Exoplanet Survey Satellite (TESS)
  - X-ray Multi-Mirror Mission-Newton (XMM-Newton, an ESA mission)
- The Neutron Star Interior Composition Explorer (NICER) on ISS was not reviewed because it was under repair. The NICER Light Leak Repair was conducted during Extra-Vehicular Activity from ISS in January 2025.
- The Review report was released in June 2025 along with NASA's response at [2025-senior-review-of-operating-missions](#)
  - The Report emphasizes that “each mission ... continues to be capable of producing important, impactful science in a cost-effective manner and would do so if allowed to continue operations into the next extended mission cycle.”
  - Every mission received the highest possible rating for potential of scientific return in the three-year period of FY2026 through FY2028, and all show strong alignment with the scientific goals of the community and NASA SMD.
  - Under the President's Budget Request for Fiscal Year 2026, NASA expects to continue at least five of these eight missions.



## Worlds Beyond: Exoplanet Task Force Report

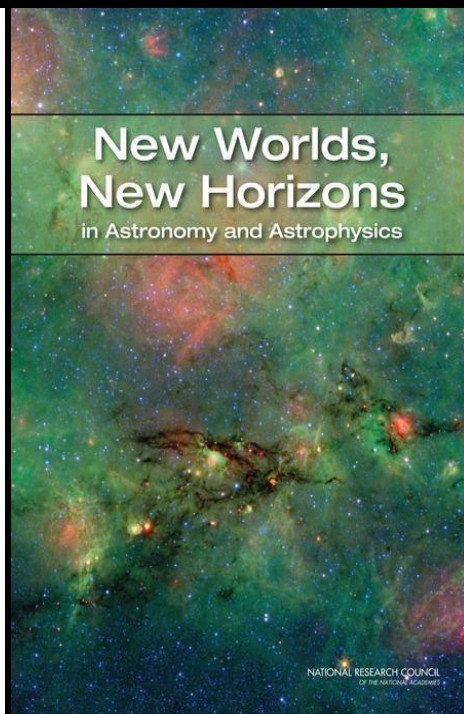
2008

Worlds Beyond: A Strategy for the Detection and  
Characterization of Exoplanets  
Report of the ExoPlanet Task Force  
Astronomy and Astrophysics Advisory Committee

Washington, D.C.  
May 22, 2008

## Astro2010 Decadal Survey

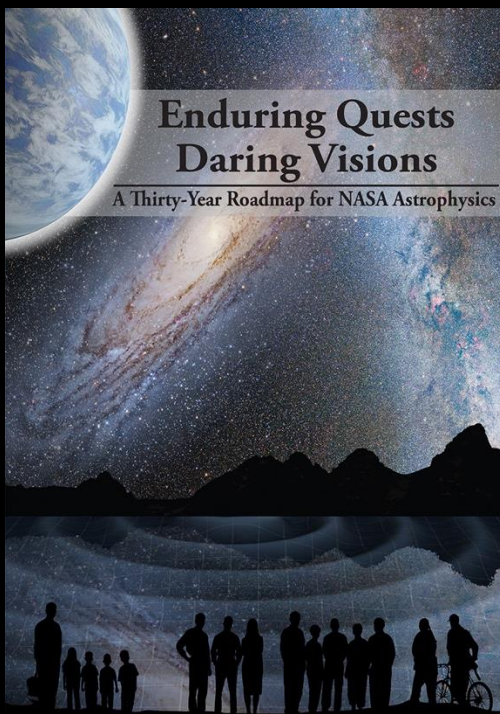
2010



National  
Academy of  
Sciences

## Astrophysics Roadmap

2013



NASA

## Consensus Study Report

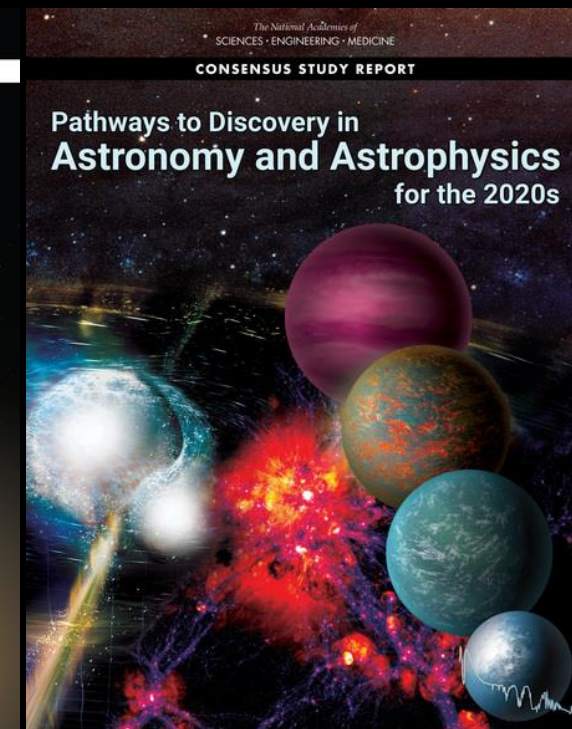
2018



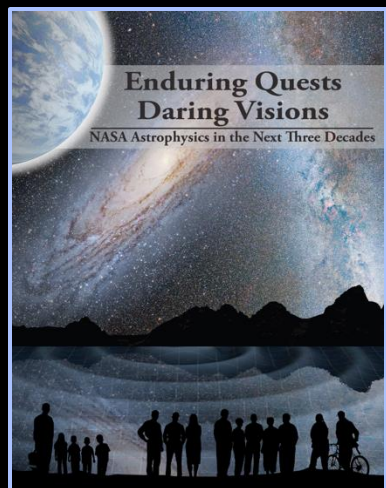
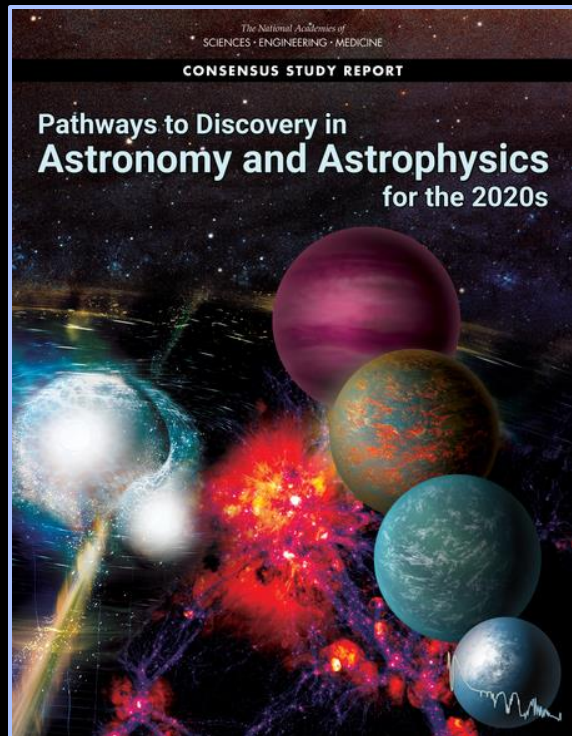
National  
Academy of  
Sciences

## Astro2020 Decadal Survey

2021



National  
Academy of  
Sciences



## Planning for the 2020 Decadal Survey An Astrophysics Division White Paper

POC: Paul Hertz, Astrophysics Division Director ([paul.hertz@nasa.gov](mailto:paul.hertz@nasa.gov))  
January 4, 2015

Overall Process: The process of developing the necessary science case and technical information for candidate large mission concepts may be described as a two-part process:

- Part A: Identification of a small set of candidate large missions, and
- Part B: Development of the science case and technical information for each member of the small set of candidate large missions.

Part A must include community discussion followed by a NASA decision on which candidate large mission concepts to study.

Part B must include designation of appropriate community-based science and technical teams, an iterative study process, and a cost and technology readiness assessment.

**The Future is Now!**





QUESTIONS?