



STScI | SPACE TELESCOPE
SCIENCE INSTITUTE

EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

STScI Town Hall

Nancy Levenson, Frank Summers, Karoline Gilbert, Erik Tollerud

AAS January 2024



Overview

Agenda:

- General STScI updates including JWST and HST (Nancy Levenson)
- Reaching the Public and Science Visualization (Frank Summers)
- Roman Core Community Surveys (Karoline Gilbert)
- Notebooks for science (Erik Tollerud)
- Q&A

Reminder: Slack channel #235-stsci-town-hall for questions

Visit the STScI booth throughout for details about all these topics, work with your data, find job opportunities, and more!

We're hiring!

STScI supports these missions, delivering data through MAST



STScI | SPACE TELESCOPE
SCIENCE INSTITUTE

SCIENCE.TECHNOLOGY.OUTREACH.CAREERS

YOUR PARTNER IN OPTIMIZING THE SCIENCE
FROM SPACE ASTRONOMY MISSIONS

MAST

MIKULSKI ARCHIVE FOR SPACE TELESCOPES

HUBBLE

HUBBLE SPACE TELESCOPE



KEPLER

KEPLER MISSION



WEBB

JAMES WEBB SPACE TELESCOPE



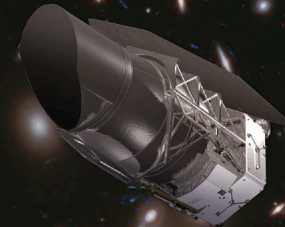
TESS

TRANSITING EXOPLANET
SURVEY SATELLITE



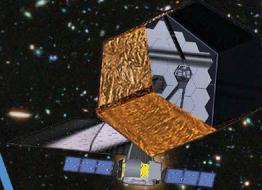
ROMAN

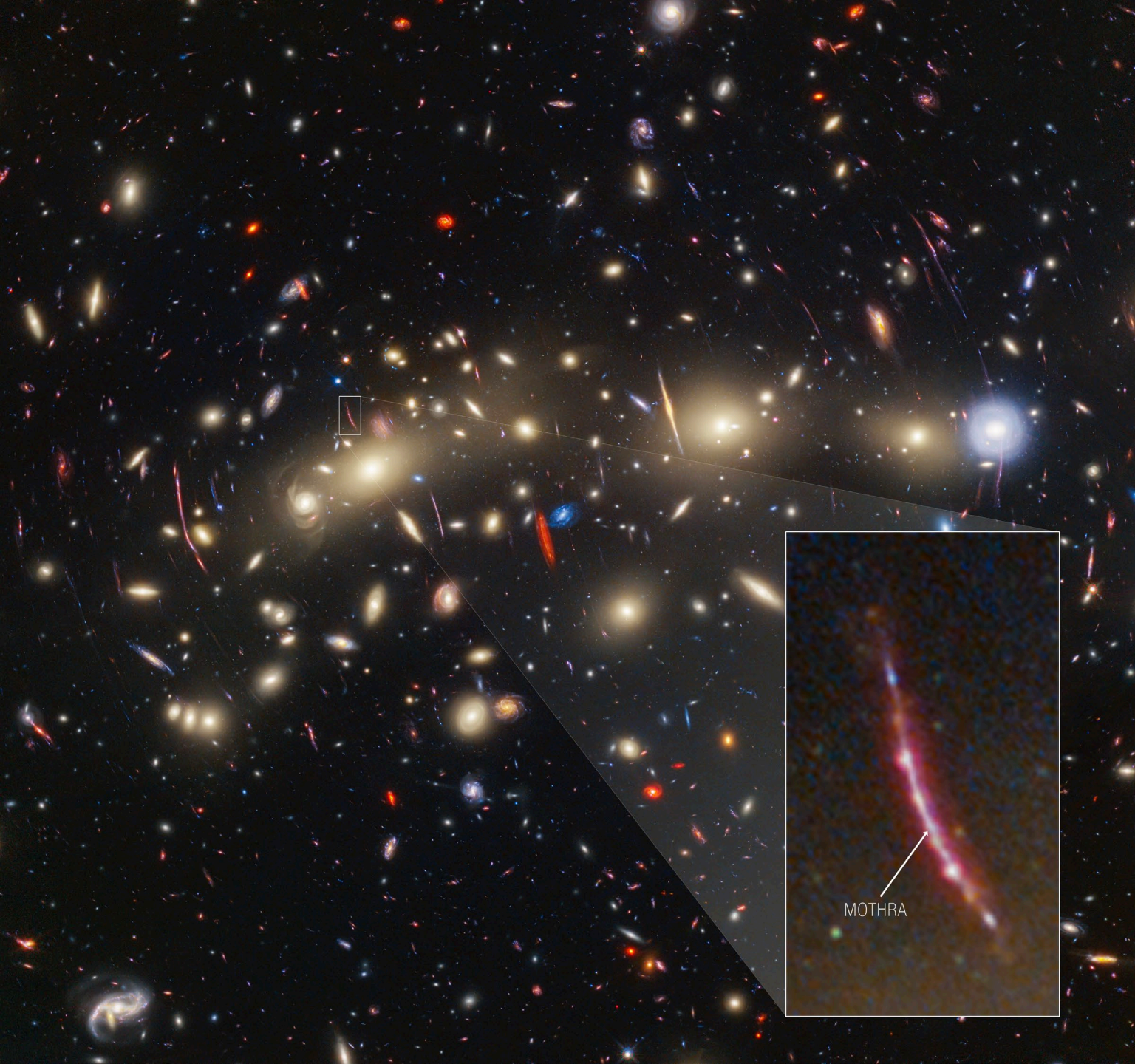
NANCY GRACE ROMAN SPACE TELESCOPE



THE FUTURE

HABITABLE WORLDS OBSERVATORY





Hubble + JWST

MACS0416

$z=0.544$ cluster

lensed individual star(s)

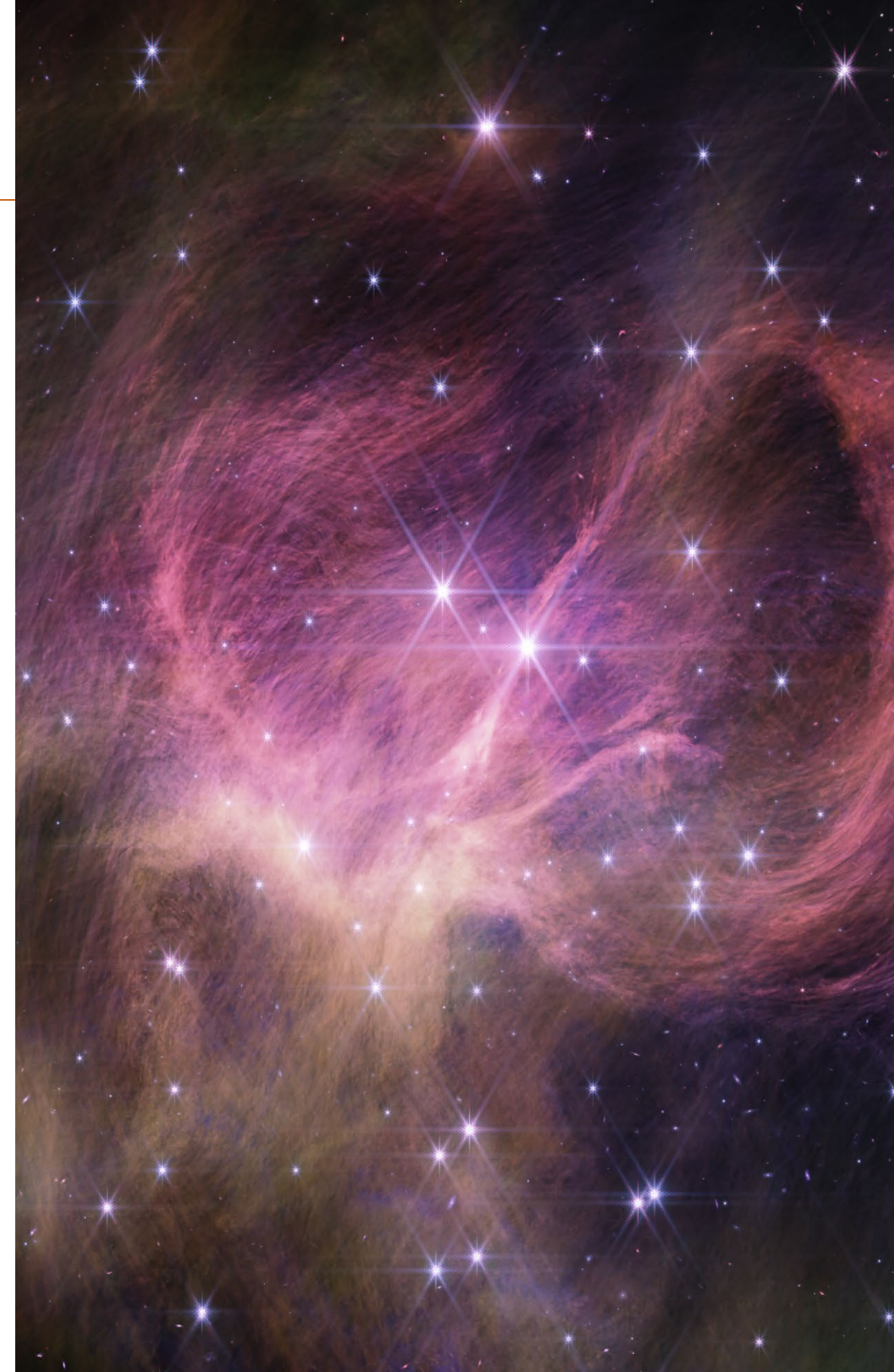
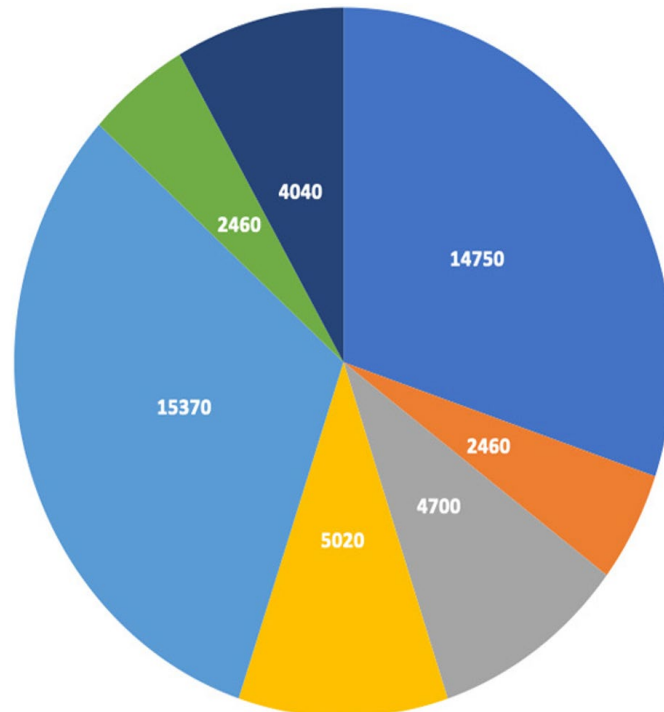


JWST Updates

- Amazing science! More than 700 research papers
- Cycle 3: 1,931 proposals submitted (world record!)
 - 9:1 oversubscription
 - results late February/early March
- JWST Observer News and Newsletter
<https://www.stsci.edu/jwst/news-events/news>

Cycle 3 Requested Hours

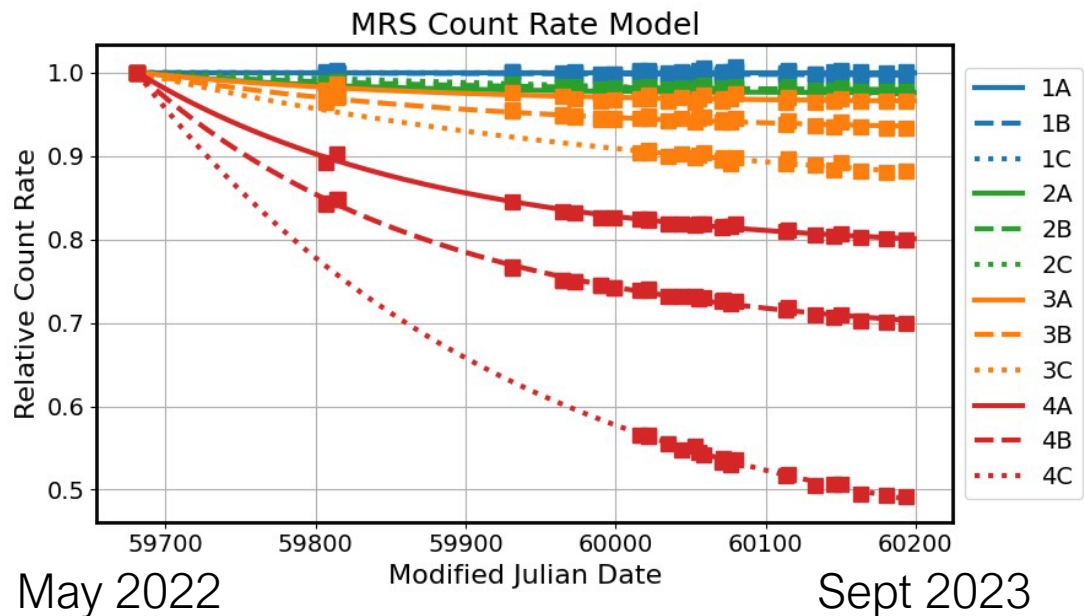
- Exoplanets
- Solar System
- Stellar Physics and Stellar Types
- Stellar Populations and the ISM
- Galaxies and IGM
- Large Scale Structure
- SMBH and AGN





JWST Updates

- Successful operations:
 - Cycle 2: >90% time for science and calibration
~60% of this collecting photons
 - Exquisite and stable optical quality
- MIRI loss of throughput at long wavelengths
 - up to ~50% MRS; 20% imager
 - now stabilizing
- Other instruments nominal





JWST Data Products and Communication Initiatives

- We acknowledge community challenges with data products, related to pipeline, calibrations, and documentation
- Key resources:
 - Jdox page of [Known Issues with JWST Data Products](#)
pipeline caveats, issues, workarounds including notebooks, schedule of pipeline updates
 - Jdox page on [Calibration Uncertainties for all instruments/modes](#)
 - [Improving JWST Data Products Workshop](#) for user input and solutions
 - [materials and discussions](#) available; will inform improvements
- Additional communications
 - [JWebbinars](#) on pipeline processing
 - JWST Office Hours starting February: bi-weekly personal interaction with JWST experts
 - Keep using the Help Desk, including suggestions for improvements
 - Community survey completed; now analyzing results
 - Ask-the experts at STScI booth
 - JWST Town Hall Wednesday, 6:00PM, Room 215

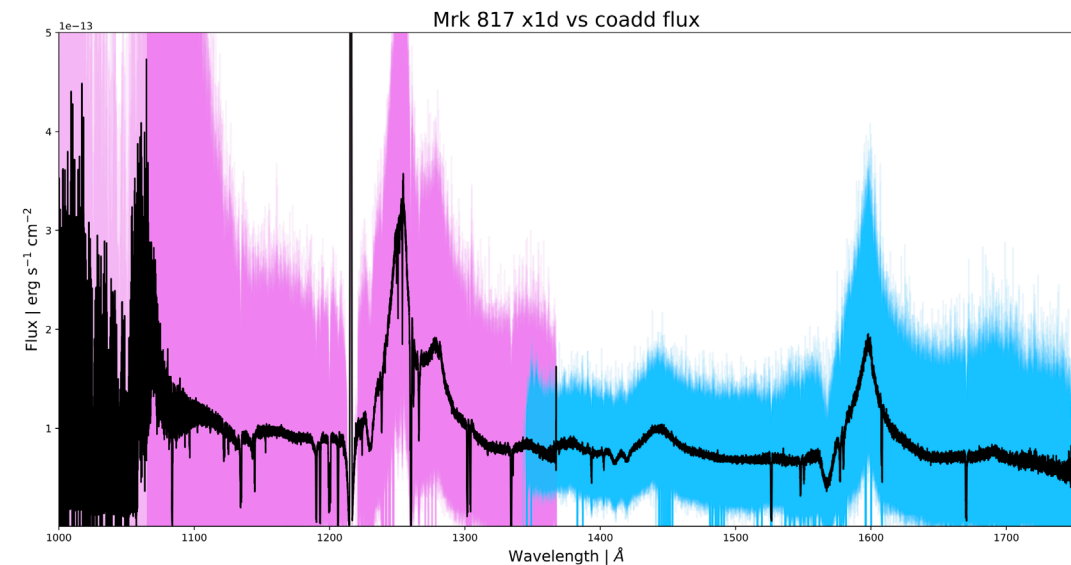
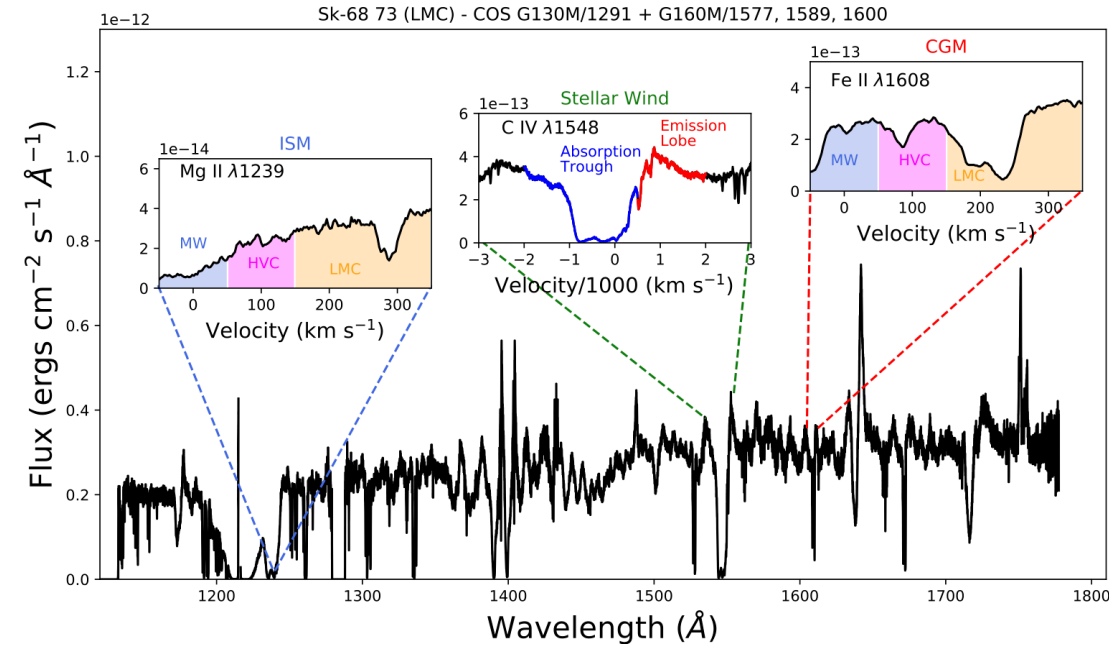
JWebbinar





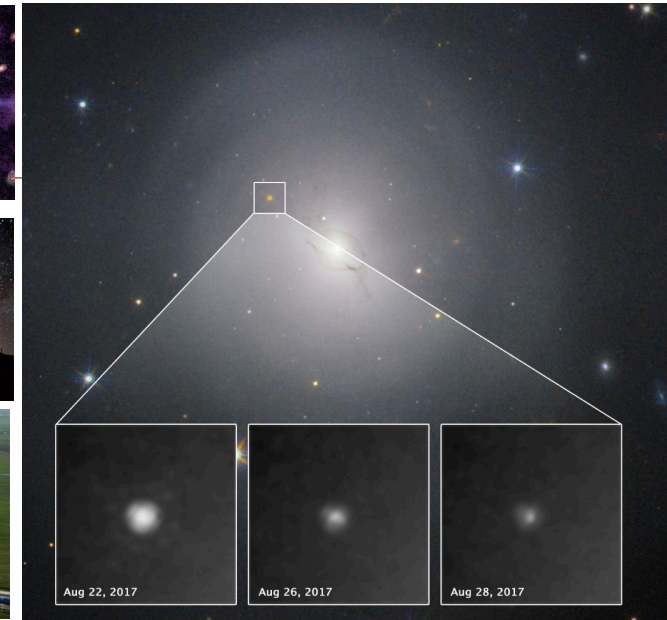
Hubble Updates

- High scientific productivity and demand
 - Peer-reviewed papers & oversubscription near all-time highs
 - Cycle 32 deadline is March 26, includes Multi-Cycle Treasury programs
- UV Legacy Library of Young Stars as Essential Standards (ULLYSES)
 - Observations complete
 - Final Data Release (DR7) on Dec 15, 2023
- New Hubble Advanced Spectroscopic Products (HASP) for COS & STIS coming in early 2024

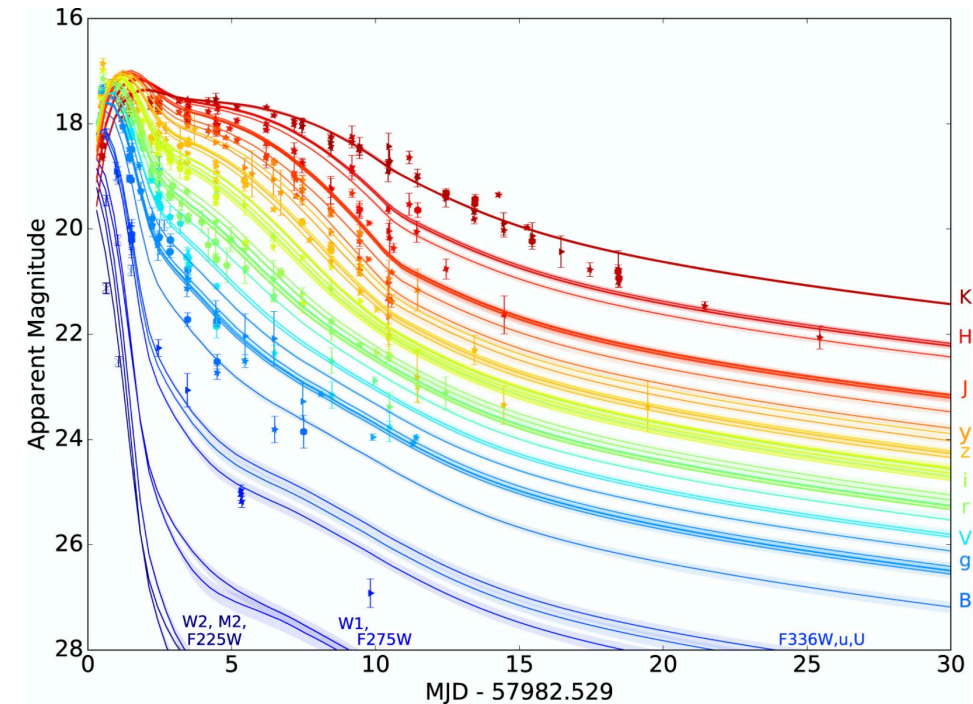




Hubble Updates



- Periods of observation failures due to an erratic gyroscope
 - Pursuing operational mitigations to maintain all-sky UV/optical coverage
 - Can transition to reduced gyro mode when necessary
 - Preserves Hubble science operations for the 2020s
 - Scientific performance will be essentially unchanged
 - Instantaneous sky coverage will be reduced by half
 - Reduced observing efficiency
- Hubble science evolves with the field & other facilities
 - Time Domain & Multi-Messenger (TDAMM) increasingly important
 - Hubble's sky coverage & UV/optical capabilities critical to TDAMM
 - We are exploring new ways to enable TDAMM science (e.g., Flexible Thursday Targets of Opportunity, TDAMM panel for Time Allocation Committee)
 - We want your ideas! How can Hubble enable TDAMM science?





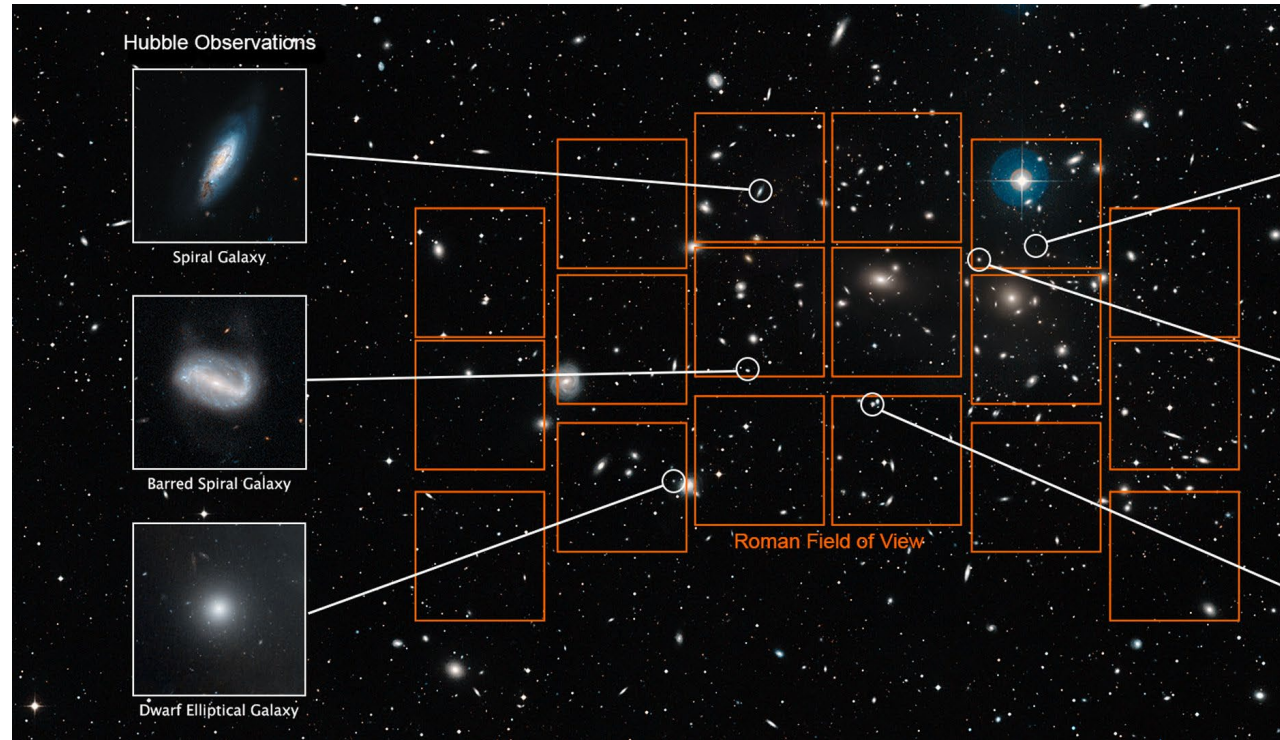
STScI Support of Roman

We want to enable your science!

Specific roles include

- Support for Wide Field Instrument imaging mode
 - Data processing
 - Community interface: user support, documentation, science engagement, public outreach
- Archive and data distribution (all observations)
 - Cloud-based science platform
 - Data + software environment for science analysis
- Planning and scheduling

Help Desk and [RDox](#) are open

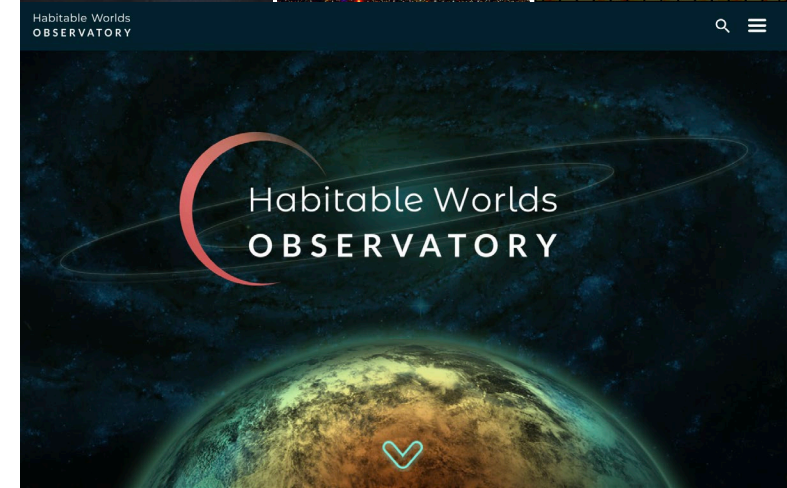
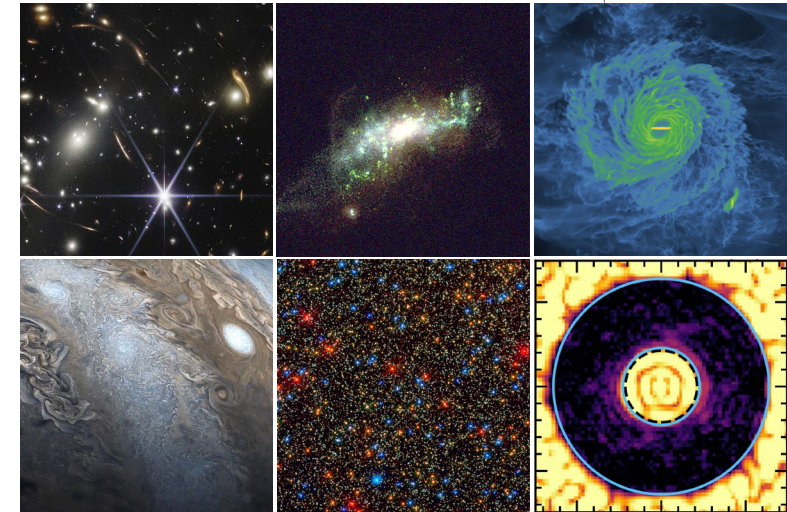
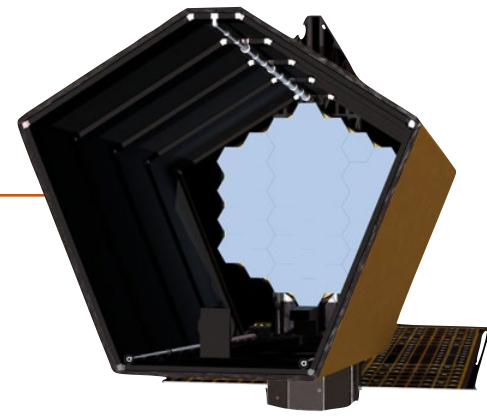


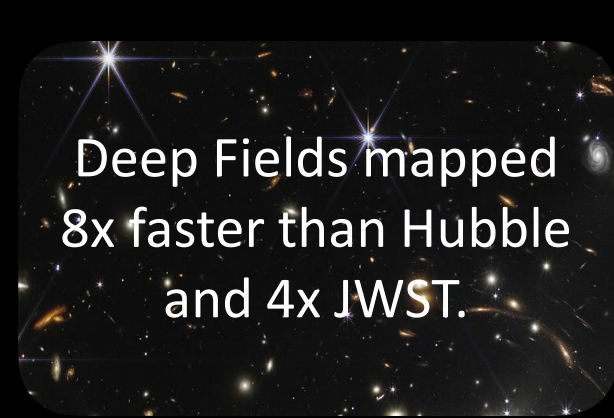
Roman Town Hall, Thursday, 12:45PM, Room 207



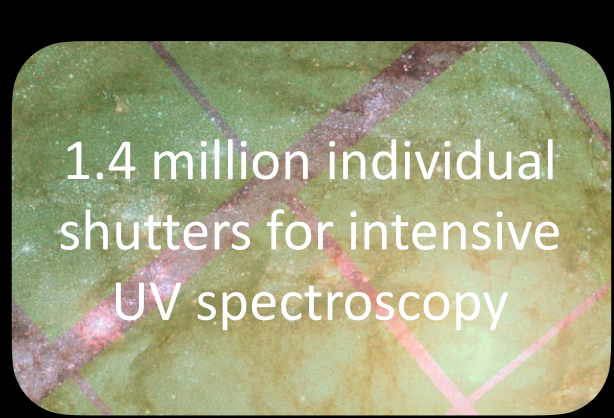
The Habitable Worlds Observatory: STScI activities

- Habitable Worlds Observatory
 - Astro2020 recommendation; large, stable, IR/optical/UV
- NASA leads through the Great Observatories Maturation Program (GOMAP)
- Science, Technology, and Architecture Review Team (START) and Technology Assessment Group (TAG)
- Community participation is essential to capture the most compelling science drivers for HWO. Please contribute your ideas!
- STScI is supporting START, TAG, and the community with a new platform for science case simulation
- Community science case inputs now are critical: START and TAG will use to refine HWO design concepts.
- Details at www.habitableworldsobservatory.org and STScI and NASA booths
- HWO Status and Engagement: Wednesday, 12:45 PM, R08/R09

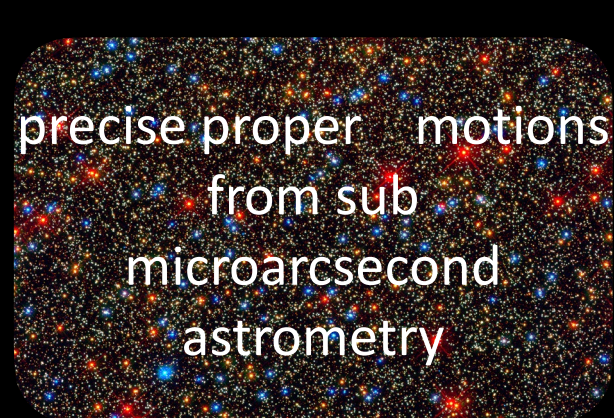




Deep Fields mapped
8x faster than Hubble
and 4x JWST.



1.4 million individual
shutters for intensive
UV spectroscopy



precise proper motions
from sub
microarcsecond
astrometry



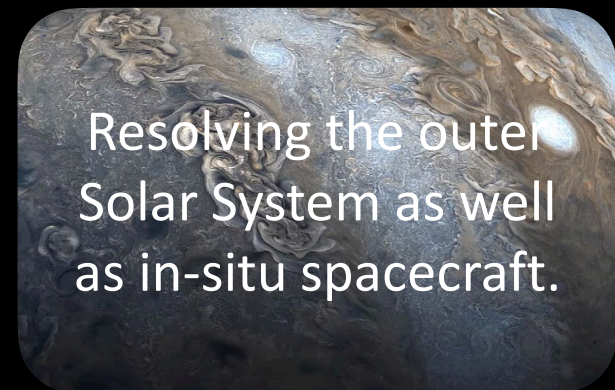
Mapping the baryon
cycle in emission and
absorption.



Reliable photometry
in fields 50x denser
than Hubble

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

Transformative Astrophysics Capabilities



Resolving the outer
Solar System as well
as in-situ spacecraft.




Seeing all the building
blocks of galaxies

HST HWO



28th magnitude point
sources in an hour.

Your idea here!



Servicing to achieve
leaps in instrument
capabilities

www.habitableworldsobservatory.org



Work at STScI!



All jobs announced here: www.stsci.edu/opportunities

Open now, for a range of background and experience:

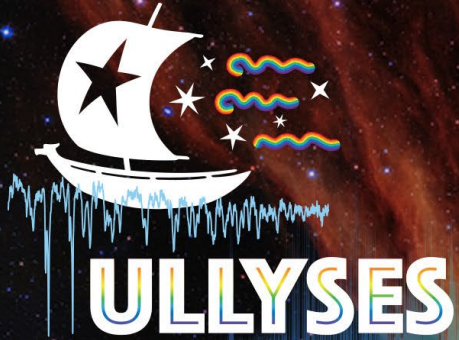
- Science Support Analyst
- Scientific Python Programmer
- Space Astronomy Summer Program ([info](#))
 - undergraduate internships in multiple areas (astronomy research, outreach, engineering)
 - deadline January 26 for summer 2024
- Research postdocs (e.g., exoplanets, star formation, and more!)
- Coming soon: JWST Mission Head

For later:

- STScI Prize Fellowships and related ([info](#))
 - multiple opportunities for independent research and STScI support work
 - typical deadlines late in the calendar year
- More info at the STScI booth



Upcoming conferences and workshops



Continuing the Voyage of Discovery

March 11-14, 2024

RECIPES TO REGULATE STAR FORMATION AT ALL SCALES: FROM THE NEARBY UNIVERSE TO THE FIRST GALAXIES

15-19 April 2024, STScI, Baltimore (USA)



Science with the Hubble and James Webb Space Telescopes VII: Stars, Gas & Dust in the Universe

29 April–
2 May
2024





Welcome Jennifer Lotz!



STScI Director Jennifer Lotz, starting in mid-February