



National Aeronautics and
Space Administration

NASA Town Hall

242nd AAS Meeting
New Orleans, LA

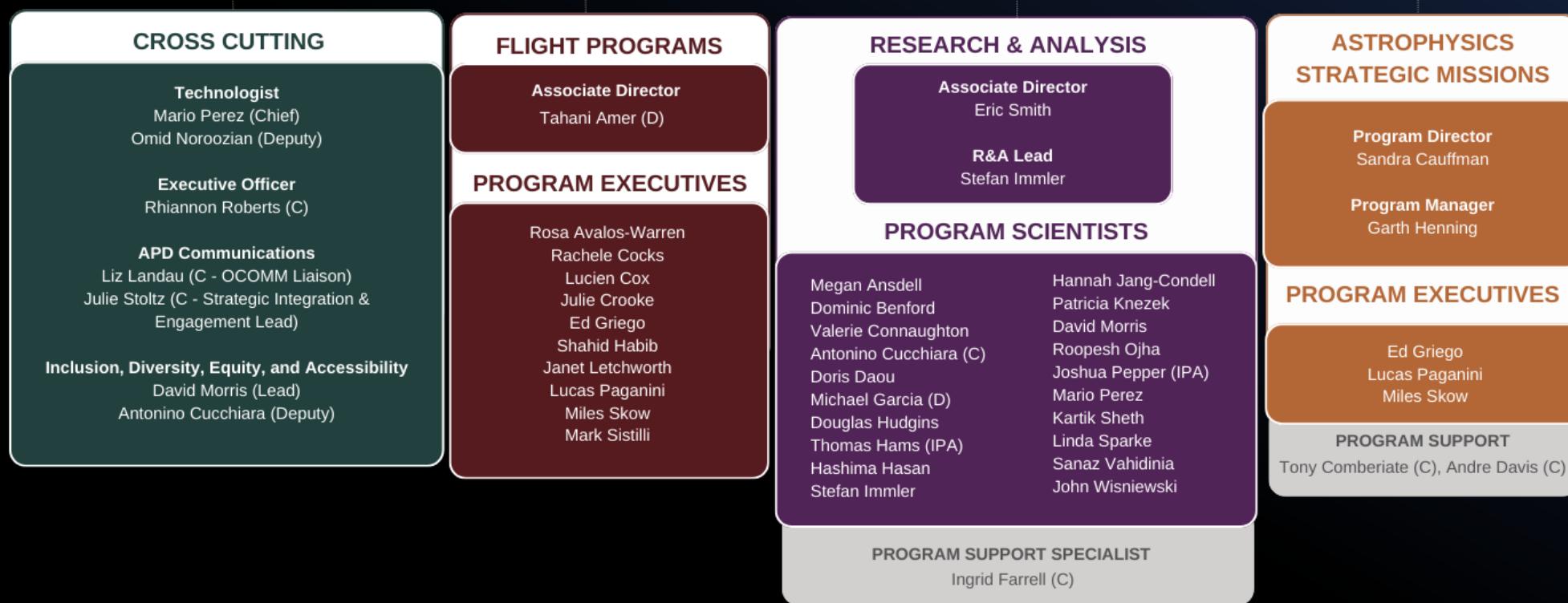
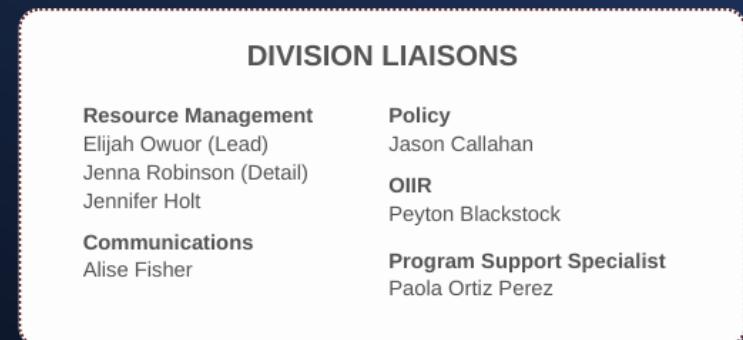
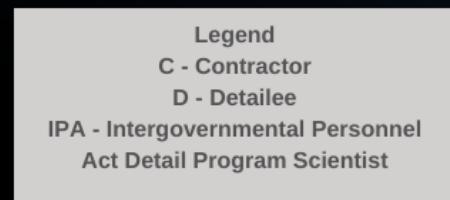
Dr. Mark Clampin
Director, Astrophysics Division
NASA Science Mission Directorate
January 7-11, 2024





Science Mission Directorate ASTROPHYSICS

Organizational Chart



APD Changes 2023 → 2024

APD →



Doug Hudgins
(PS)
→ DAR



Kartik Sheth
(PS)
→ OCS



**Sangeeta
Malhotra** (PS)
→ GSFC



Stefan Immler
(R&A lead)
→ OMB Detail



Bill Latter
(PS)
→ Retired



Manuel Bautista
(PS)
→ DOE



**Shawn Domagal-
Goldman** (PS)
→ GSFC

→ APD



David Morris
(PS)



Megan Ansdell
(PS)



John Wisniewski
(PS)



**Rosa Avalos-
Warren** (PE)



Rhiannon Roberts
(XO)



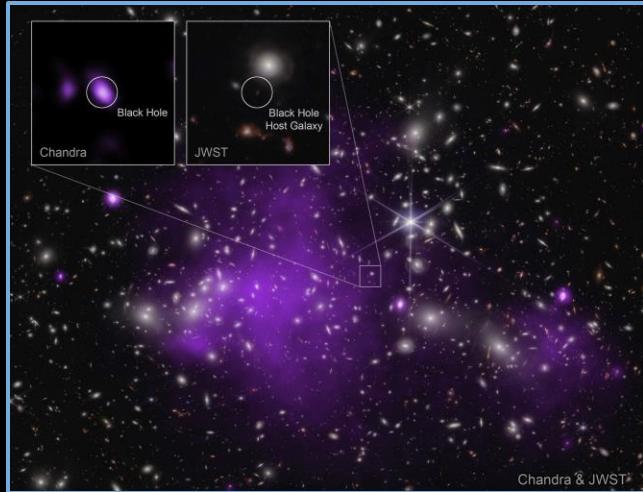
Julie Stoltz
(Engagement)



Tahani Amer
Associate Director
Flight Projects
(Acting)

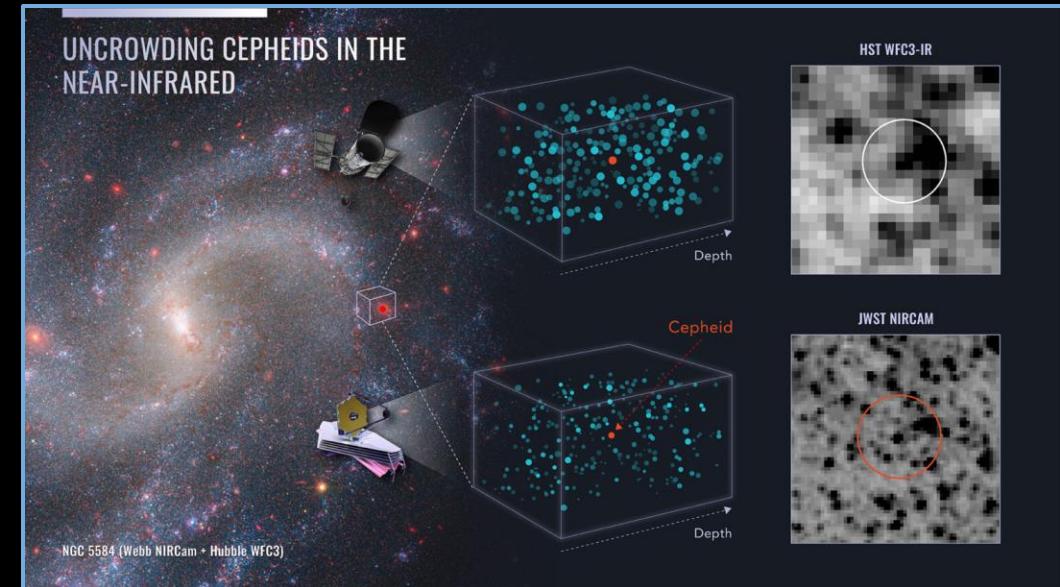
Science Highlights

James Webb Space Telescope

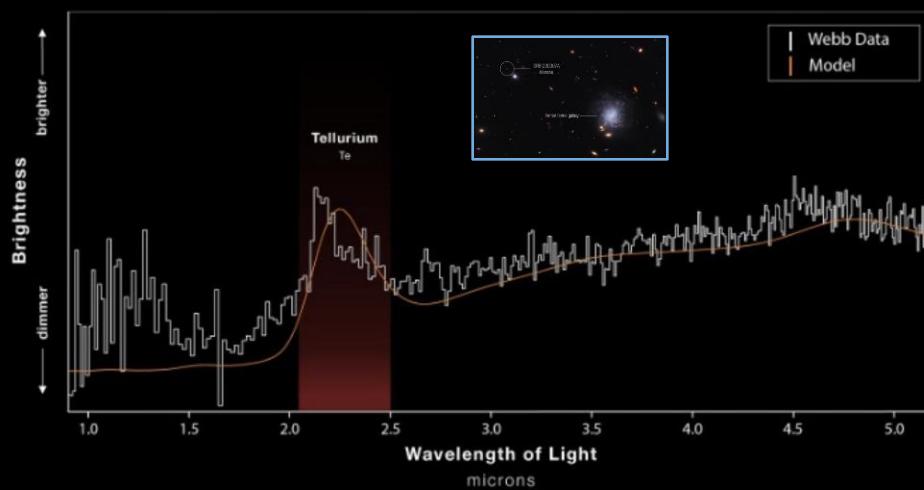


JWST & Chandra
Discover Most Distant
Black Hole

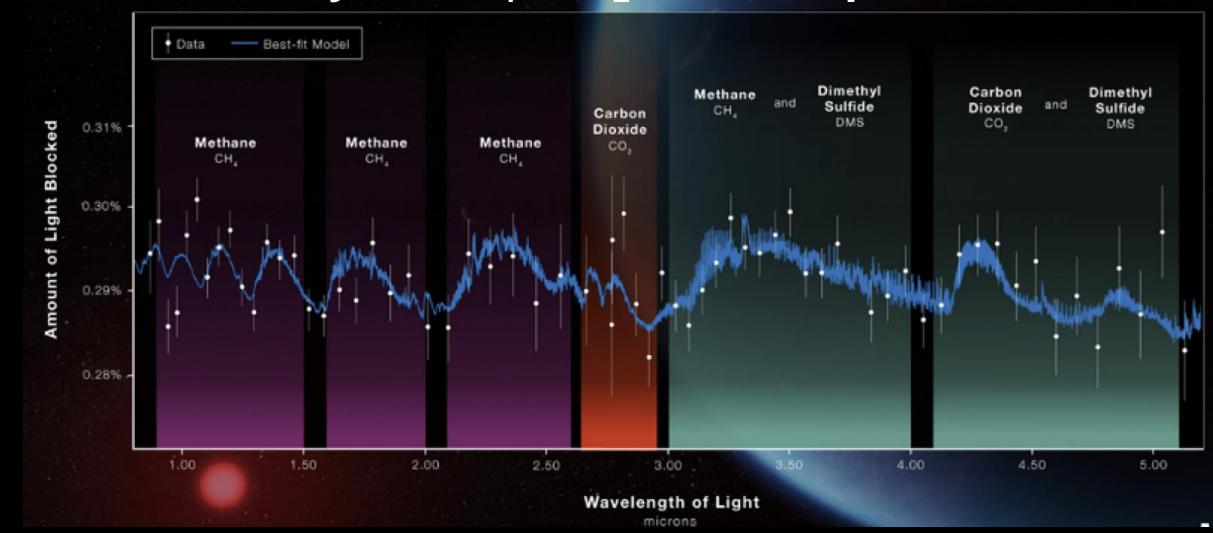
JWST confirms Hubble Tension



GRB 230307a Kilonova Explosion: Te detection



Discovery of CH₄, CO₂ in Atmosphere of K2-18 b

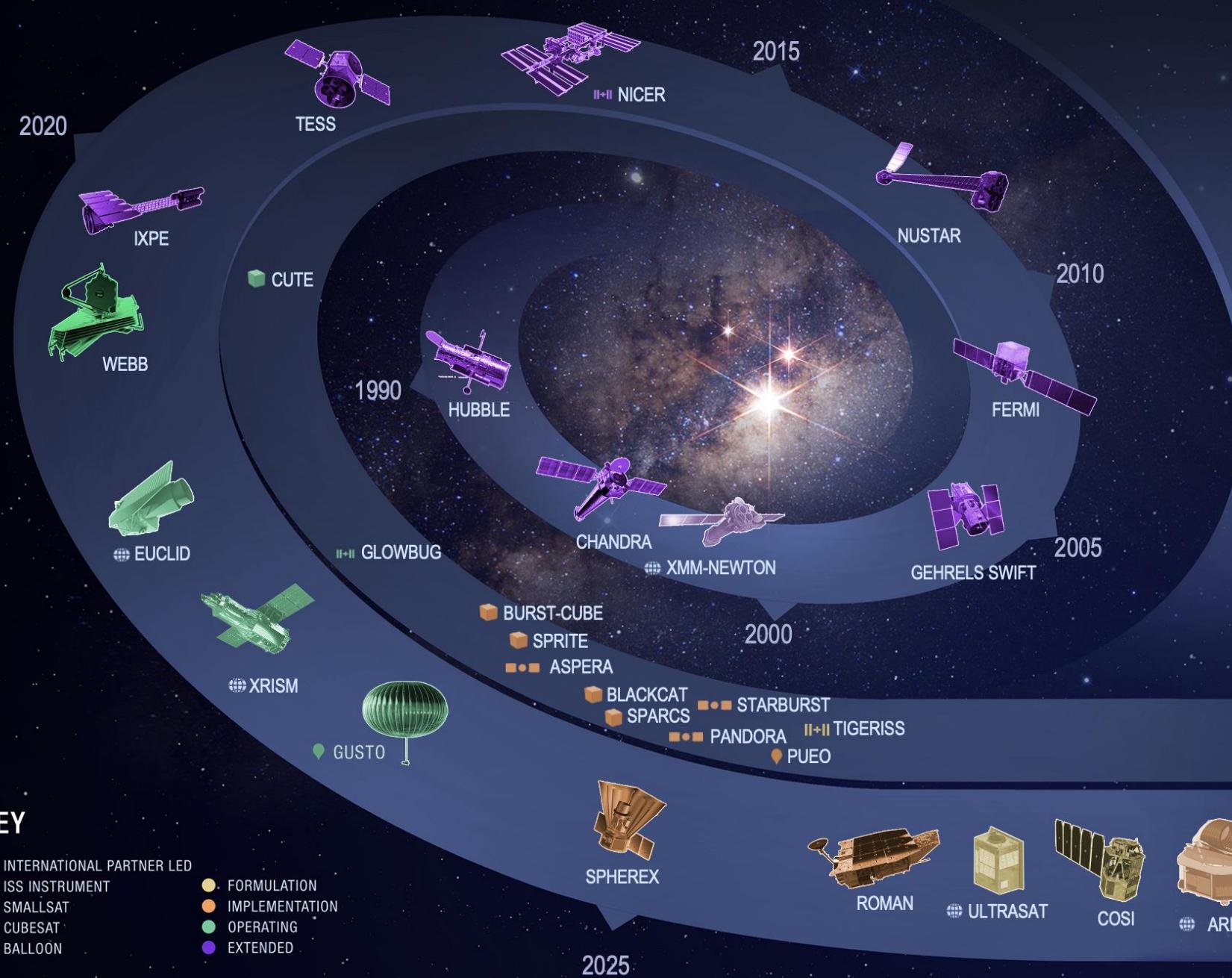


Budget

FY24 President's Budget

- **Bipartisan Budget Agreement (Signed by the President June 3)**
 - Expected to keep FY24 non-defense non-VA spending government-wide flat, at FY23 levels and increase FY25 non-defense non-VA spending government by 1%.
 - NASA's final FY24 appropriation could be significantly below the \$27.2 billion President's request, which represented a \$1.8 billion increase, or 7%, above FY23, to continue support for our priorities in Artemis, climate, science, and technology for future missions.
 - Both draft appropriations bills (House and Senate) are significantly below even the FY23 levels.
- **NASA is planning for an FY24 budget lower than FY24 Presidential Budget Request**
- **Currently operating on second Continuing Resolution (CR) of FY24, which ends Feb. 2nd**





National Aeronautics and
Space Administration



ASTROPHYSICS FLEET

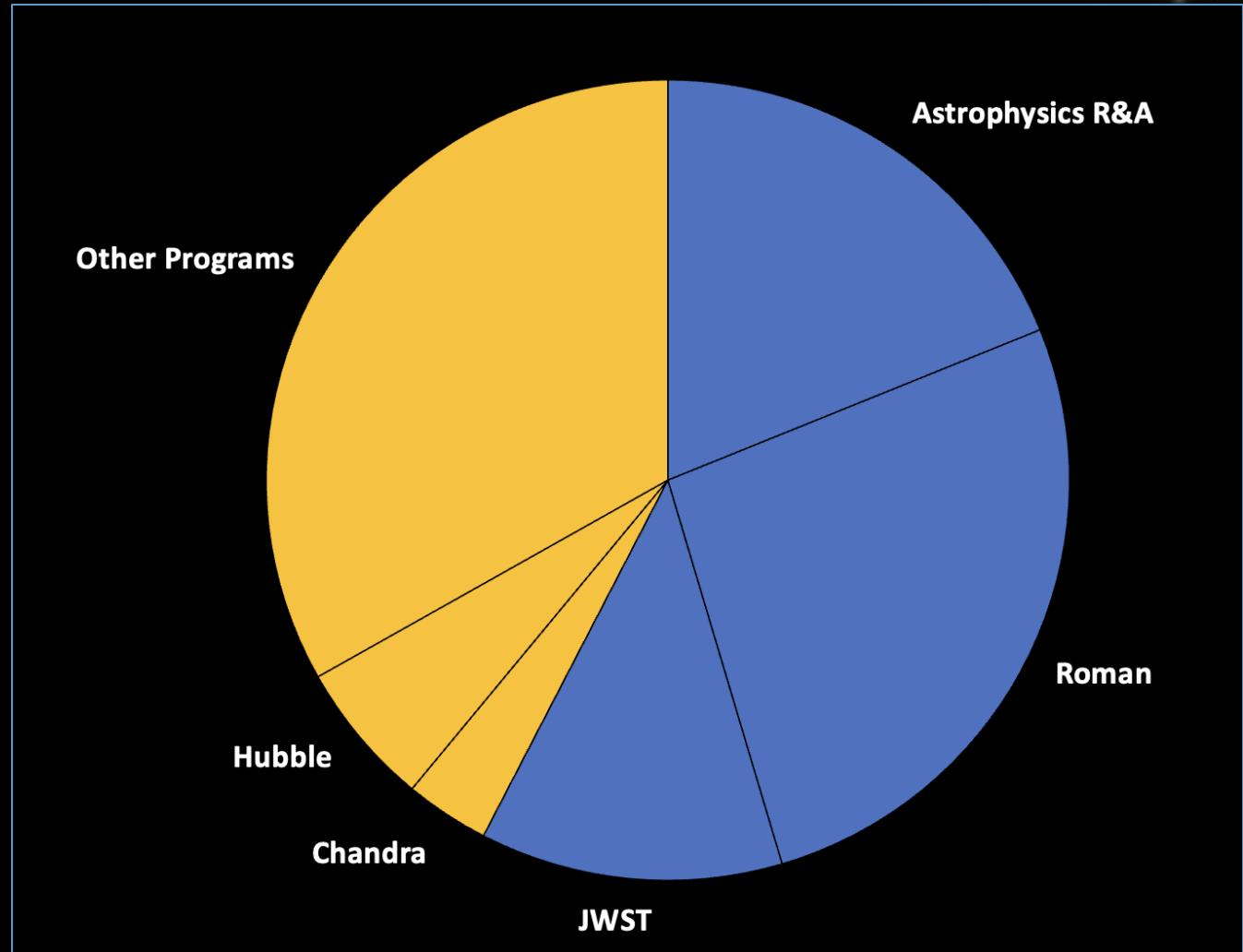
VERY SMALL MISSIONS

TRADITIONAL MISSIONS

Astrophysics's FY24 Budget

“Other Programs” Allocation includes:

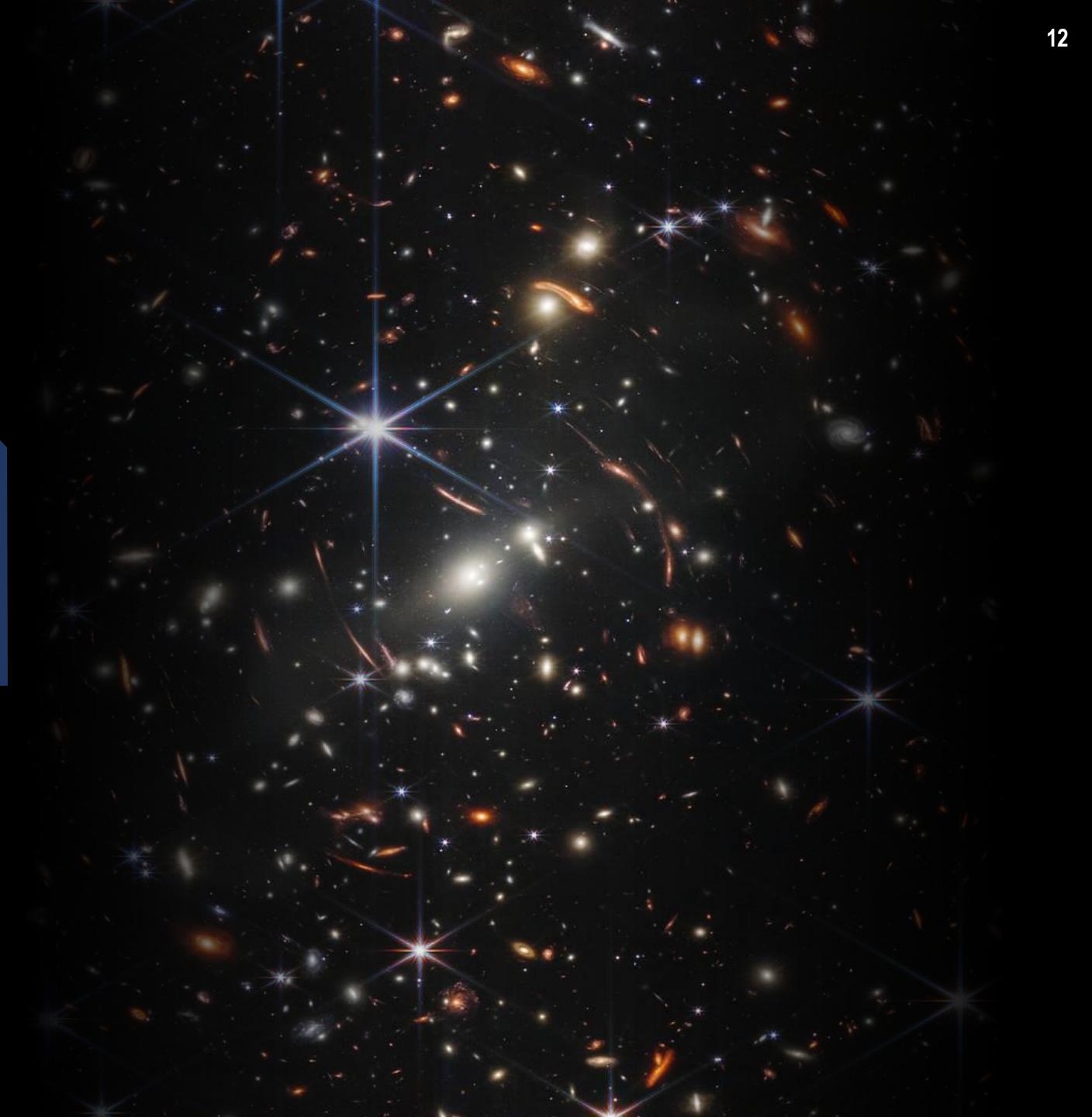
- **International Partnerships**
 - LISA
 - Athena
 - Ultrasat
- **Explorers**
 - SPHEREx
 - COSI
 - MIDEX 2021 AO
 - Operating Explorer Missions
- **SOFIA closeout**
- **Habitable Worlds Observatory**
- **Program Offices**



Astrophysics FY24 Budget Decisions

- **APD budget decisions focus on a balanced portfolio of missions and science**
 - Maintain Agency commitment to delivery of Roman
 - Maintain Explorer missions in development (SPHEREx and COSI)
 - Reviews underway for Probe Mission (AO FY23) and 2021 MIDEX/MO
 - International partnerships:
 - LISA transitions to management by Explorers office following ESA adoption (January 2024)
 - ATHENA investments are being restructured in response to ESA program reformulation
 - Technology investments for Habitable Worlds Observatory
 - Reductions to large, extended-operations missions
 - Chandra (25 years)
 - Hubble (34 years)
 - Mini-Senior Review (Spring 2024) planned to recommend path forward
- **Further reductions may be needed once budget landscape for FY2024 is clear**

Mission Updates



Nancy Grace Roman Telescope



Roman will unravel the secrets of dark energy and dark matter, study exoplanets, and explore topics in infrared astrophysics.

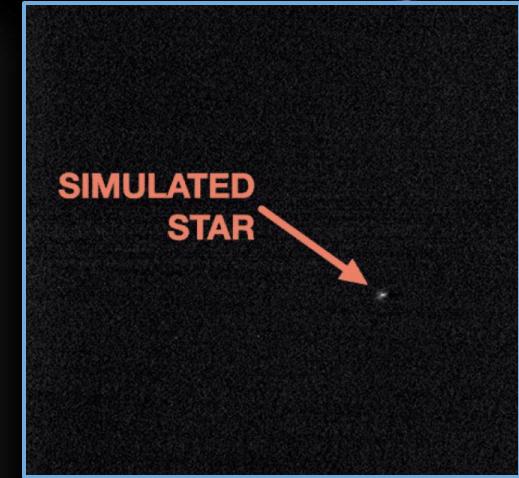
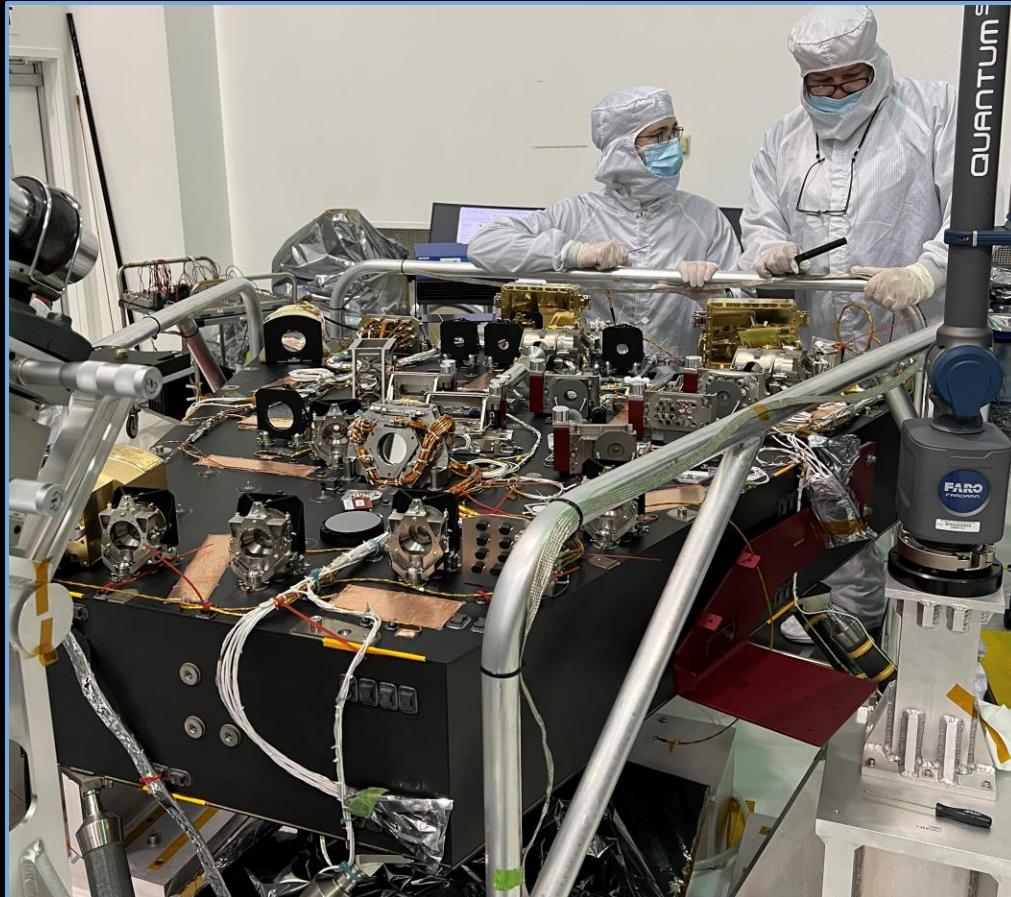
The Roman mission remains on plan for launch by May 2027, with telescope-level integration activities beginning in August 2024 as its hardware components arrive from partner institutions to NASA GSFC.

- [Telescope](#) integration continues at L3 Harris
 - Delivery to GSFC in August 2024.
- The [Instrument Carrier](#) structure completed fabrication at Northrop Grumman and was delivered to GSFC in Sep 2023.
- The [Wide Field Instrument \(WFI\)](#) completed instrument integration, at Ball Aerospace
 - Delivery to GSFC ~Aug 2024.



Nancy Grace Roman Telescope Coronagraph Instrument (CGI)

The Coronagraph Instrument (CGI) completed instrument integration. It continues environmental testing at JPL with estimated delivery to GSFC ~May 2024.



Post Full Functional Test lift onto shipping container which will be used to transport CGI to electromagnetic-testing facility

Roman Observing Program

- ***Core Community Surveys:*** Revolutionary surveys of unprecedented scale to address Astro2010 objectives
 - Three Large Surveys: Community owned and community defined
 - Survey definition committees formed to work with community to maximize overall science return
 - **High Latitude Wide Area Survey** (Chairs: Risa Weschler, Ryan Hickox)
 - **High Latitude Time Domain Survey** (Chairs: Masao Sako, Brad Cenko)
 - **Galactic Bulge Time Domain Survey** (Chairs: Jessie Christiansen, Dan Huber)
- ***General Astrophysics Surveys:*** Significant fraction of observing time set aside for other infrared surveys
 - Defined via competitive GI program and/or additional community processes
 - Completed community process to evaluate the science value of defining a GA Survey
- ***Coronagraph Instrument:*** 3 month observing allocation within the first 18 months of the mission
 - Top priority is to verify technical requirements (TTR5); expect to need 2-4 weeks (15-30% of allocation)
 - Remaining allocation available for expanded technology demonstration and scientific targets
 - CPP (Community Participation Program team) will facilitate community engagement

Roman Observing Program

- **Core Community Surveys:** Revolutionary surveys of unprecedented scale to address Astro2010 objectives
 - Three Large Surveys: Community owned and community defined

More information in:

Roman Core Community Survey Definition Splinter Meeting
Wednesday 9:00 – 11:30 AM

Roman Town Hall

Thursday 12:45 – 1:45 PM

- **Coronagraph Instrument:** 3 month observing allocation within the first 18 months of the mission
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Euclid

- ESA Euclid launch was successfully launched from Cape Canaveral by SpaceX on July 1, 2023
- Euclid has finished performance verification phase and has begun early science operation in December 2023
- First light Euclid images were released by the European Space Agency on November 7th 2023.



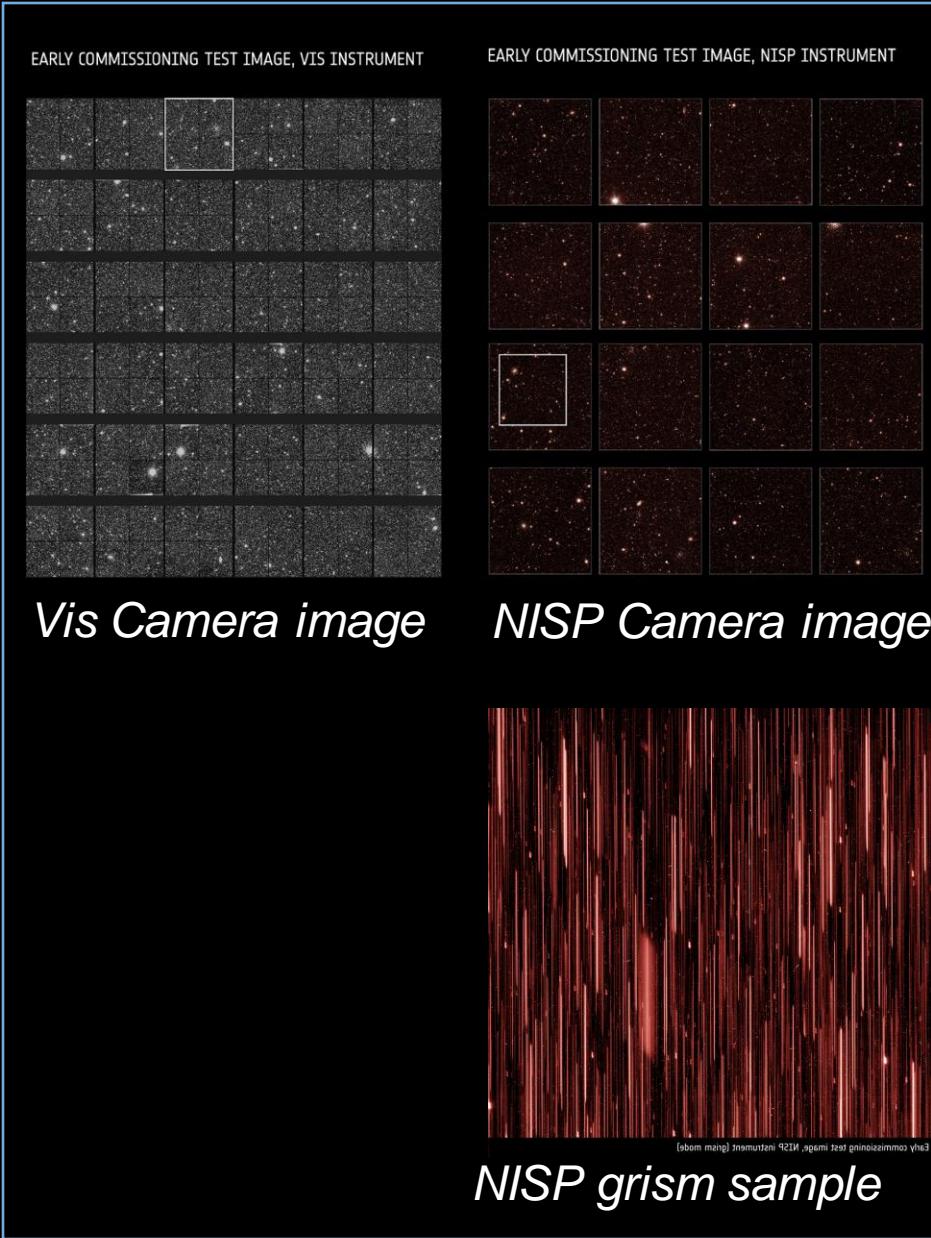
Horsehead Nebula



Perseus cluster



*Globular cluster
NGC6397*

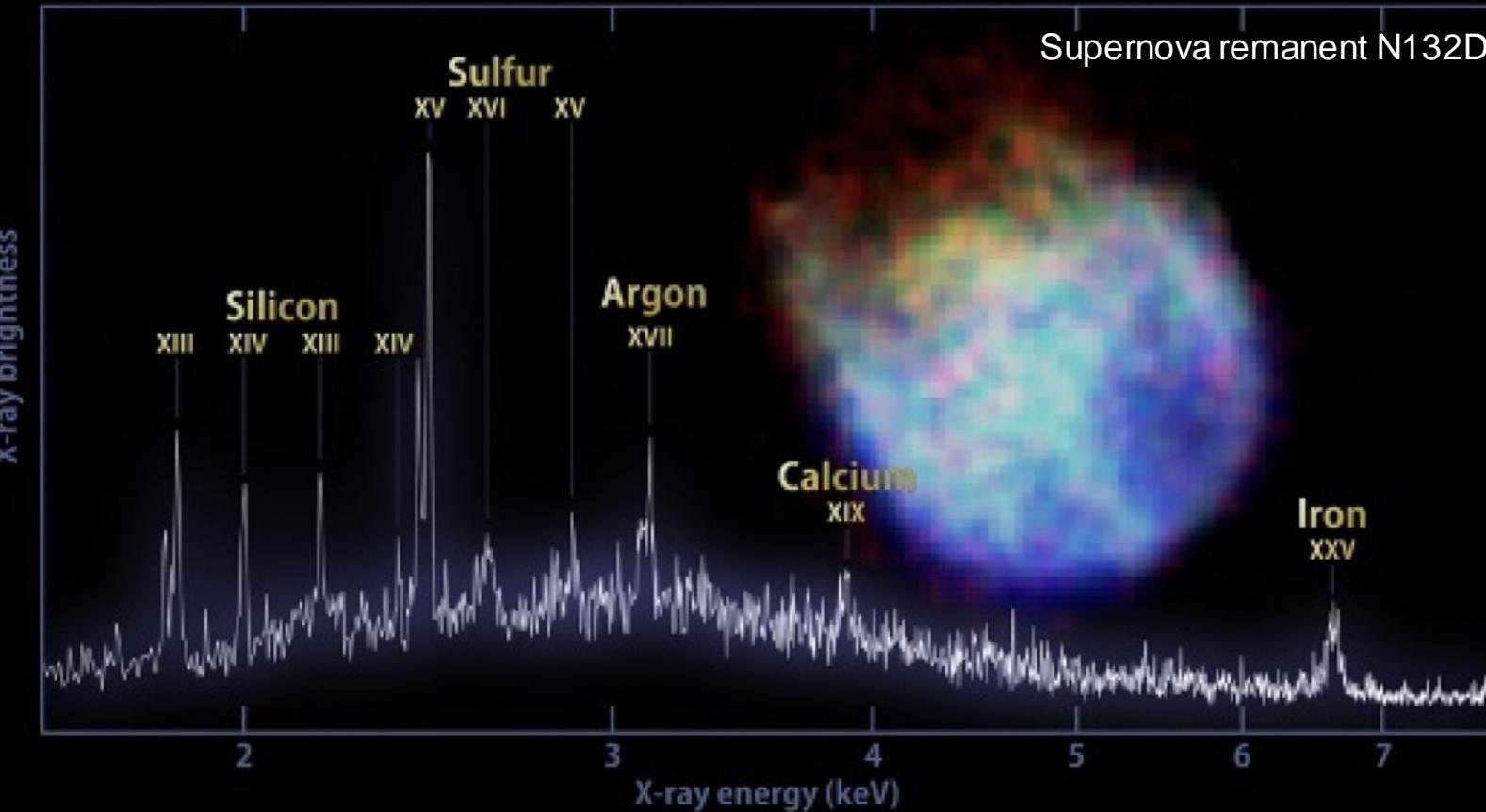


Credits: ESA/Euclid/Euclid Consortium/NASA

XRISM

X-ray Imaging and Spectroscopy Mission

- The XRISM spacecraft was launched 6th September 2023
 - XRISM's instruments are all working nominally
 - Excellent performance demonstrated by first light spectrum !



- Resolve's aperture door has not opened
 - Limits Resolve's energy range: 0.3 - 12 keV to **1.7 - 12 keV**.
 - Most Level-1 science requirements achievable with longer exposures
 - JAXA is assessing options
- The XRISM AO was released (Dec. 12)
 - AO deadline [April 4th](#)
 - Feb 1 start of science observations
 - Aug 1 cycle 1 observations

Balloon Program

Current Campaign: Antarctic Long Duration Balloon Campaign

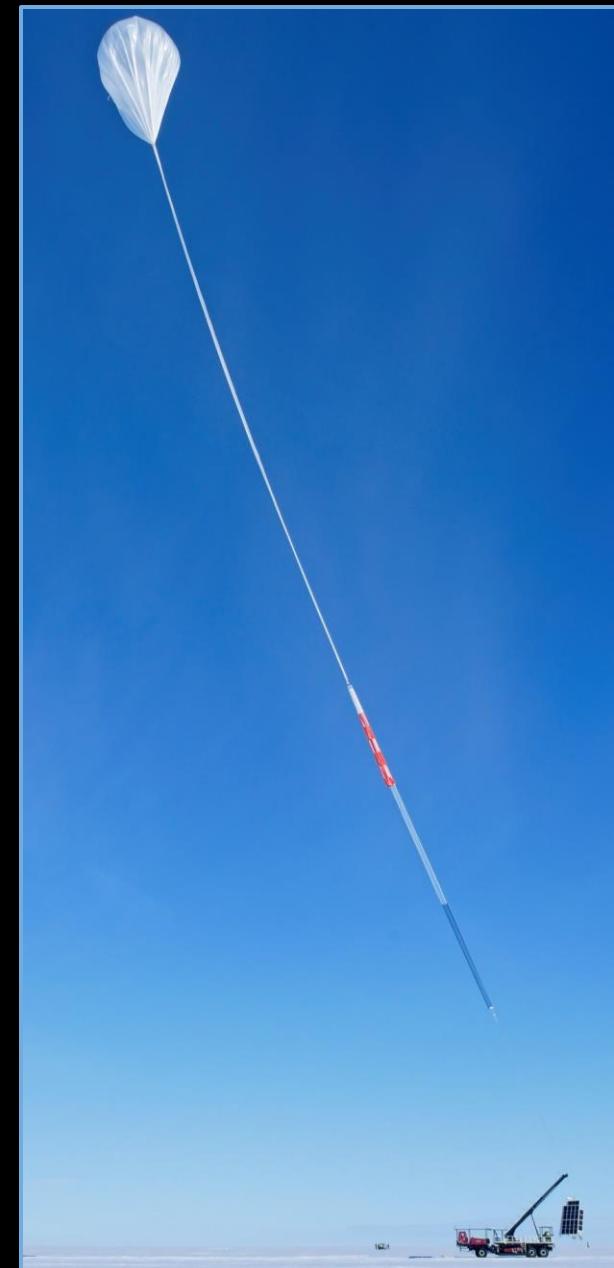
- Successfully flown a small balloon payload (LAURA, Dec. 10-26)
- GUSTO, the Astrophysics Explorer Mission launched on Dec. 31
- AESOP-LITE, a Heliophysics payload is awaiting launch opportunity

Recent Campaigns: Ft. Sumner Campaign

- Aug. 19 - Balloon engineering test flight
- Aug. 27 - GRAPE and ComPair balloon payload
- Sept. 7 - HASP balloon mission
- Sept. 25 - FIREBall-2 mission

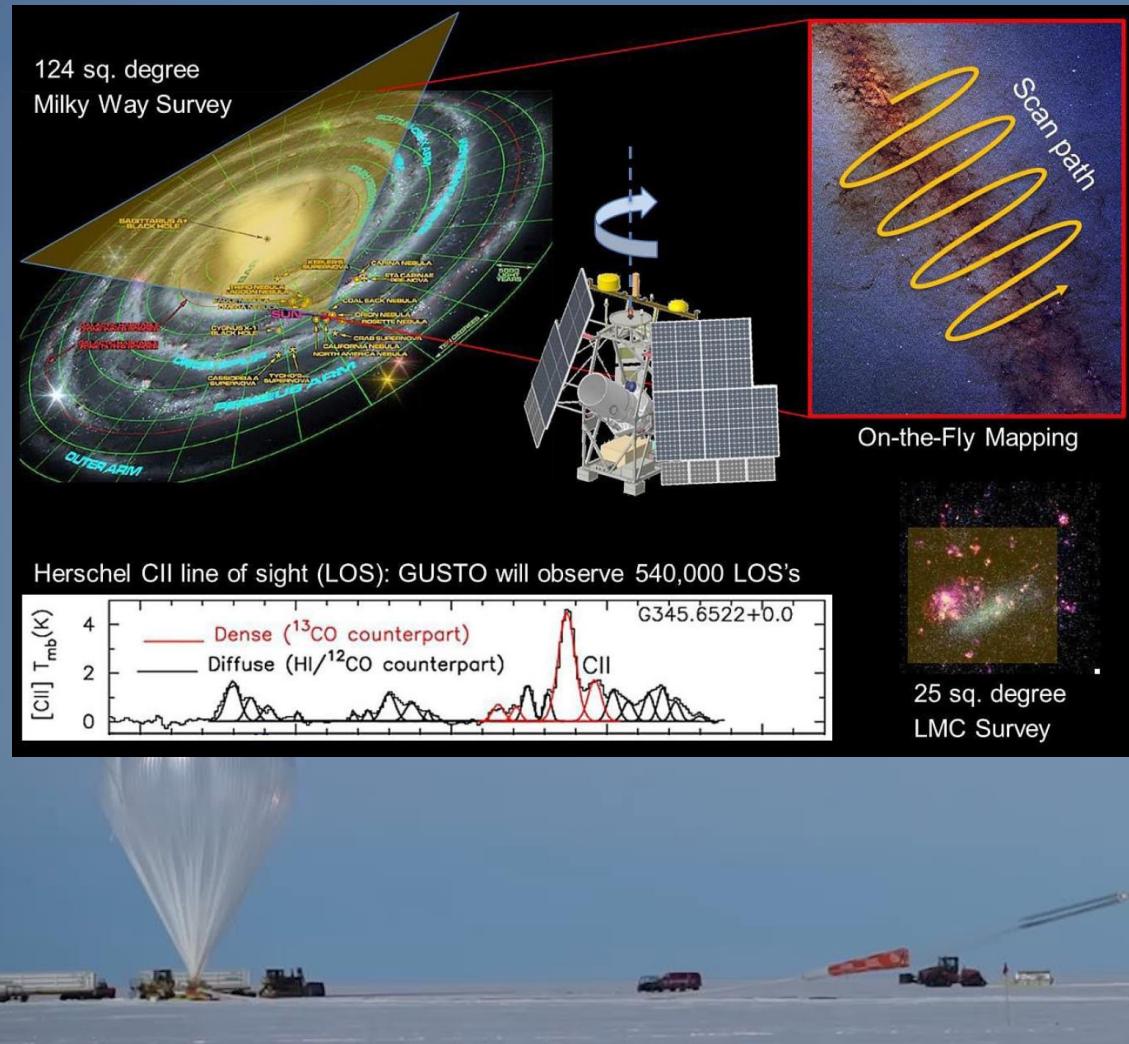
Future Campaign: Sweden Campaign – May-June 2024

- HELIX (APD), XL-CALIBUR (APD), BOOMS (HPD), & SUNRISE-3 (HPD)

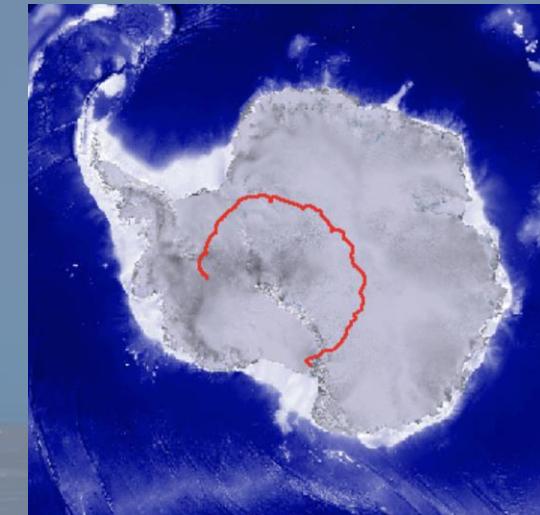


GUSTO

Galactic/Extragalactic ULDB Spectroscopic Terahertz Observatory



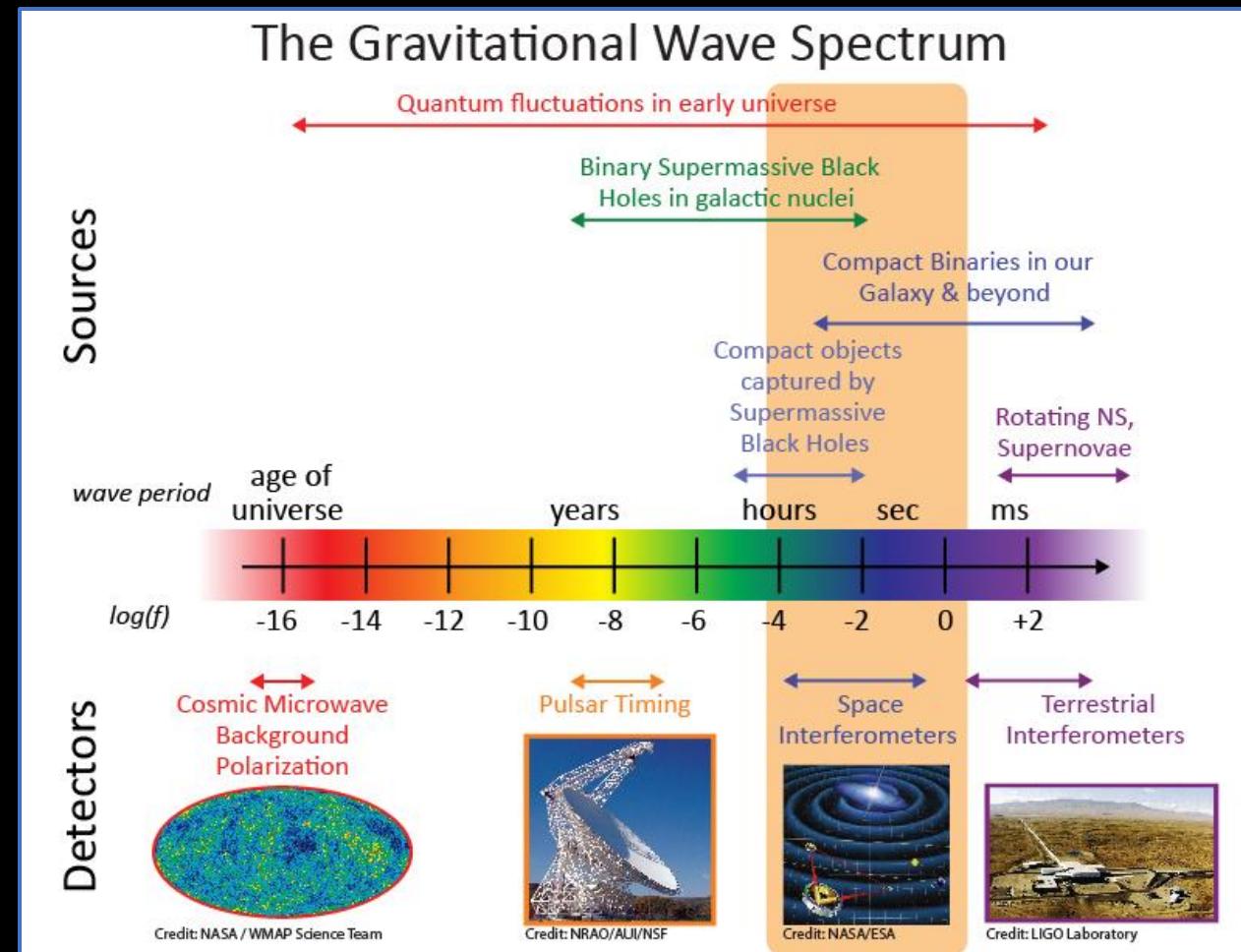
- **GUSTO explores the life cycle of interstellar matter from individual clouds to entire Galaxies, GUSTO directly addresses a central theme of the most recent decadal survey: Cosmic Ecosystems**
- **GUSTO will witness cloud formation and destruction, & directly measure the radiative and dynamic feedback that regulates the formation of stars and the evolution of galaxies through cosmic time.**
- **GUSTO launched**
 - 06:28 UTC Dec. 31, 2023
 - Altitude: 128,000 ft
 - Current location →



LISA

Laser Interferometer Space Antenna

- LISA will be the first space-based gravitational wave observatory
- NASA is partnering with ESA to provide key technologies and a science center for LISA
- NASA plans to formally establish LISA as a project in 2024
- Upcoming events
 - **Jan. 8:** LISA Mission Adoption Board Meeting
 - **Jan 25:** Science Program Committee meets to formally adopt the LISA mission



Sources in LISA's mHz band range from white dwarf binaries in our galaxy to merging massive black holes at extreme redshift

SPHEREx

Spectro-Photometer for the History of the Universe, Epoch of Reionization and Ices Explorer

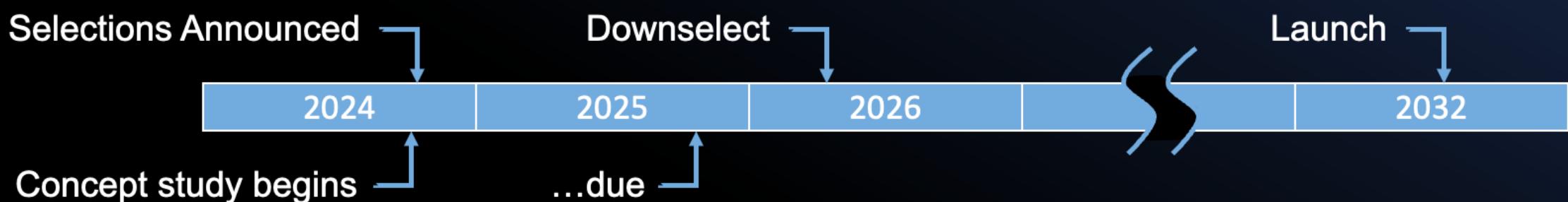
- **SPHEREx Science**
 - Over a 2-yr mission, SPHEREx will collect data on $\geq 3 \times 10^8$ galaxies, along with $\geq 10^8$ stars in the Milky Way to explore the origins of the universe.
- **Recent achievements**
 - SPHEREx Photon Shields completed vibration testing
 - Fourth and last payload thermal vacuum test is ongoing
 - System Integration Review (SIR) was successfully completed November 16, 2023
- **Upcoming**
 - **Jan. 30:** Key Decision Point-D
 - **Launch:** 2025



Credit: Ball Aerospace

Explorers Schedule of Announcement for Selections

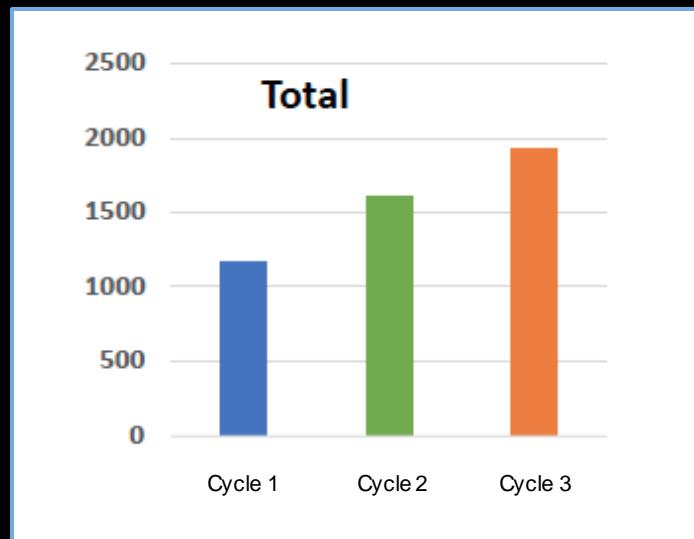
- **MIDEX 2021 AO:** selections will be announced in Q1 of 2024
- **Astrophysics probe:** PI cost capped (\$1Bn) mission
 - In response to the Astro2020, the scope of Probe proposals addresses:
 - A far-Infrared or X-ray probe
 - Probe proposals were due November 16th 2023



- **Pioneers**
 - Selection of proposals deferred pending clarification of FY24 Budget
 - Program is not cancelled

James Webb Space Telescope

- James Webb Space Telescope continues to operate at full science capability
 - 18 months into its 5-year prime mission.
- Cycle 1 and Cycle 2 observations are well underway
 - 1,931 Cycle 3 proposal total, with final selection being notified on February 28
 - Cycle 3 observations begin July 1, 2024.



- As of December 2023, over 450 articles have been published in peer-reviewed journals with “JWST” in the title or abstract.



Dr. Jane Rigby
Senior JWST Project Scientist



Dr. Jennifer Lotz
Director,
Space Telescope Science Institute
Starting: February 12, 2024

Technology Development and Maturation

From Innovation to Infusion



Active Maturation Programs:
COR 17, ExEP 21, PhysCOS 20

Technology Management:
Tech gap prioritization in 2024

Infusions: Over 140
and counting...

Workforce: Three new Roman
Technology Fellows in 2023

Upcoming
Deadlines

D.3 - APRA and D.7 - SAT - Proposals due: January 31, 2024
D.19 - Critical Technologies for Large Telescopes (Industry) - Proposals due: April 3, 2024

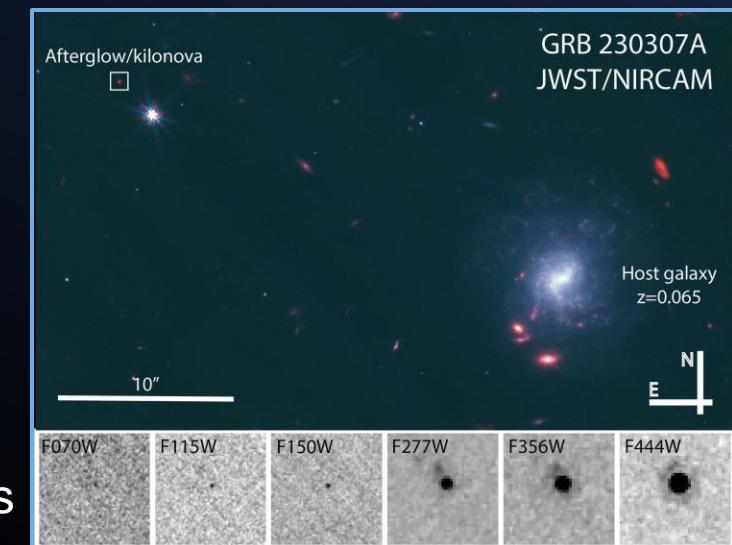
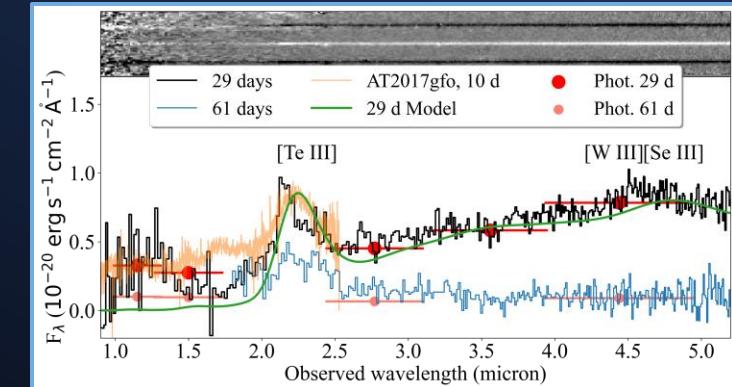
Time Domain and Multimessenger Astronomy

- **TDAMM Science Interest Group:** newly formed community-led effort focused on making the best use of NASA assets for TDAMM activities (PhysPAG, COR, & ExEP)
- **Science Analysis Groups**
 - *Gamma-ray Transient Network:* report received summer 2023
 - *TDAMM Space Communications:* working on requirements for ground-to-space and space-to-ground communications in post-TDRS, commercial era
 - *Future Innovations in Gamma Rays:* kickoff in GR SIG splinter (Tuesday, Jan 9th 10:00-11:30am, Rm 219)
- **ACROSS pilot initiative** focused on situational awareness, observational awareness, and cross-mission follow-up decision support tools + development of TDAMM-focused AO for tools and science
 - Phase II of TDAMM study focusing on understanding how to coordinate information sharing, tool development, and coordination with ground-based community
- **NSF NOIRLab workshop** *Windows on the Universe* focused on infrastructure and ground-space coordination; 2nd white paper released December 2023
- **General Coordinates Network** investment in infrastructure upgrade to modern, open-source, reliable, and secure alert distribution technologies, and deployed in the cloud

Mission Highlights & Status

JWST observations of GRB 230307A reveal a kilonova associated with a long GRB and significant r-process nucleosynthesis

- **New missions and missions in development:**
 - **Glowbug:** operating on ISS since April 2023; reported detections of four gamma-ray bursts via the GCN
 - **BurstCube:** flew to Houston for final vibe testing, integration and storage for launch and deployment next spring
 - **Roman:** community survey to get inputs/definition on surveys, including TDAMM aspect
 - **ULTRASAT:** U.S. participating scientists selected
 - **StarBurst:** launch in 2025 to study neutron star mergers
 - **COSI:** launch in 2027 - Data challenge released
 - **NEO Surveyor:** Planetary defense, NIR mission launch in 2028 to identify near-Earth moving objects – astrophysics survey / transient capabilities
- **LVK O4 Run :** Began May 2023; *Swift* “zero latency ToO” follow-up capability tested, for use with early-warning GW candidate alerts



Importance of Inclusion, Diversity, Equity, Accessibility (IDEA)

“The panel [on the State of the Profession and Societal Impacts] asserts that fundamentally, the pursuit of science, and scientific excellence, is inseparable from the humans who animate it.”

- Astrophysics has pioneered and piloted IDEA activities that are now adopted across SMD:
 - 1. Inclusion Plans adopted in various ROSES elements across all SMD divisions *
 - 2. Code of Conduct now adopted for panel reviews across all SMD divisions
 - 3. Statement of Principles adopted for NASA Astrophysics
 - 4. Dual Anonymous Peer Reviews adopted across all SMD divisions
 - 5. Inclusion Criteria in Senior Reviews of Missions adopted across all SMD divisions *
 - 6. Increasing diversity of reviewers for all panels expected across all SMD divisions
 - 7. Collection, evaluation, and publication of demographics (ROSES) *
 - 8. Regularly report data on proposal submissions and success rates *
 - 9. SMD Bridge Program funded for better engagement with Under-resourced institutions/MSIs *
- <https://science.nasa.gov/smd-bridge-program>
- In ROSES24, the ADAP solicitation will not require proposers to prepare a full budget (but a budget category)
 - Pilot the addition of the Inclusion Plan as evaluation requirement for the Probe selection
 - Have begun Community Engagement with virtual visit to Puerto Rico; future engagement with this and other communities planned this year
 - Email pamela.j.king-williams@nasa.gov if you are interested in hosting a virtual visit; contact david.c.morris@nasa.gov or antonino.cucciara@nasa.gov for further information

* Responsive to an Astro2020 Decadal Survey recommendation

Statement of Principles



SMD Bridge Program



NASA SMD BRIDGE PROGRAM:

An Opportunity for Faculty at non-R1 and MSIs to Partner with NASA

Purpose: Faculty PI and NASA Co-I Build and strengthen partnerships between NASA's Science Mission Directorate (SMD) and emerging research institutions, in any science, engineering, and/or technology area relevant to NASA SMD objectives, by focusing on paid student research experiences and faculty development.

Eligibility: Non-R1 faculty and NASA CS or contractor Faculty at emerging research institutions include non-research intensive institutions (i.e., non-R1), and many MSIs, HBCUs, TCUs, PUIs, PBIs, HSIs and/or community colleges. Faculty fund their students as well. Proposals must have a NASA Co-I.

Current Status:

Accepting proposals to ROSES23 F.23 Seed Funding
Planning for ROSES24 F.18 Full Program and F.20 Seed Funding

Full Program

ROSES24 F.18

Call opening Fall 2024

Up to \$500k/yr. for 3-5 yr.

Seed Funding

ROSES23 F.23 and ROSES24 F.20

Apply Now!!!

Up to \$150k/yr. for 1-2 yr.

Community Engagement

Symposia, Webinars, Office Hours,

Mentor Training

Simplified Proposals, Reimagined

Review Process

NASA Participants and

Center/Division POCs Needed

GOMAP/Habitable Worlds Observatory



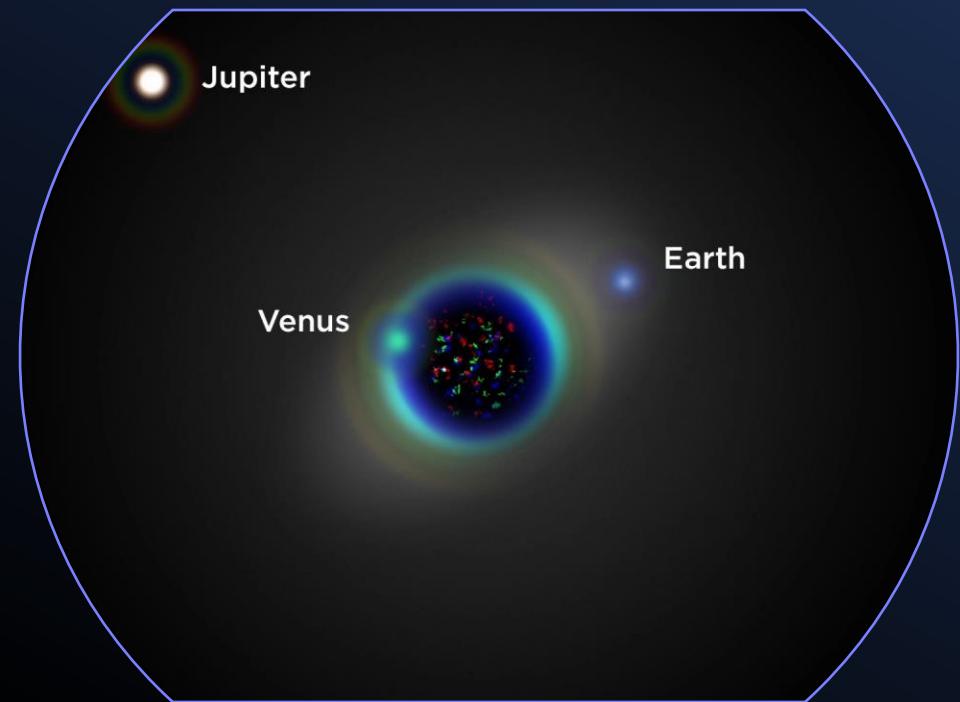
Visit the new HWO site!



The Habitable Worlds Observatory

- Decadal Survey (ASTRO2020) priority science area
 - Are there habitable planets harboring life elsewhere in the universe?
 - Conduct a program of transformational astrophysics
- Announced Habitable Worlds Observatory one year ago!
- Big Picture Strategy
 - *Build to schedule: Mission Level 1 Requirement*
 - *Evolve technology: Build upon current NASA investments*
 - *Employ Next Generation Rockets*
 - *Robotic servicing at L2*
 - *Mature technologies first: Reduce risk by fully maturing the technologies prior to development phase.*

More info in HWO Splinter Meeting
Wednesday 12:45 – 3:30 PM in R08 / R09



HWO - Transformational Astrophysics



Mapping the Baryon
cycle in emission and absorption



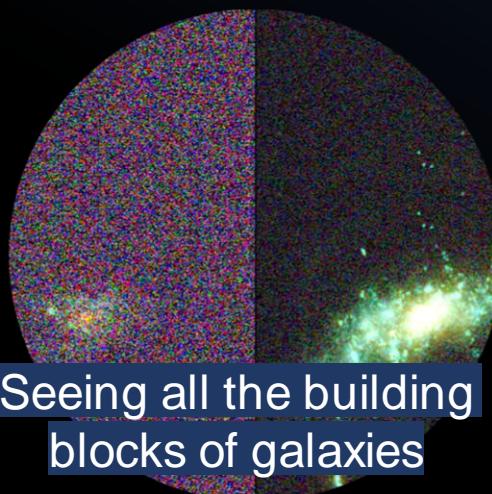
Deep Fields 8x faster
than HST and 4x JWST



UV spectroscopy of
millions of sources



Viewing the Solar System in
HD at high cadence



Seeing all the building
blocks of galaxies



Resolved stellar populations
beyond the Milky Way

Habitable Worlds Observatory/GOMAP Teams

APD - HQ



Megan Ansdell (PS)



Julie Crooke (PE)



Joshua Pepper (Dep. PS)

**Science, Technology, Architecture
Review Team (START)**



Courtney Dressing
UC Berkeley
Co-Chair



John O'Meara
W. M. Keck Observatory
Co-Chair

**Technical Assessment
Group (TAG)**



Lee Feinberg
Engineer Co-Chair



Aki Roberge
Scientist Co-Chair



Bertrand Mennesson
Scientist Co-Chair



John Ziemer
Engineer Co-Chair

NASA Astrobiology



David Grinspoon

Senior Scientist for
Astrobiology Strategy
'Up & out'



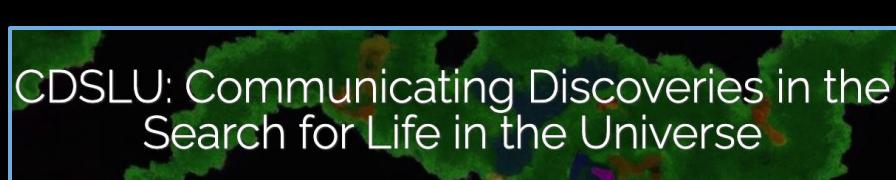
Lindsay Hays

Program Scientist for
Astrobiology
'Down & in'



Becky McCauley Rench

Deputy Program Scientist for
Astrobiology



- Kickoff webinar: Feb 23, 11am to 12 pm EST
- Day 1: Mar 1, 11 am to 1 pm EST
- Day 2: Mar 4, 11 am to 2 pm EST
- Day 3: Mar 6, 11 am to 3 pm EST



Explore novel biosignatures
and pioneer new research
directions in astrobiology



Astrobiology
Strategy 2025

Review of NASA's Postdoctoral Program

- After >50 years, NASA is conducting the first ever review of the NASA Postdoctoral Program (NPP)
 - NPP offers unique research opportunities to highly-talented U.S. and non-U.S. scientists to engage in ongoing NASA research projects at a NASA Center, NASA Headquarters, or at a NASA-affiliated research institute (<https://npp.orau.org>)
- The purpose of the NPP review is to identify ways the NPP may be enhanced in its effectiveness and to reflect on the merit of its current objectives
- The review team is seeking comments on the NPP from anyone
- To provide input, please contact any of the following or follow the QR code
 - Steven Cummer (Duke U), Study co-chair cummer@duke.edu
 - Stefanie Milam (NASA GSFC), Study co-chair stefanie.n.milam@nasa.gov
 - Paul Hertz (NASA HQ), Study director paul.hertz@nasa.gov



Astrophysics Division NEEDS YOU!

- NASA seeks one or more Ph.D.-level scientists to serve as visiting Program Scientists through the Intergovernmental Personnel Act (IPA) in the Astrophysics Division at NASA Headquarters in Washington, DC.
- Deadlines:
 - **Application Deadline:** Friday, February 9, 2024
 - **Selection Goal:** ~April 2024



Please reach out to Program Scientists at this meeting to find out more about what Program Scientists do at NASA HQ!



2024

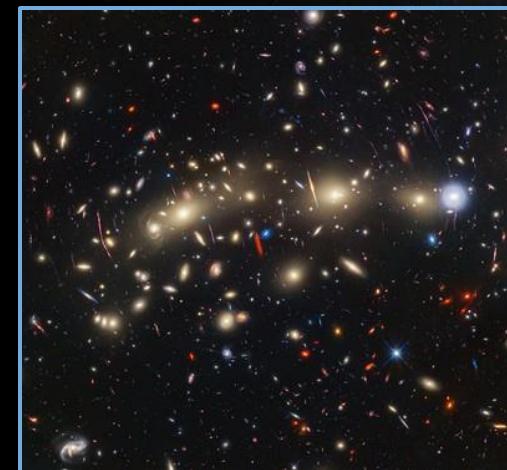
- 2024 is a big year for major deliveries of Roman hardware and instruments, and science planning
- Webb will start Cycle 3 observations.
- SPHEREx integration and test in preparation for a 2025 launch
- Habitable Worlds Observatory START/TAG teams will move forward on science trades and technology investments begin
- APD's R&A program continues with a range of technology development, astrophysics research, and GO/GI programs



CGI open table



Wide Field Imager at BATC





QUESTIONS?

Stay Connected with the Astrophysics Division

- NSPIRES mailing list – information about NASA solicitations
 - <https://nspires.nasaprs.com/>



- Cosmic Origins, Exoplanet Exploration, Physics of the Cosmos mailing lists.
 - Information about NASA missions and science
 - <https://cor.gsfc.nasa.gov/cornews-mailing-list.php>
 - <https://exoplanets.nasa.gov/exep/exopag/announcementList/>
 - <https://pcos.gsfc.nasa.gov/pcosnews-mailing-list.php>



Cosmic Origins

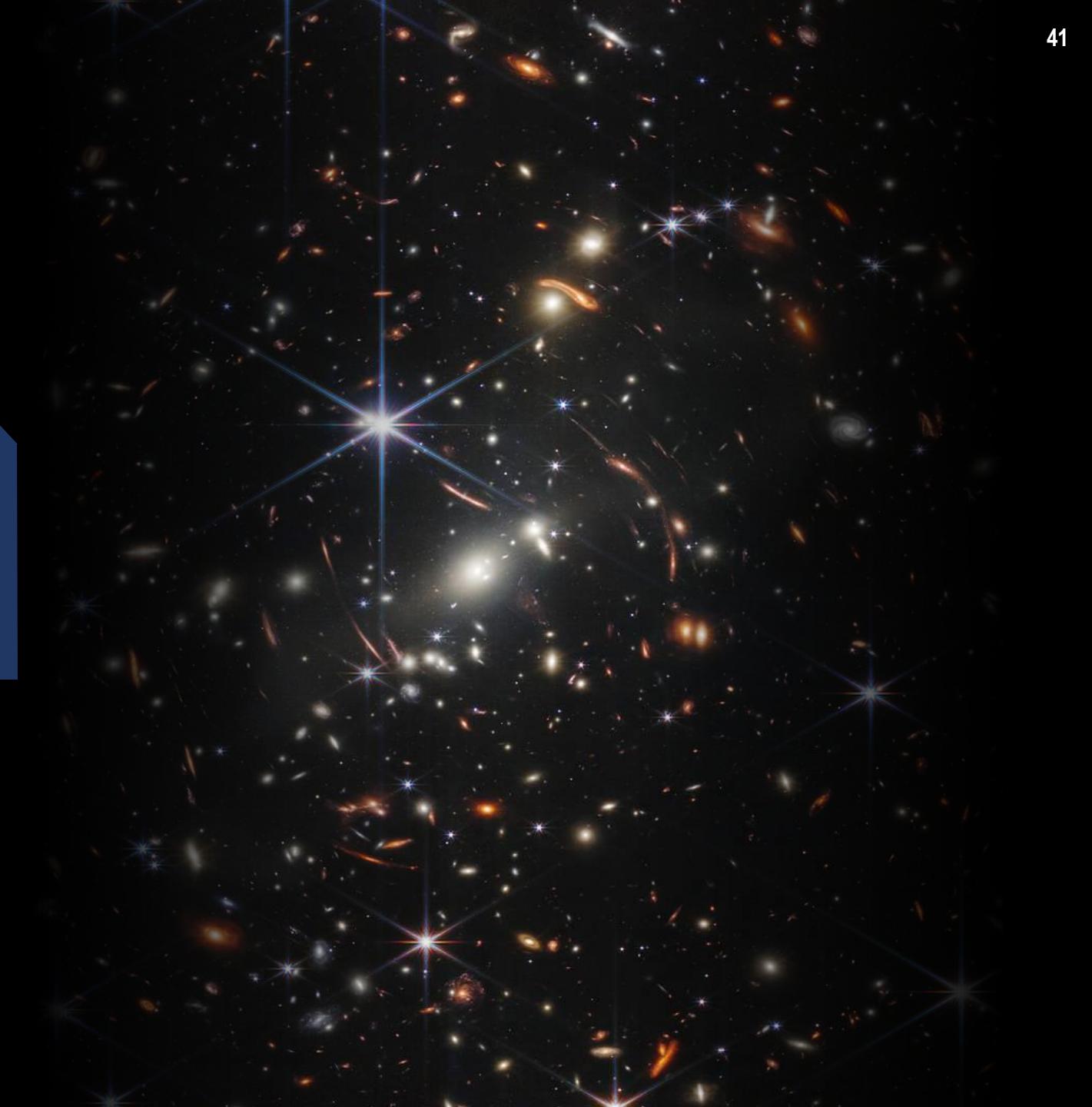


Exoplanet Exploration



Physics of the Cosmos

Backup



NASA Transform to Open Science (TOPS)

Complete NASA's open science curriculum!

Open Science 101:

A community-developed introduction to **core open science skills**

- Know how to write a NASA open science and data management plan
- Learn about tools and best practices
- Increase the impact & visibility of your science
- Earn your digital NASA open science badge

All 5 modules now available through a self-paced online course and through in-person and virtual instructor-led workshops.

Take OS101!



<https://go.nasa.gov/40pPQMx>

Opportunities with HWO/GOMAP

- **HWO Working Groups**
 - The START and TAG have established an initial set of Working Groups (WGs) to explore the HWO mission concept, including general astrophysics science goals, as recommended by Astro2020.
 - Community members are invited to participate in the WGs; more information will be provided at the AAS HWO Splinter Session* and on the GOMAP/HWO website.
 - WGs will conduct work over at least the next year; WG topics and membership will evolve, as needed.
- **Mentoring:** GOMAP leadership with the START & TAG are exploring different pilot models:
 - Leveraging the **SMD Bridge Program** to engage Under-Resourced Institutions (URIs)
 - Established a DEIA and Mentorship Working Group
- **Competed ROSES programs:** ADS-PS, SAT/APRA, HWO Systems Tech, EPRV

***HWO Splinter Session – Wed, Jan 10: 12:45 – 3:30pm in R08 / R09**