



**STScI** | SPACE TELESCOPE  
SCIENCE INSTITUTE

EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

# Hubble Space Telescope Cycle 27 Time Allocation Committee

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**Kenneth Sembach**

**June 9, 2019**



## Welcome to the Hubble Cycle 27 TAC

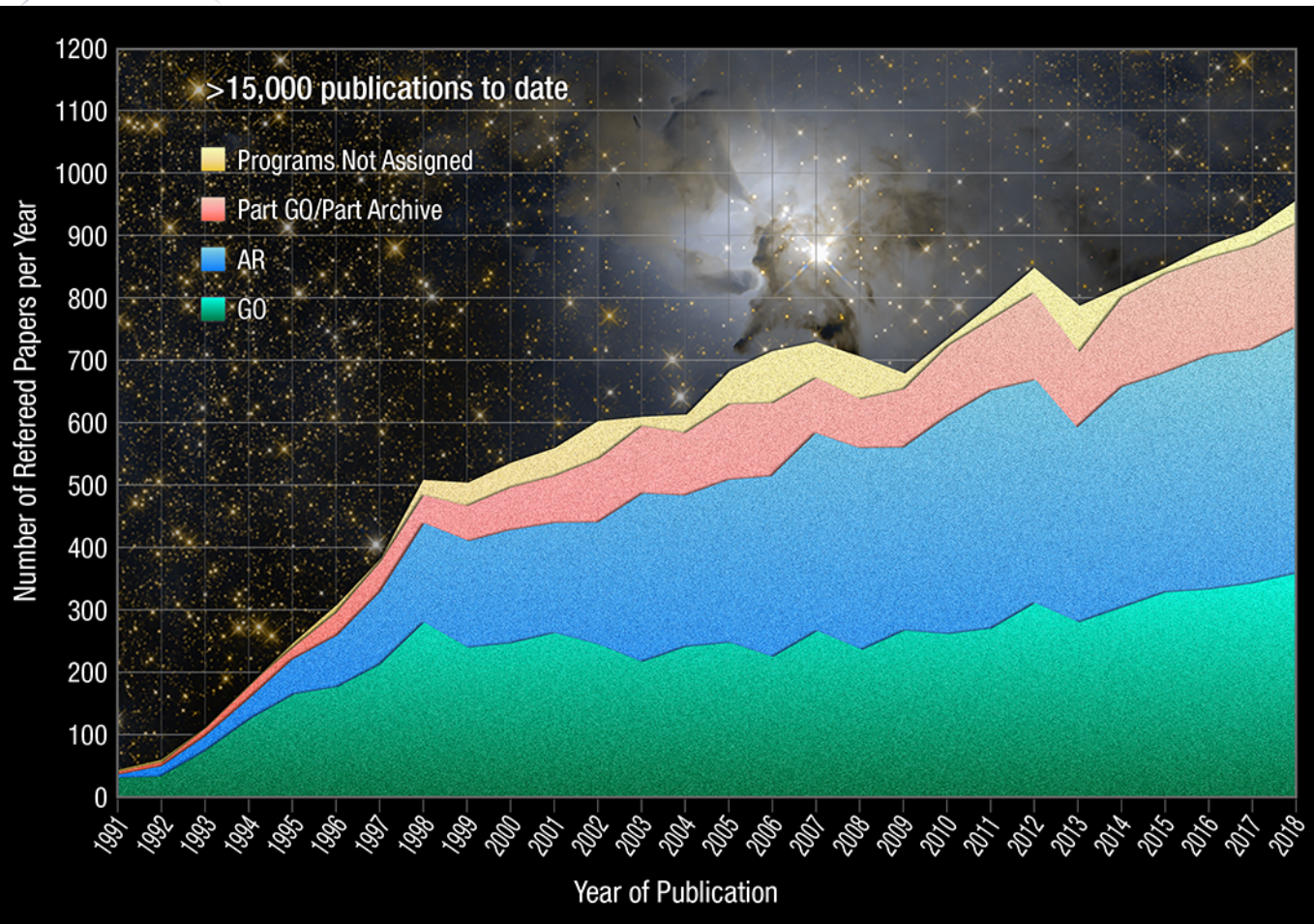
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# Hubble Science Productivity



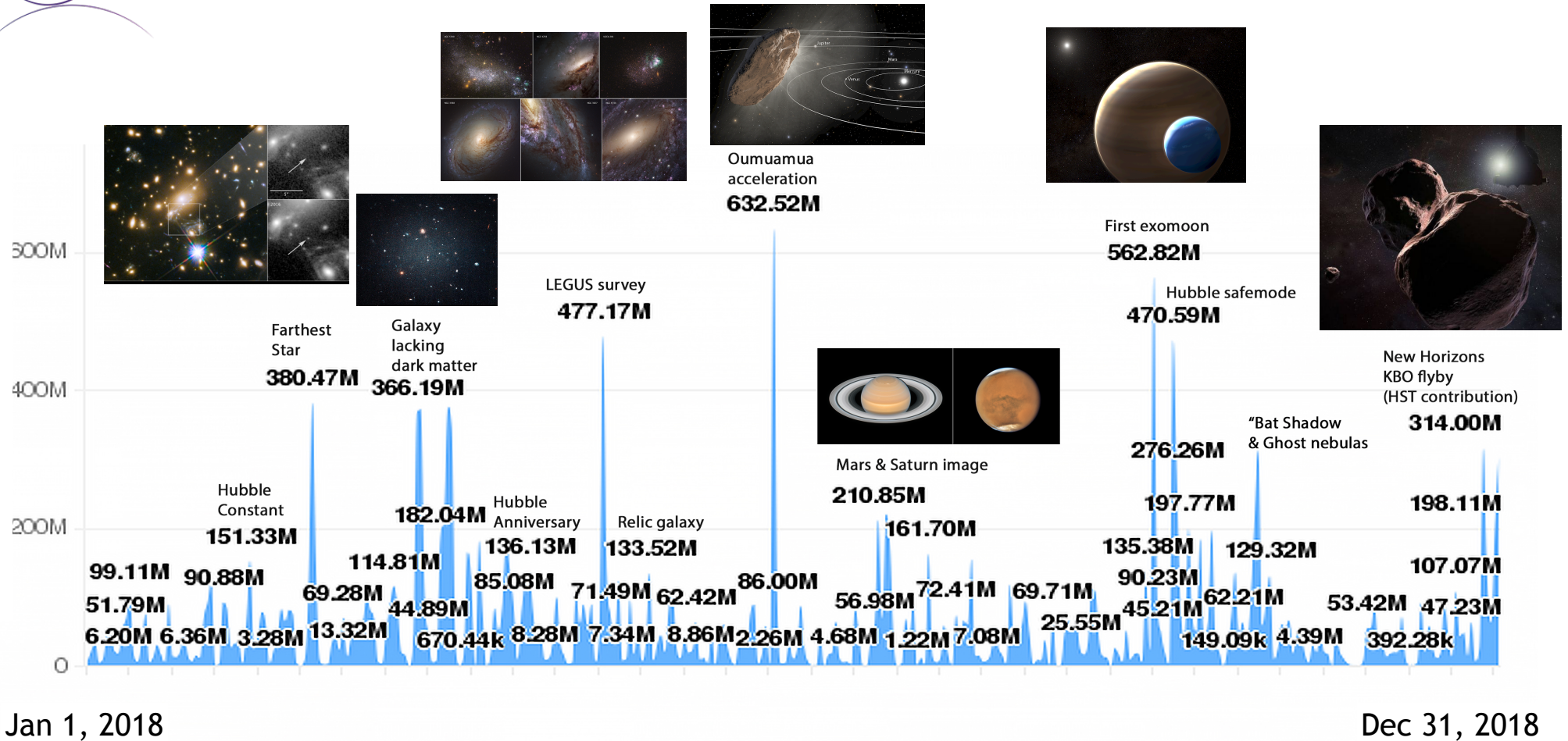
- 950+ refereed science papers/yr
- 16,000+ refereed science papers
- 800,000+ citations
- 600+ PhD theses
  - Currently ~1 per week
- 2+ published papers per day
- 1 in 6 astronomy papers use Hubble data
- Hubble h-index nearing 300

Year	2016	2017	2018
h-index	257	274	288



# Outreach – Press Release Impact

Estimated millions of readers



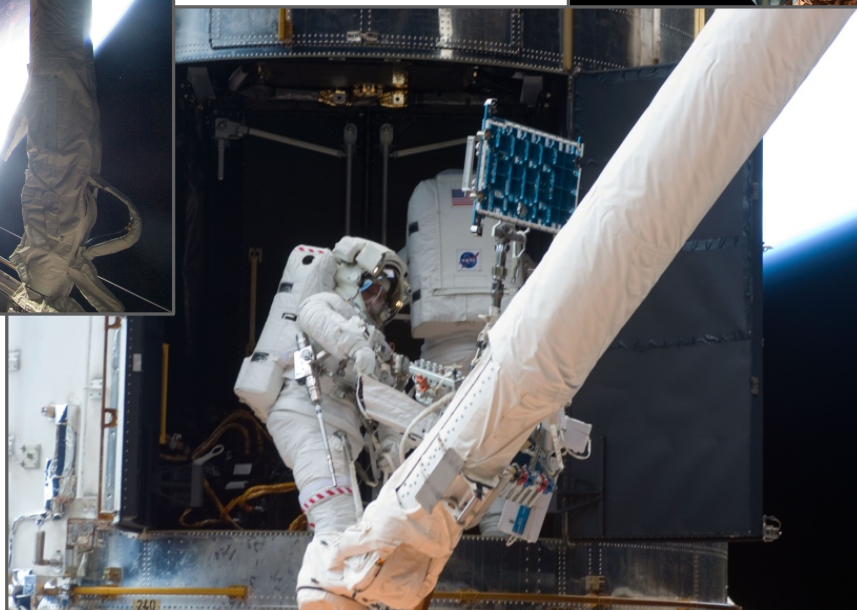
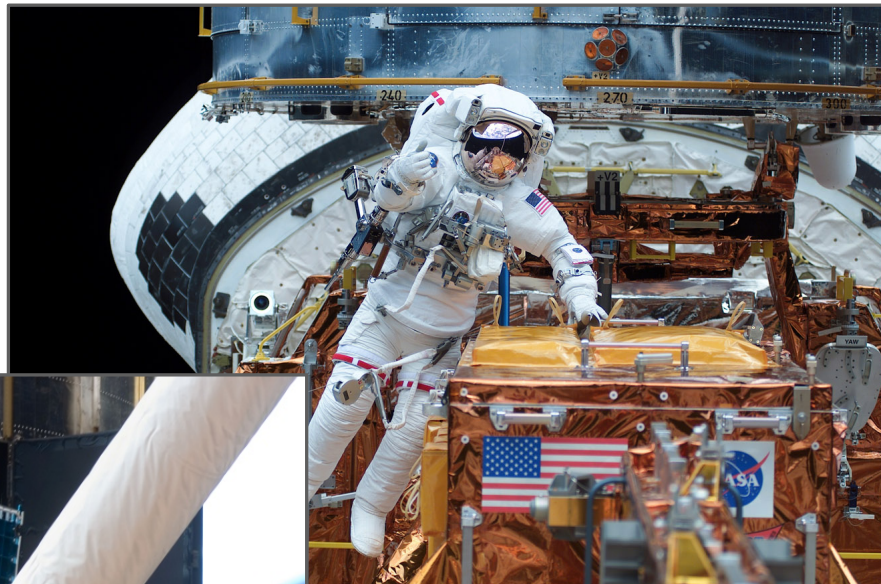
Jan 1, 2018

Dec 31, 2018





## Ten years since SM4 - 1/3 of Hubble's time in space





## UV Legacy Library of Young Stars as Essential Standards (ULLYSES)



- High-mass stars: star formation on extragalactic and galactic scales, essential role in galaxy evolution across cosmic time
- Low-mass stars: home of planetary systems, most of stellar mass in the universe
- Both high- and low-mass young stars (<10 MY) have complex UV spectra, difficult to model, important for topics ranging from cosmic reionization to Earth's origin

**~1000 orbits of DD time in Cycles 27-29**

Cosmic origins from large to small scales

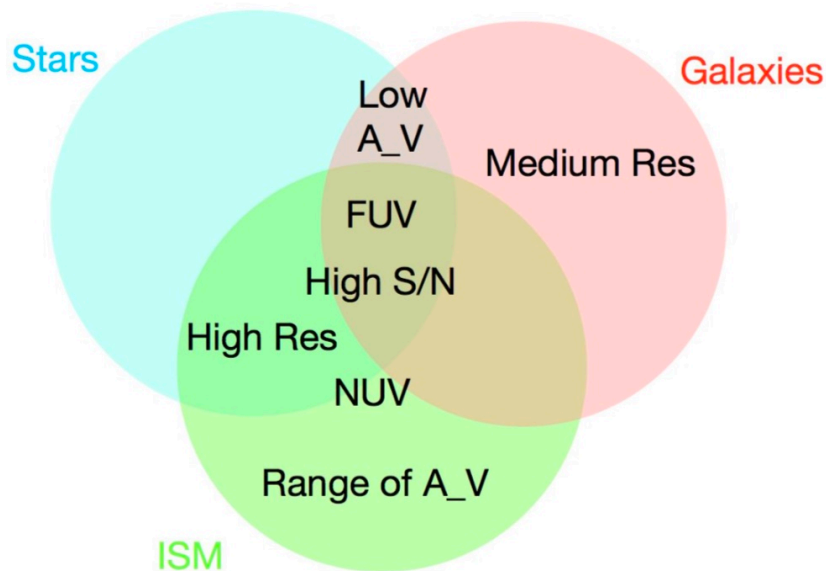
Understand complexity of UV spectra

Definitive dataset on first 10 MY of stellar evolution





## UV Legacy Library of Young Stars as Essential Standards (ULLYSES)



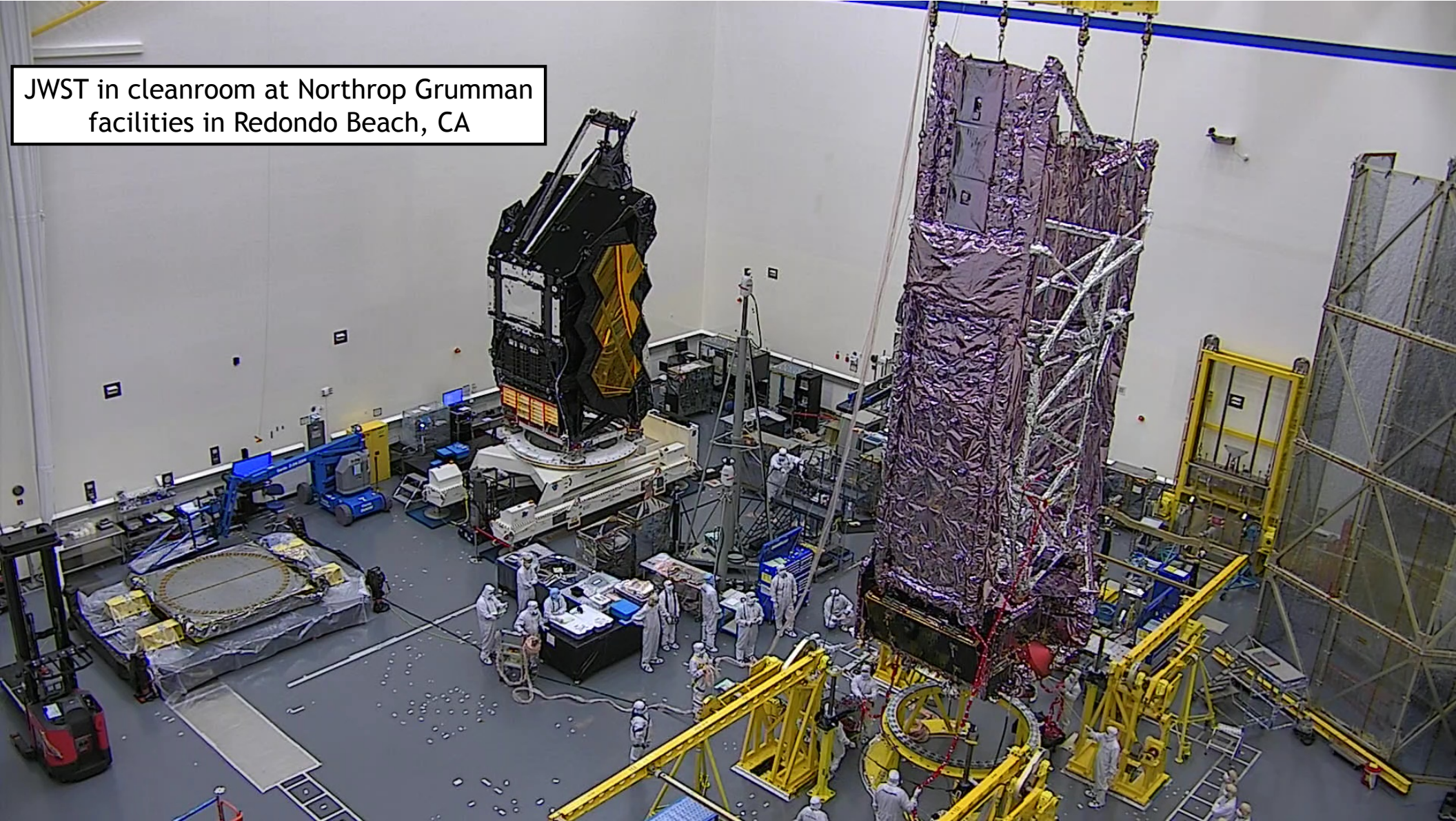
- Enables additional studies of ISM, CGM, jets, and exoplanet science
- Working group identified candidate targets, relevant archival data. Target list to be finalized after Cycle 27 TAC
- Implementation Team will verify optimal grating setups, target acquisition, parallel programs
- Coordinated observations, legacy archive, web pages for dissemination

Cosmic origins from large to small scales

Understand complexity of UV spectra

Definitive dataset on first 10 MY of stellar evolution

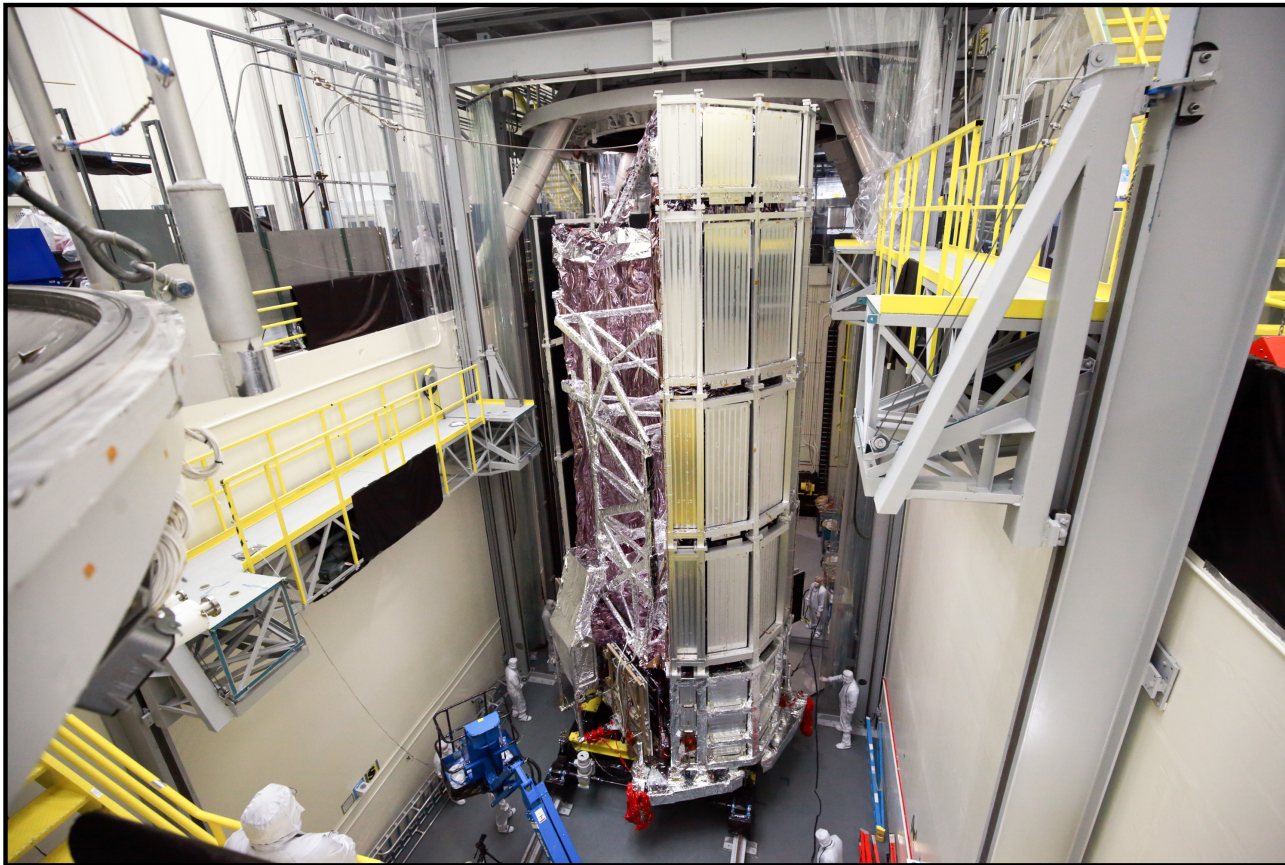
JWST in cleanroom at Northrop Grumman facilities in Redondo Beach, CA







## JWST spacecraft/sunshield after final thermal-vacuum test

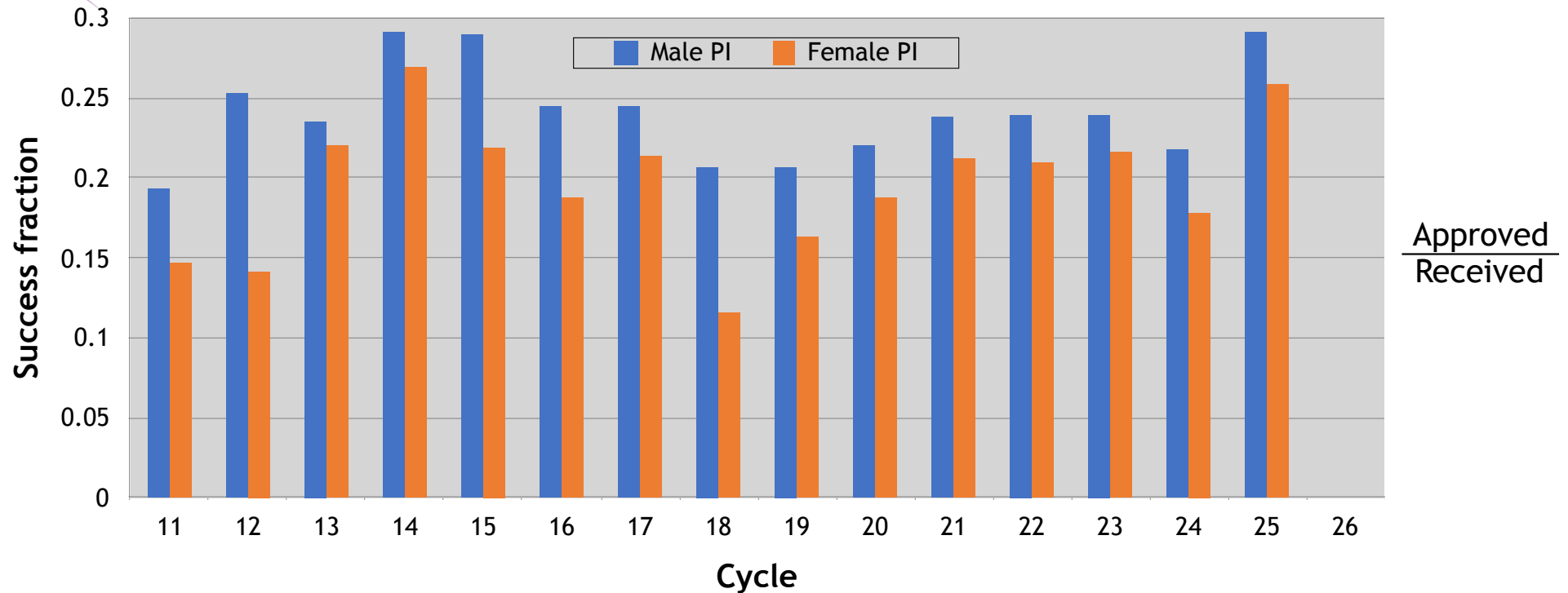


Technicians and engineers needed to take special precautions when preparing, and transporting Webb's spacecraft element for entry into Northrop Grumman's environmental testing chambers.

Credits: Northrop Grumman



## Gender and HST proposal selection statistics

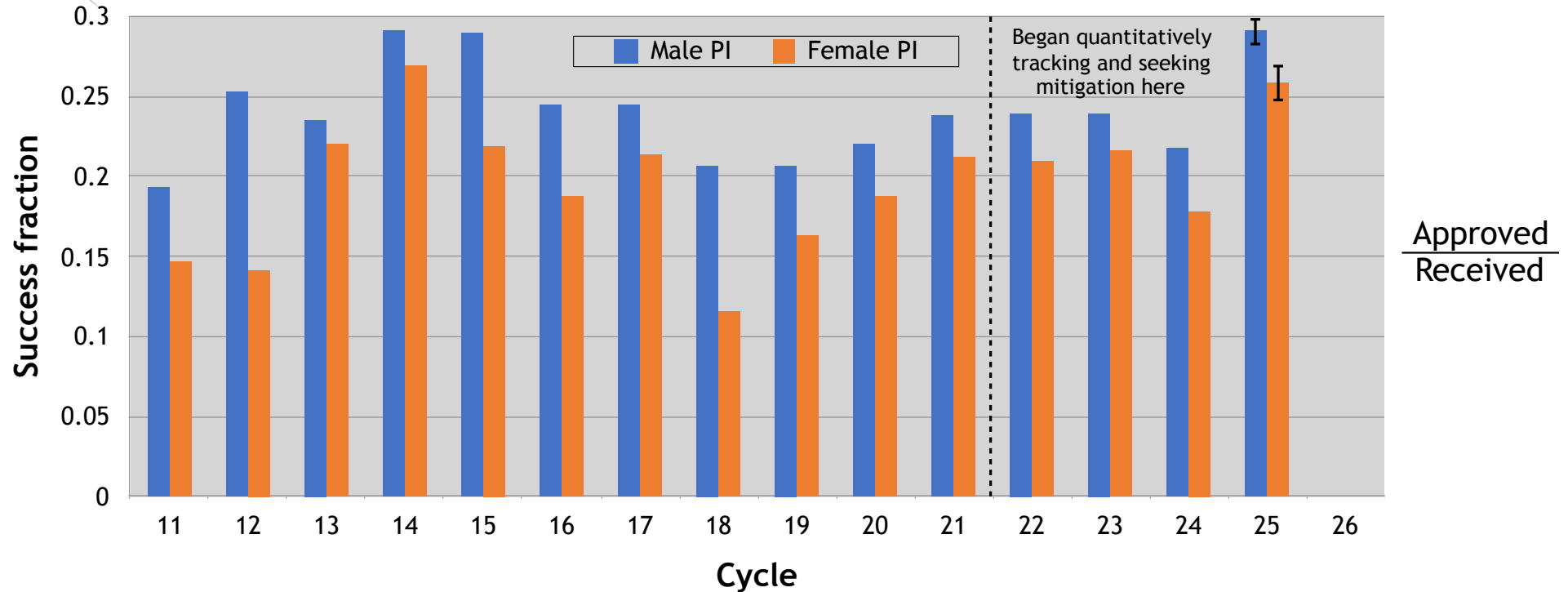


HST proposals led by male principal investigators have had a consistently higher success rate than those led by female principal investigators.





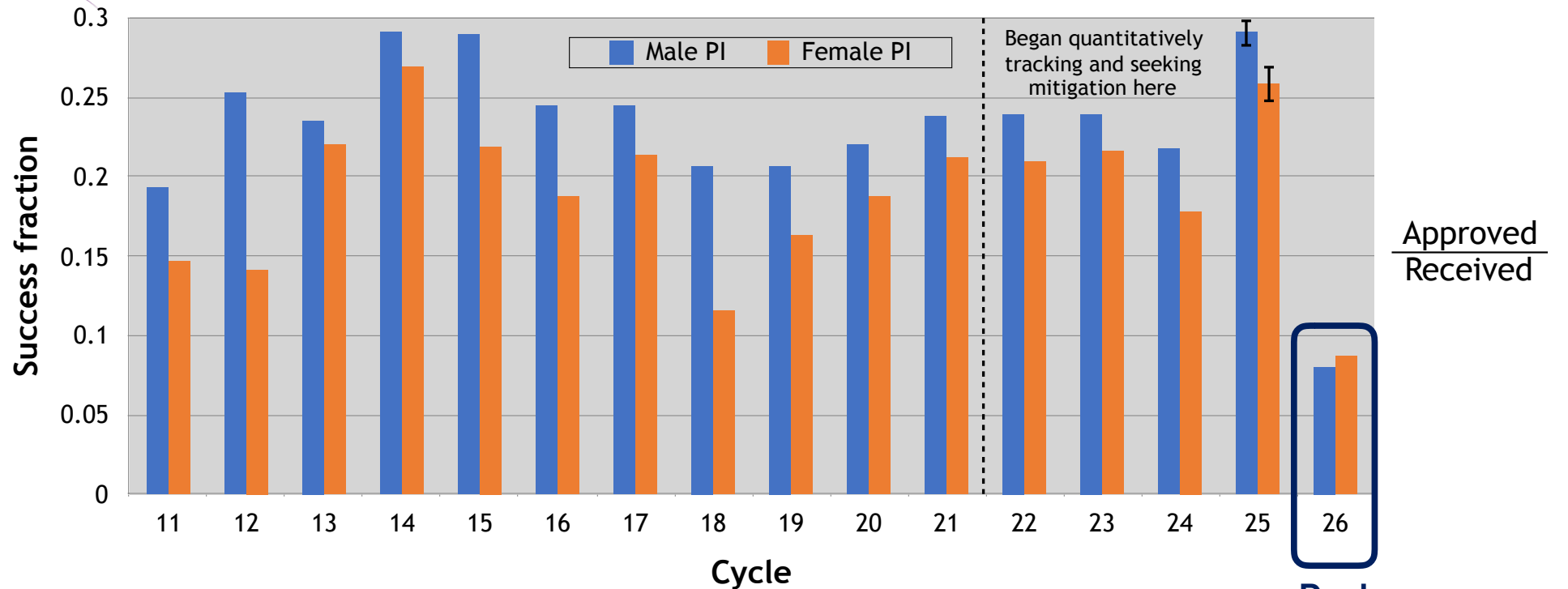
## Gender and HST proposal selection statistics



Success fraction offset is roughly within random noise in individual observing cycles, but has a strong significance integrated over many cycles.



## Gender and HST proposal selection statistics



Cycle 26 outcome is encouraging.  
Keep in mind that this is only a single data point.

Dual anonymous  
review





## Many biases can be mitigated through dual anonymous reviews

**Gender**

**Institution type or size**  
**Prestige (reputation)**  
**Previous success**  
**Seniority**  
**Ethnicity & culture**  
**Geographic location**



National Aeronautics and  
Space Administration  
**Headquarters**  
Washington, DC 20546-0001



June 7, 2019

To: Distribution (Astrophysics GO Leads)  
From: SMD/Director of Astrophysics  
Re: Dual Anonymous Peer Reviews for Astrophysics GO Programs

In June 2018, the Space Telescope Science Institute (STScI) conducted a dual anonymous peer review for Cycle 26 of the Hubble General Observer (GO) program<sup>1</sup>. The dual anonymous peer review addresses many issues of implicit bias. STScI's implementation of dual anonymous peer review was successful in Cycle 26. During June 2019, STScI will be conducting the Hubble Cycle 27 peer review, again using the dual anonymous process. STScI and NASA will review the Cycle 27 experience and outcomes to assess the dual anonymous practice.

In the absence of any contra-indications from the Hubble Cycle 27 peer review, I am directing all NASA Astrophysics GO programs to use dual anonymous peer reviews beginning in CY 2020.

In order to provide all NASA Astrophysics GO program leads with the benefit of STScI's experience, STScI will host a workshop in Fall 2019 to share their practices, lessons learned, and extant documentation with all other missions.

If you have any questions, please address them to your HQ Program Scientist or to me.

A handwritten signature in blue ink, appearing to read "P. Hertz".

Paul Hertz  
Director, Astrophysics Missions  
Science Mission Directorate





**Thank you for making Hubble so successful!**

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