



STScI | SPACE TELESCOPE
SCIENCE INSTITUTE

EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

STScI Town Hall

Kenneth Sembach

Director

January 2020 AAS Meeting

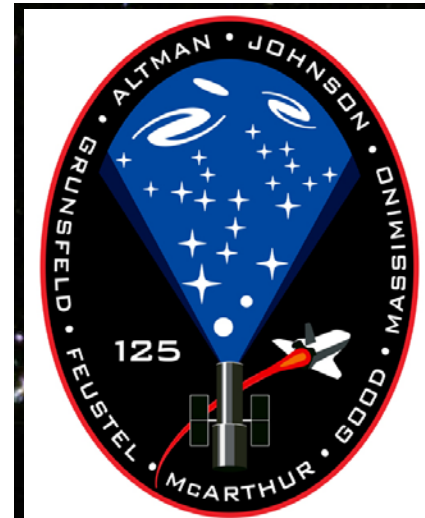


10+ Years Since Servicing Mission 4 – 1/3 of Hubble's Time in Space

Shuttle Mission: STS-125

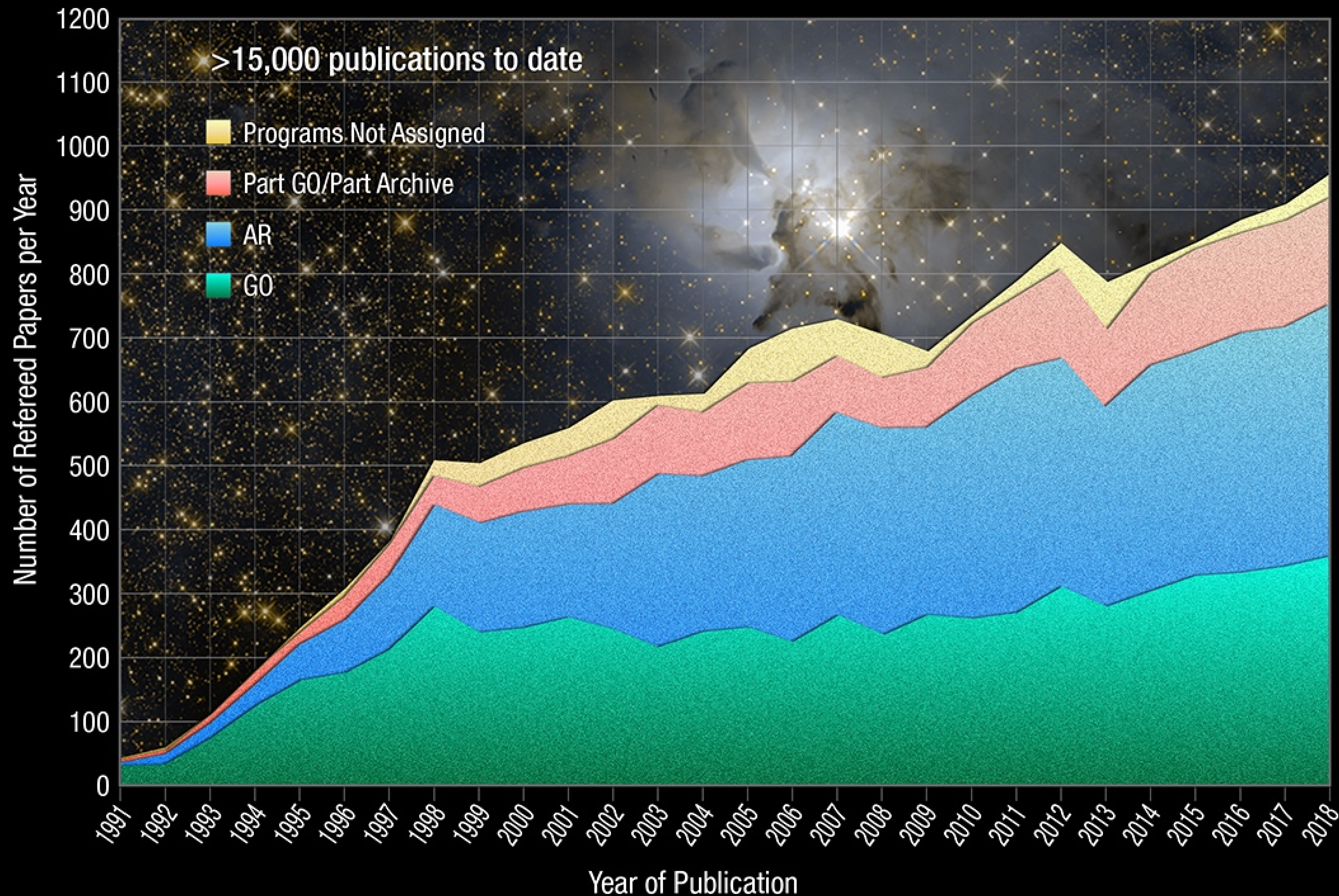
Shuttle: Atlantis

Date: May 11-24, 2009





Hubble's Science Productivity Continues to Climb



- 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

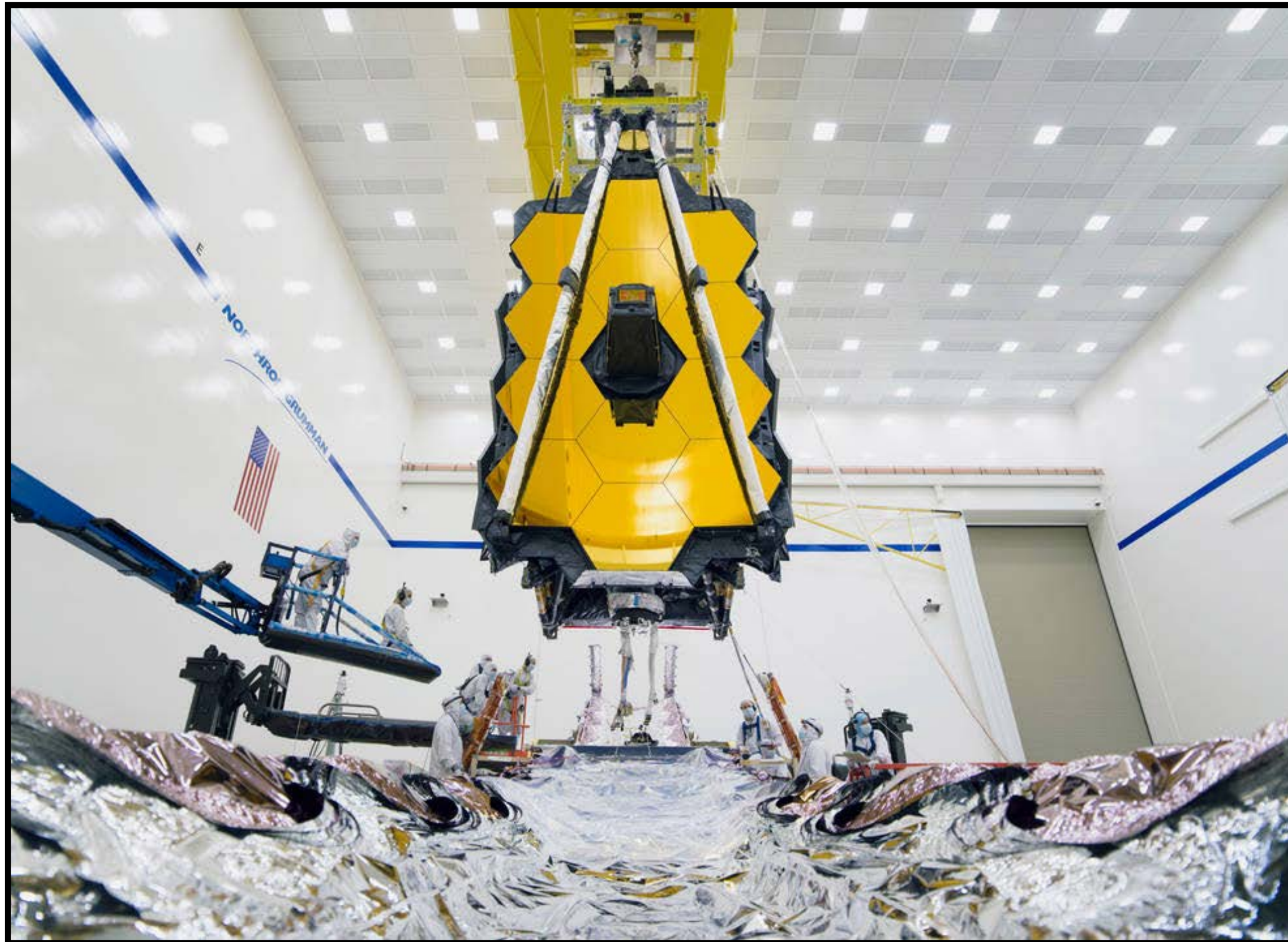


Hubble Space Telescope

- Hubble is expected to enable forefront science and contemporaneous observations with JWST well into the mid-late 2020s.
- Hubble is expected to stay in three-gyro mode for at least several years, and reduced gyro mode for many years after that.
- Development is underway to obtain better performance with the current suite of gyros.
- Development is underway to extend COS lifetime even further (2025+).
- We are looking at ways to enable more timely responses to transient phenomena (e.g., gravitational wave event follow-up) and exoplanet discoveries with TESS.
- The ULLYSES program will explore star-formation in nearby universe using ~1000 orbits of DD time, exploiting Hubble's unique UV capabilities.



Integration of JWST Telescope Assembly and Spacecraft Element



Integration teams carefully guide Webb's suspended telescope section into place above its Spacecraft Element just prior to integration.

Credits: NASA/Chris Gunn

Video at: <https://youtu.be/a0hyeOH9TiE>



10/9/19: Membranes Tensioned

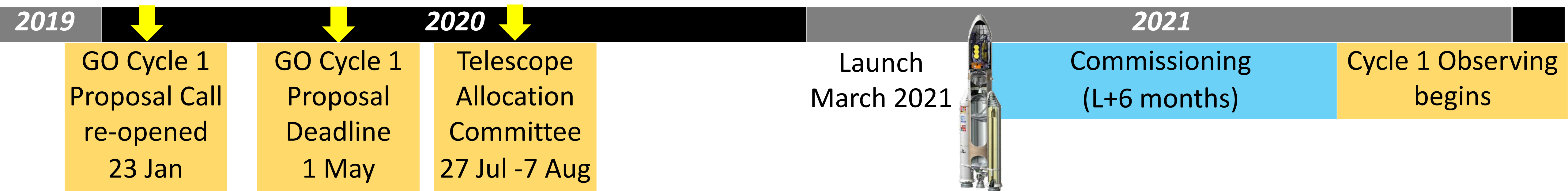
NORTHROP GRUMMAN





The JWST Science Program Is Moving Forward

- Proposals from the Guaranteed Time Observers and the Early Release Science (ERS) teams have already been received and are being processed.
- STScI is actively working with the astronomy community, which is preparing to propose for and conduct science with JWST.
- The General Observing (GO) call for proposals in January 2020 begins a very active period that drives a significant portion of STScI's work:
 - Proposal ingest, verification and review, observation planning and scheduling
 - On-going interaction with the astronomy community and peer review





James Webb Space Telescope

- Following the recommendations of the JSTUC, the Cycle 1 schedule is final and not subject to change.
- There is a significant learning curve associated with JWST proposing. We encourage use of the online tutorials, online user documentation (JDox), and the JWST Help Desk early in the planning and crafting of proposals.
- Consider attending one of the three open house splinter sessions on JWST observation planning (IFUs, grism spectroscopy, multi-object spectroscopy).
- Find and register for a Master Class workshop in your neighborhood. See the STScI booth for more details.
- Good luck with your proposals!



Leading by Including...



Dual
ANONYMOUS
Reviews Workshop
25-September-2019

Lessons learned and best practices at STScI

NASA (astrophysics GO), ESA, NRAo, ALMA,
AURA (Gemini, NOAO, DKIST, LSST), and ESO invited

INCLUSIVE ASTRONOMY 2

October 14–15, 2019

Baltimore • MD

Space Telescope Science Institute

*All students,
astronomers, social
scientists, policy makers,
and advocates:*

Come take part in a community discussion to build upon the 2015 Nashville Recommendations, reflect on the state of the profession, address issues affecting underrepresented groups, and envision how to improve astronomy into the 2020s.

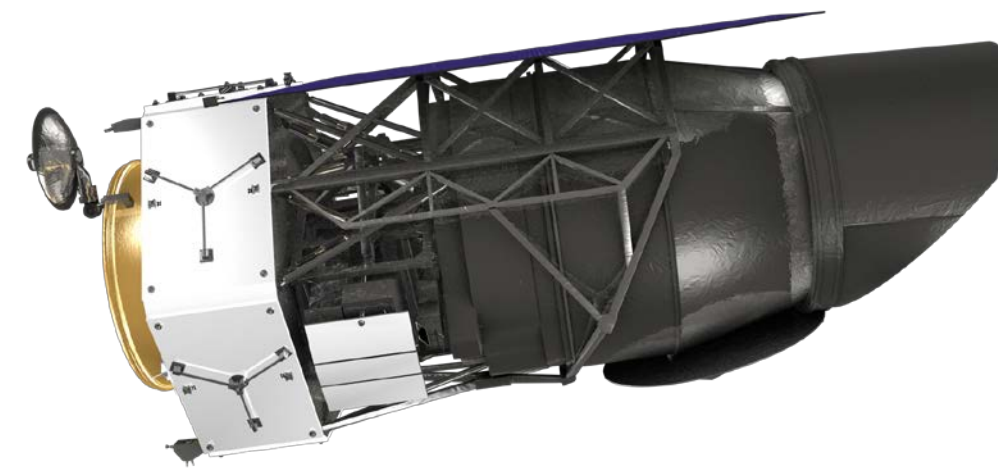
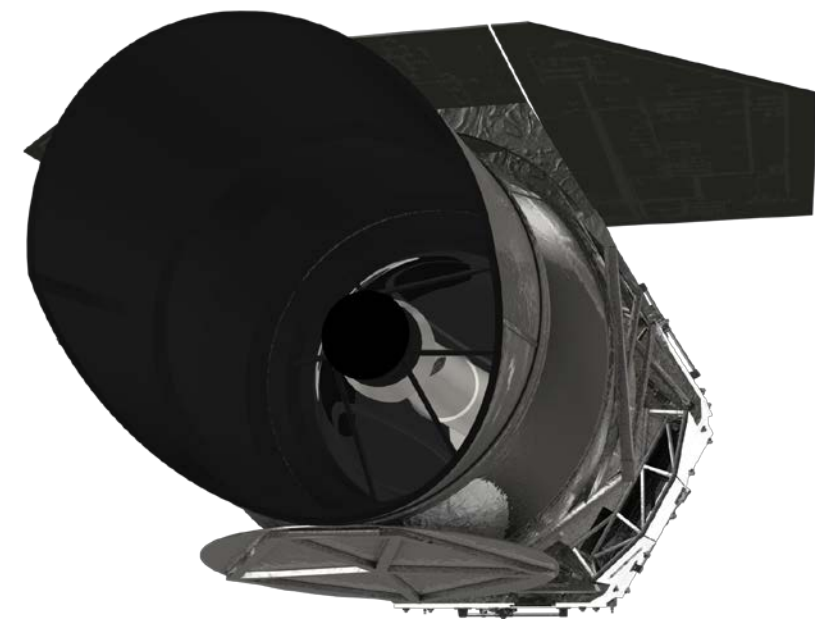
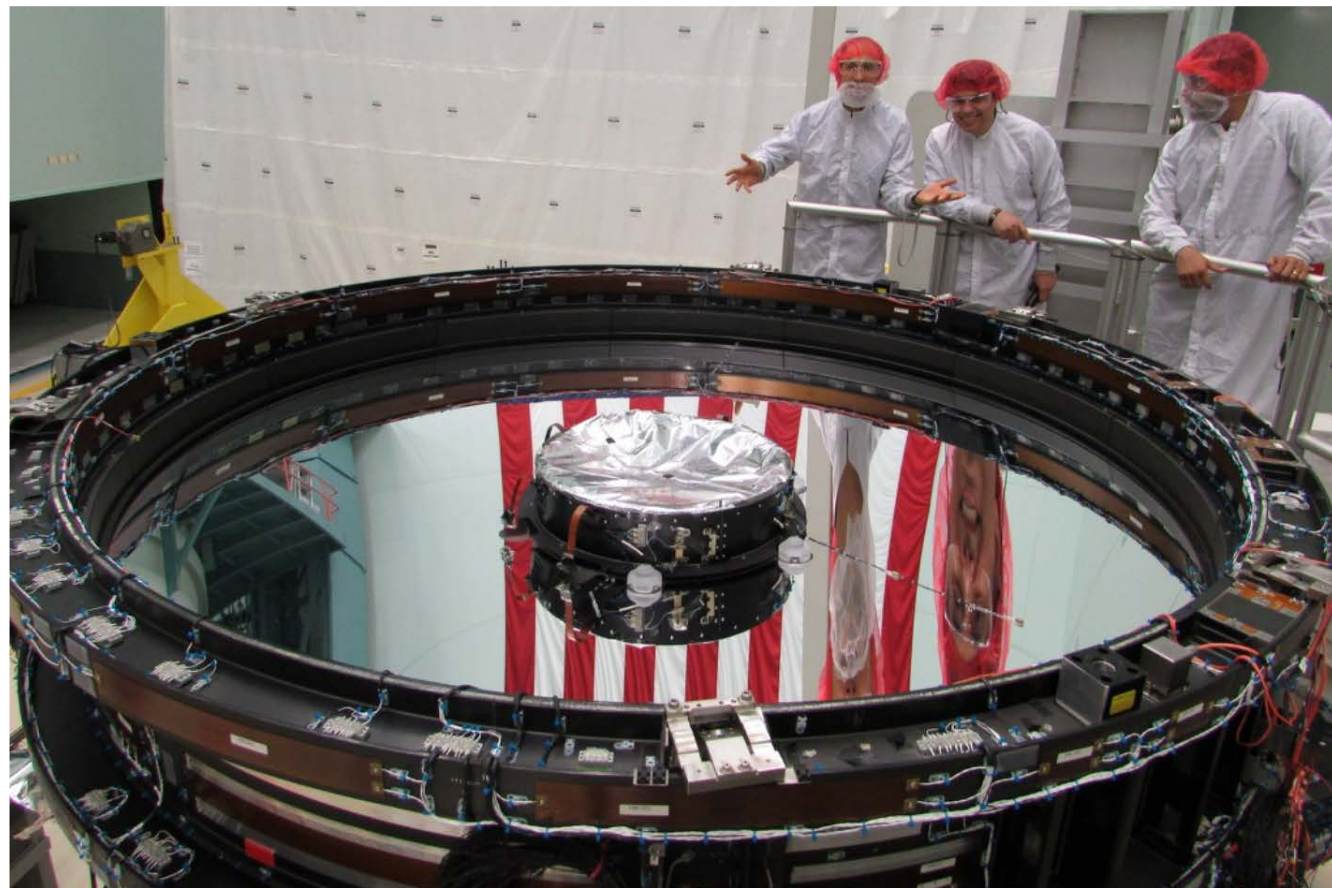
www.tiny.cc/InclusiveAstro2 • Inclusion2@stsci.edu





The Wide Field Infrared Survey Telescope at a Glance

The Telescope Hubble-sized 2.4m Telescope



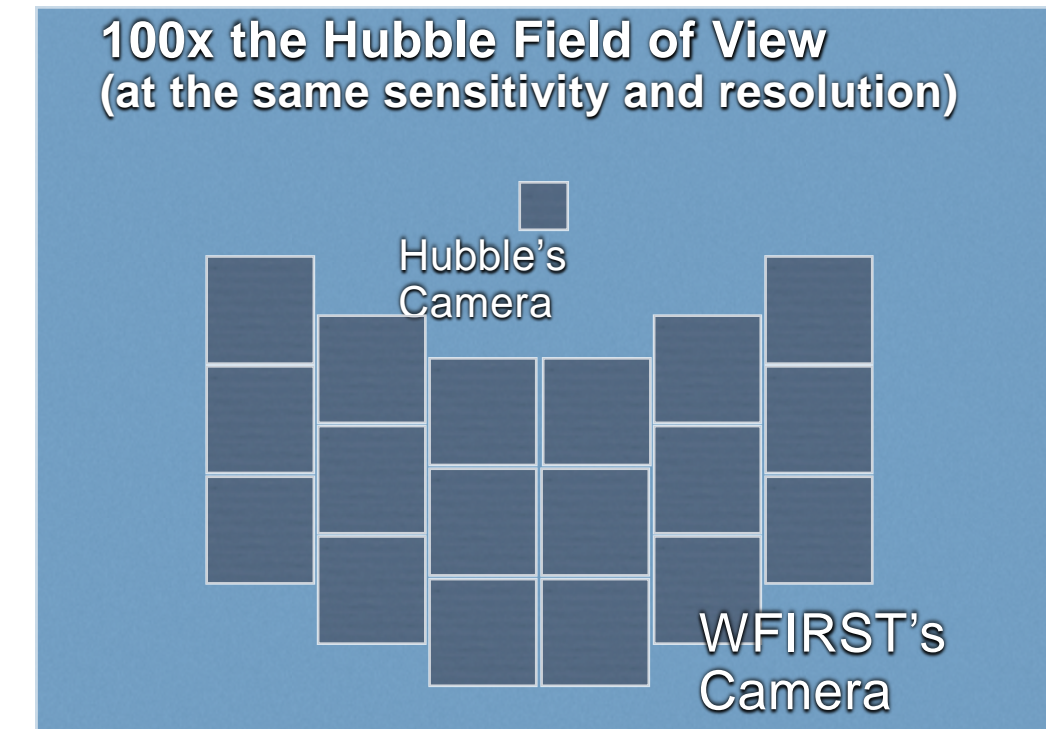
The Instruments Wide Field Instrument and Coronagraphic Technology Demonstration Instrument



Wide Field Instrument



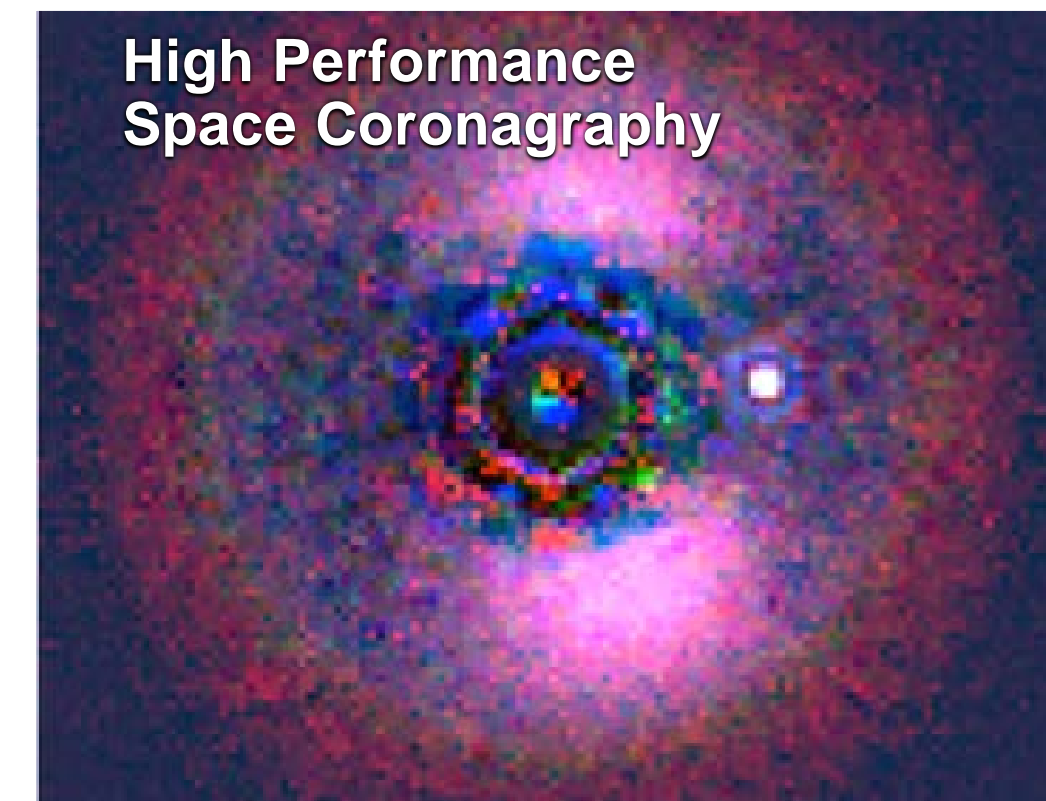
Tech-Demo Coronagraph



100x the Hubble Field of View
(at the same sensitivity and resolution)

Hubble's
Camera

WFIRST's
Camera



High Performance
Space Coronagraphy

The Partners



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Plus Industry, International, and Academic Partners

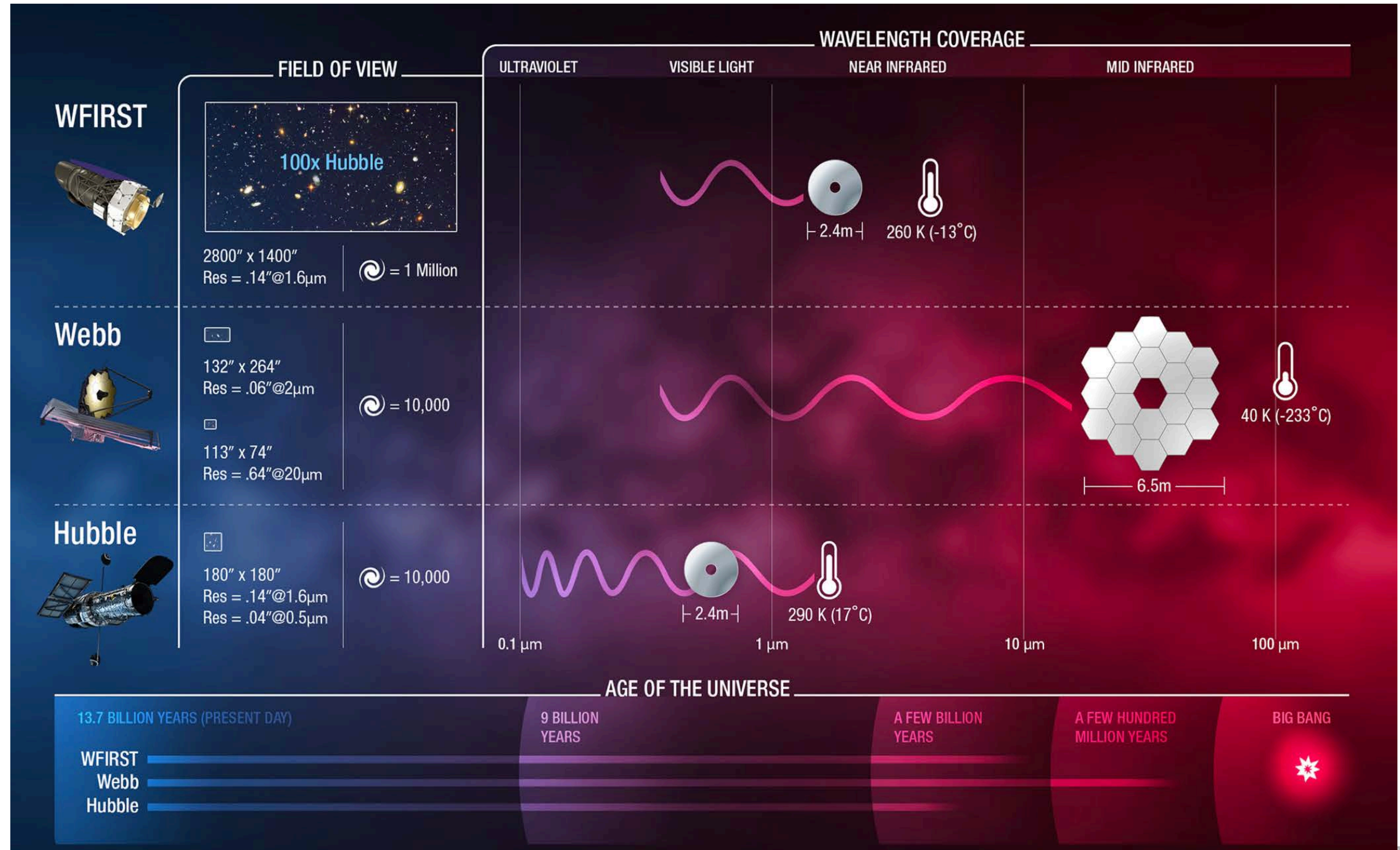


WFIRST: NASA's Wide-Field Astrophysics Great Observatory

WFIRST is capable of wide-area imaging at Hubble-like sensitivity and resolution.

Mission science goals include understanding dark energy, conducting an exoplanet census, and opening discovery space for a wide range of astrophysical topics.

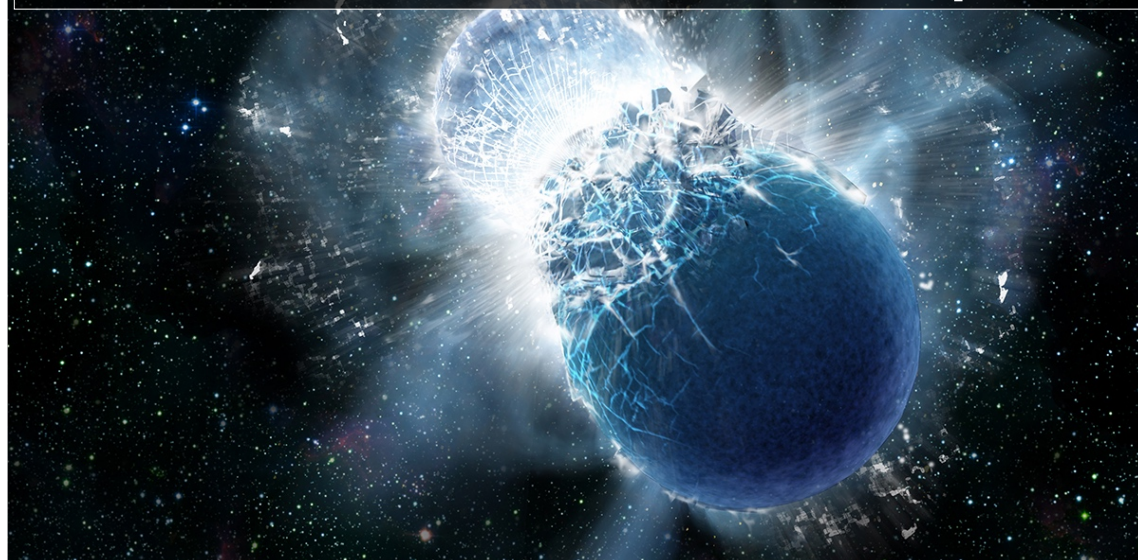
All WFIRST observations will be competitively selected through peer review.



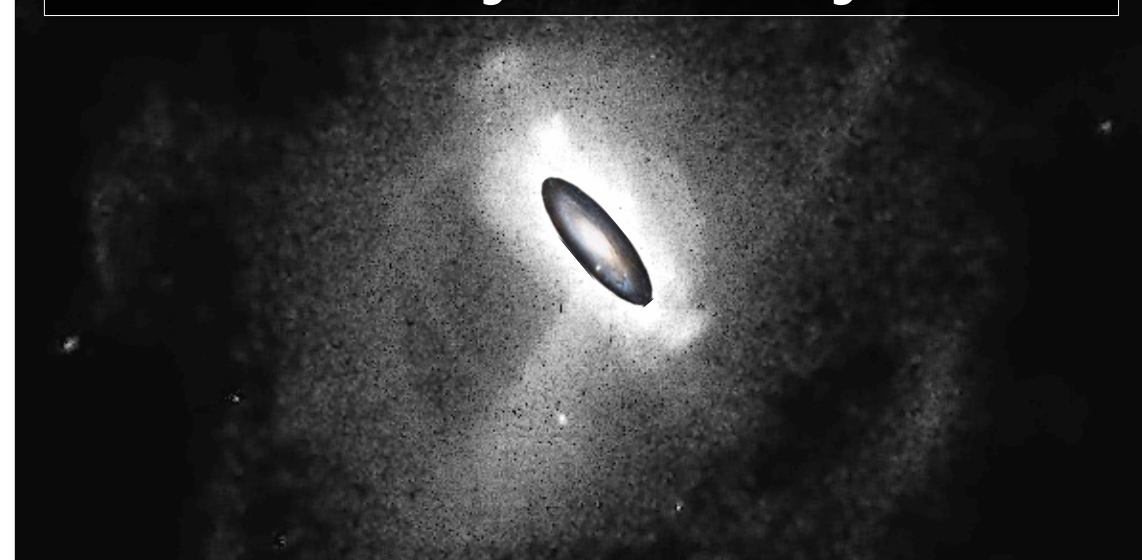


Great Observatory Science with WFIRST

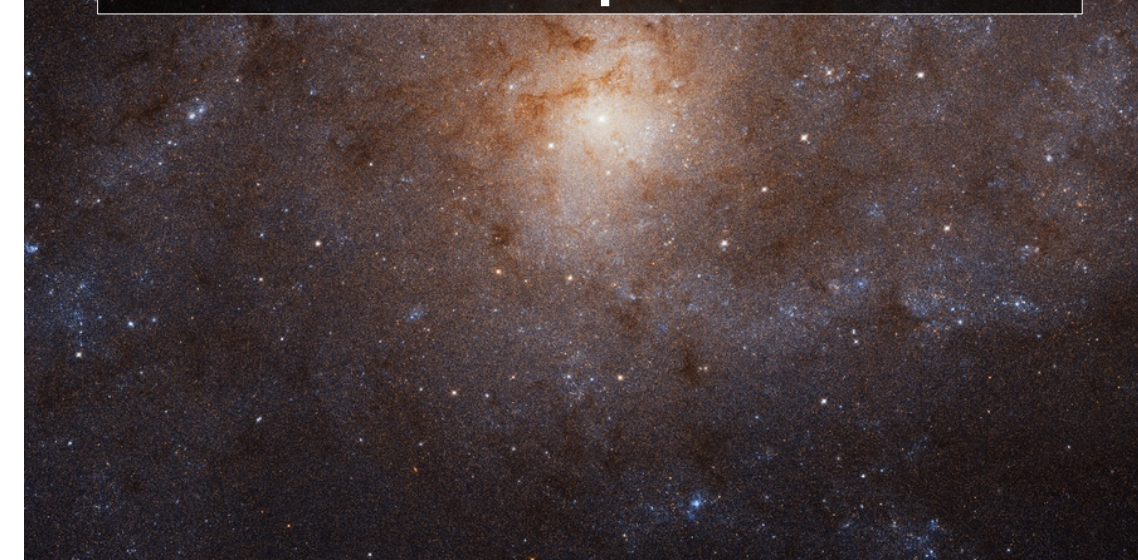
Gravitational Wave Counterparts



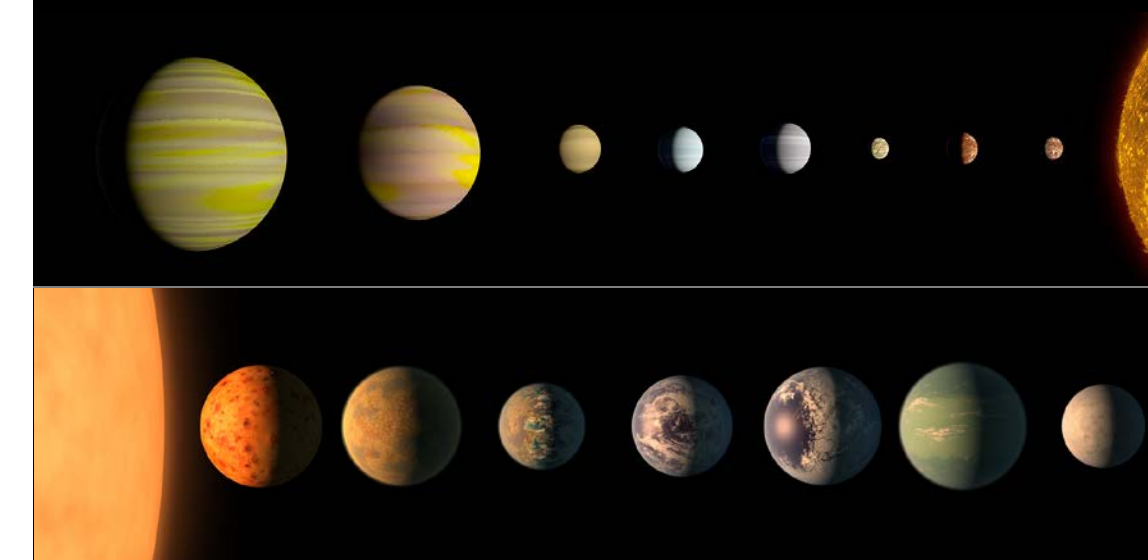
Galaxy Assembly



Stellar Populations



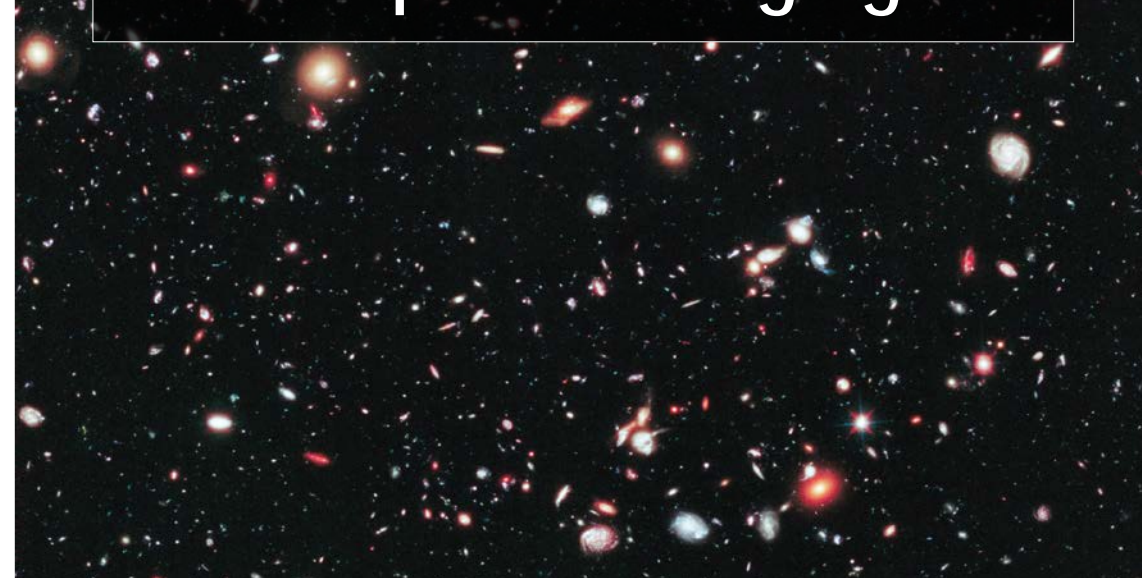
Planetary System Diversity



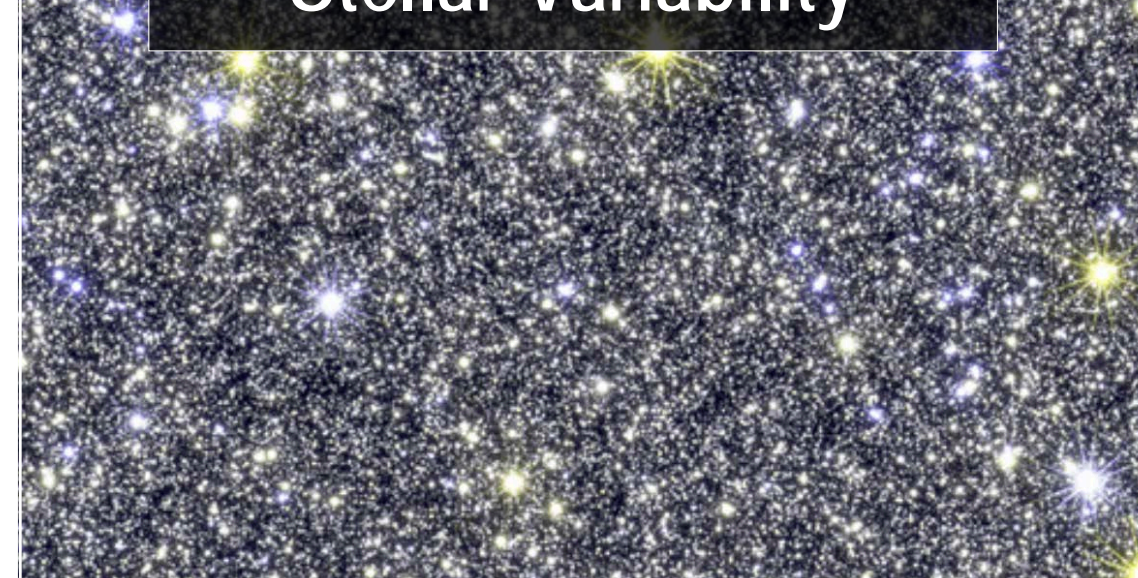
Expansion of the Universe



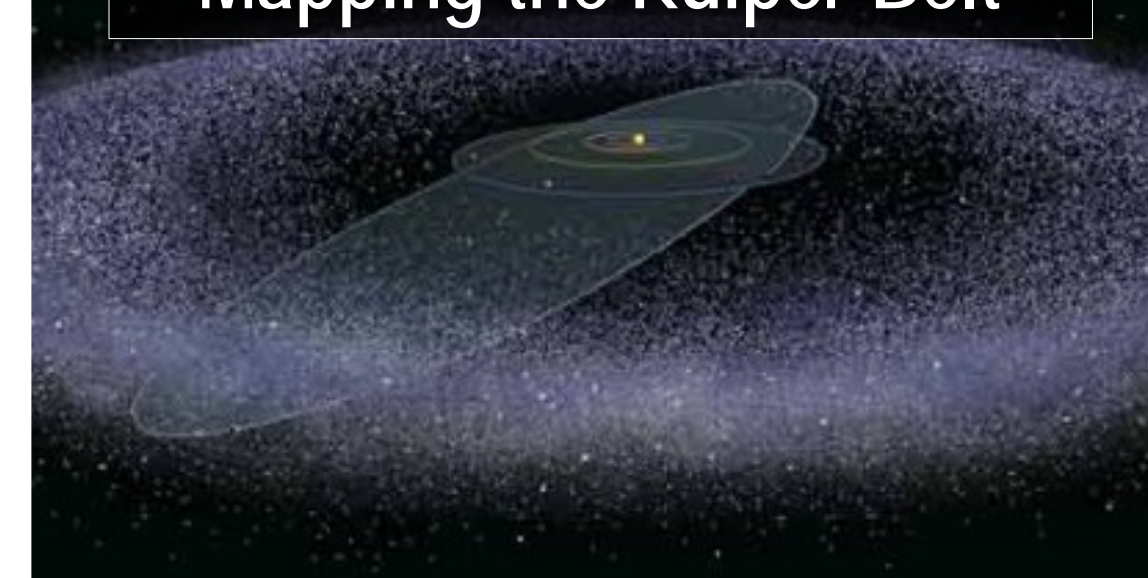
Deep Field Imaging



Stellar Variability



Mapping the Kuiper Belt



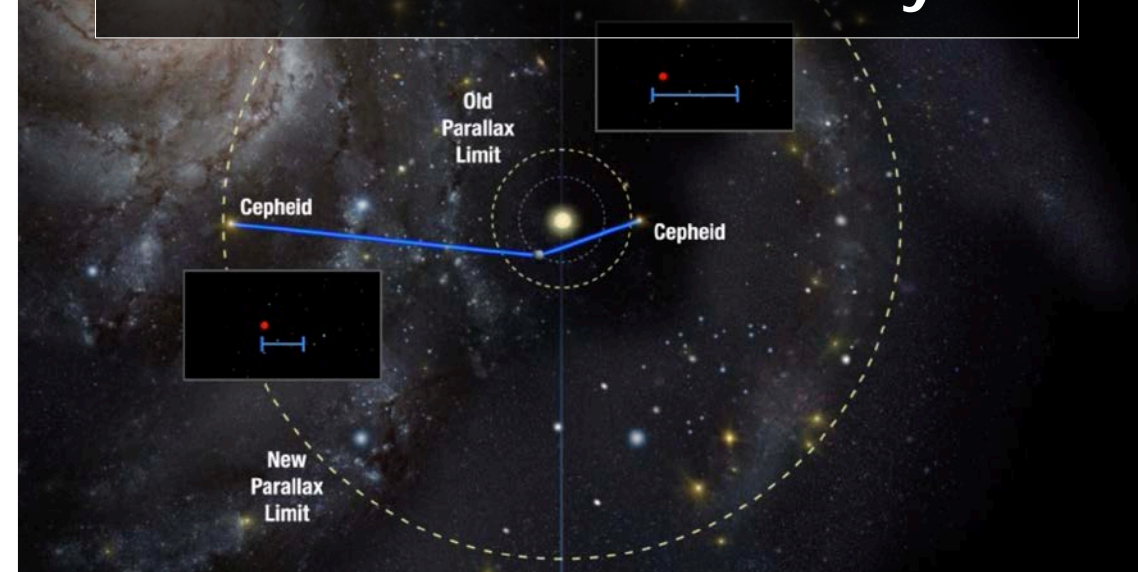
Dark Matter Mapping



Galaxy Evolution



Precision Astrometry



Circumstellar Disk Imaging



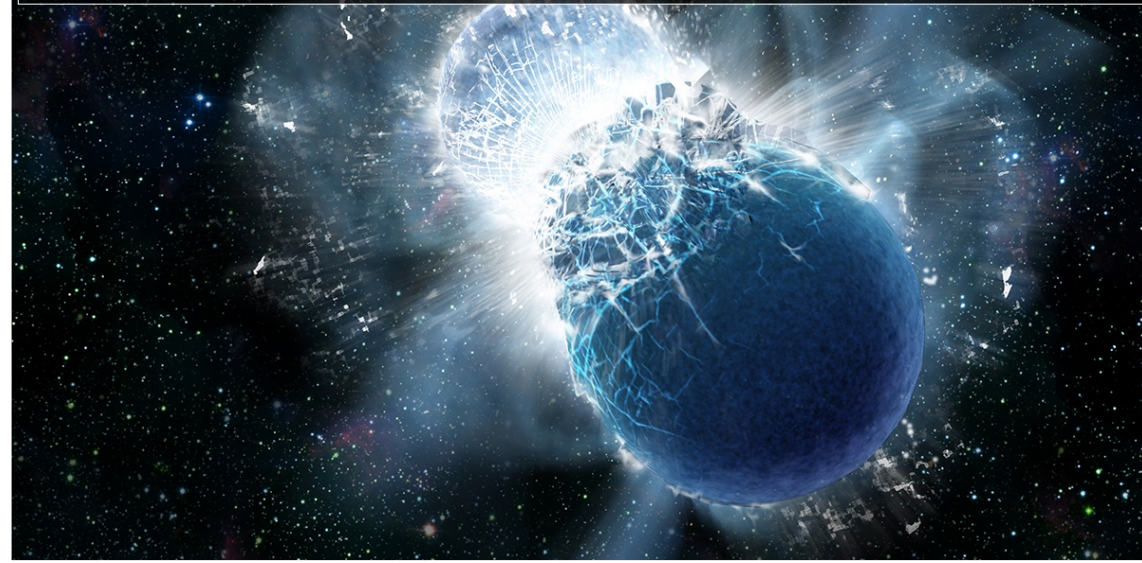
A Universe of Fundamental Physics

Galaxies By the Millions

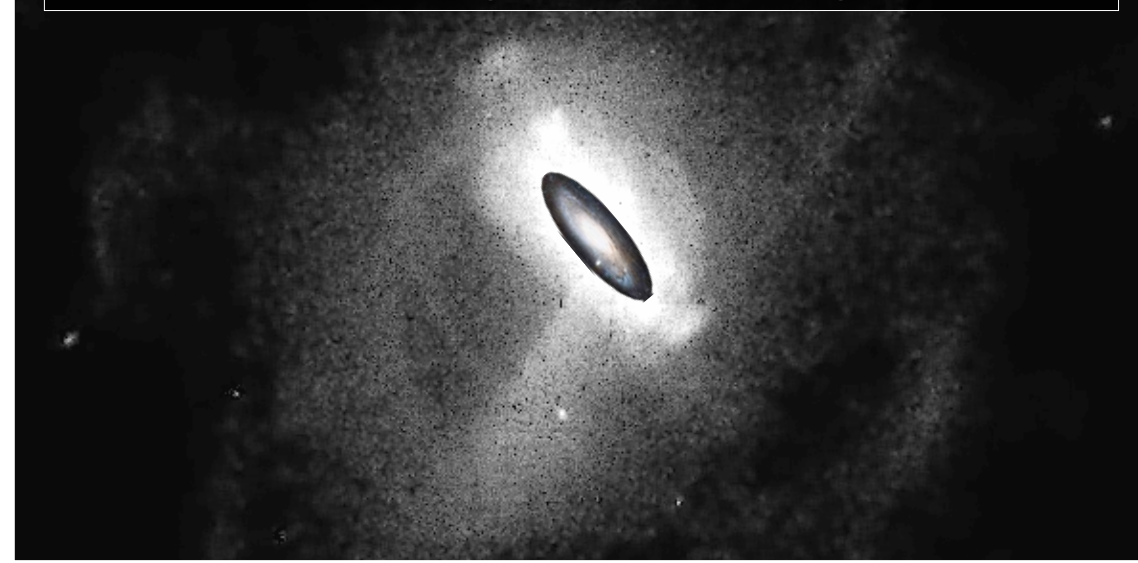
Stars By the Billions

Planets By the Thousands

Gravitational Wave Counterparts



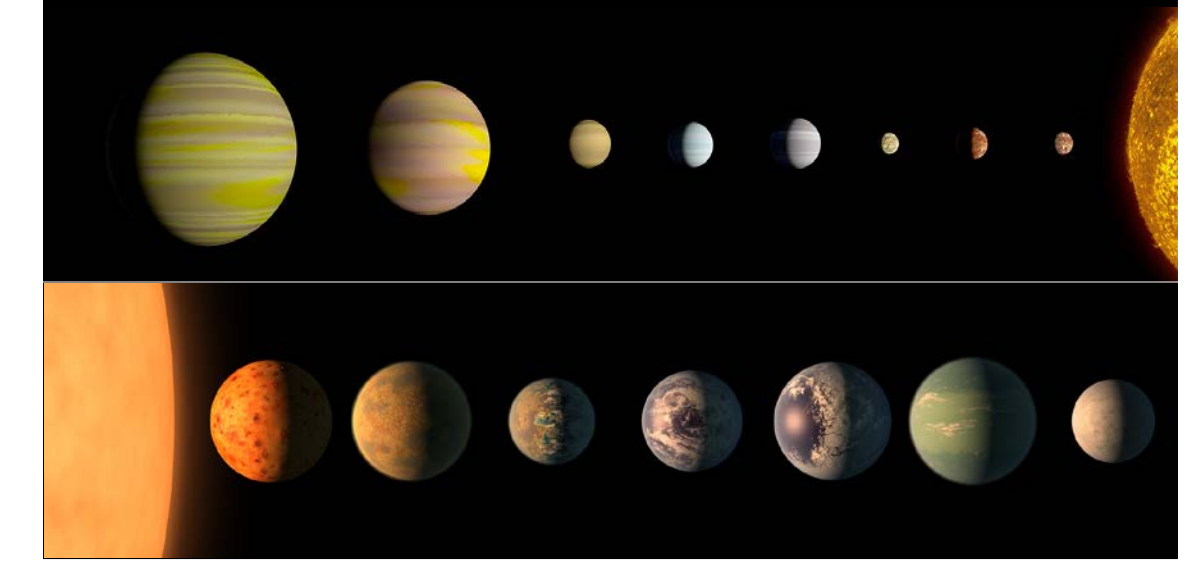
Galaxy Assembly



Stellar Populations



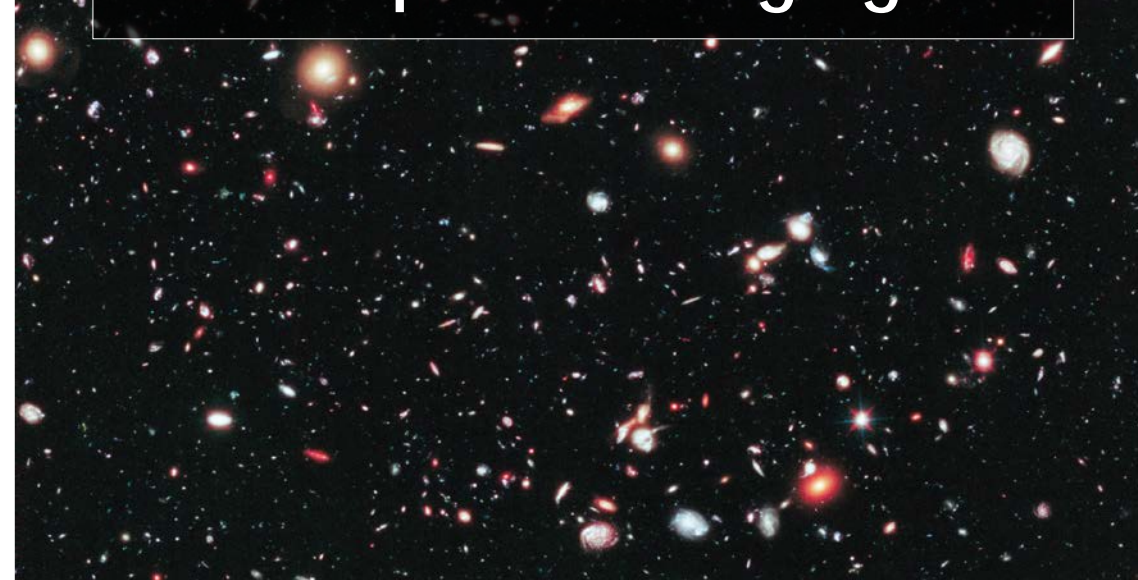
Planetary System Diversity



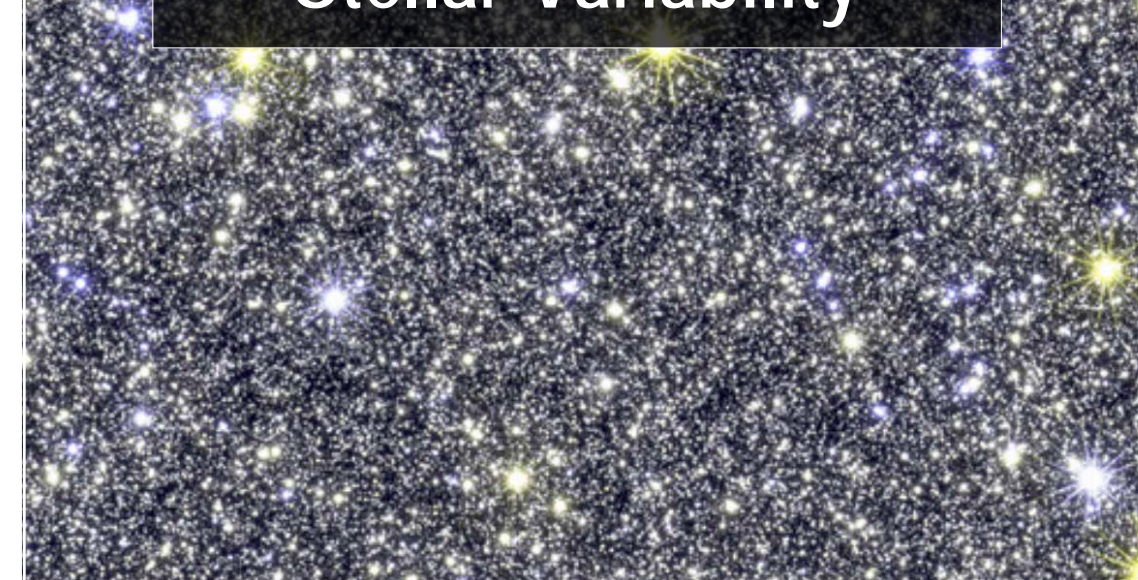
Expansion of the Universe



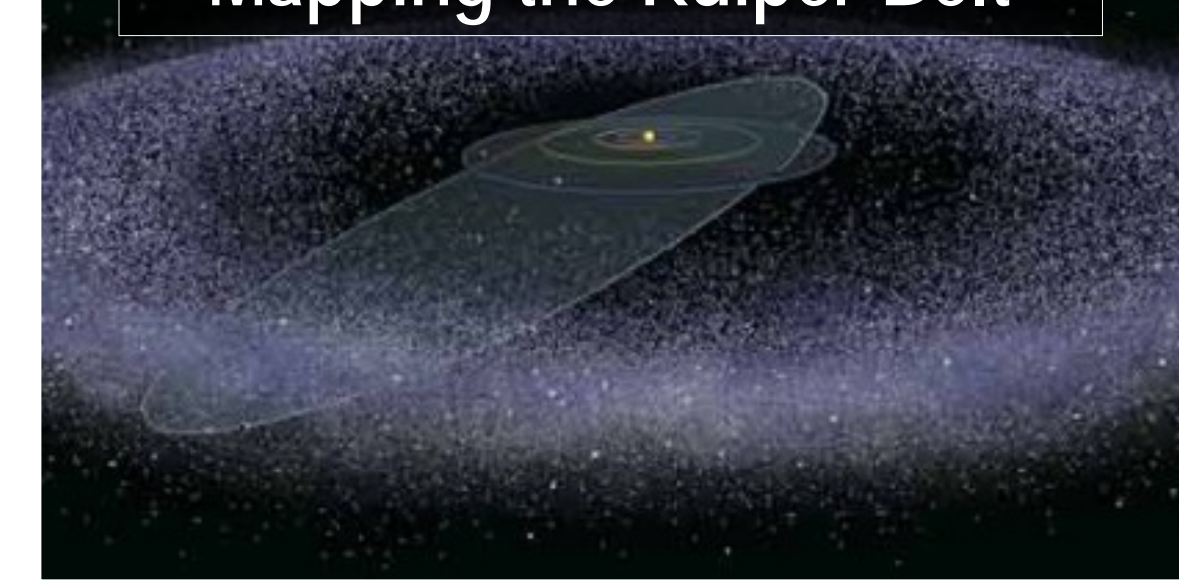
Deep Field Imaging



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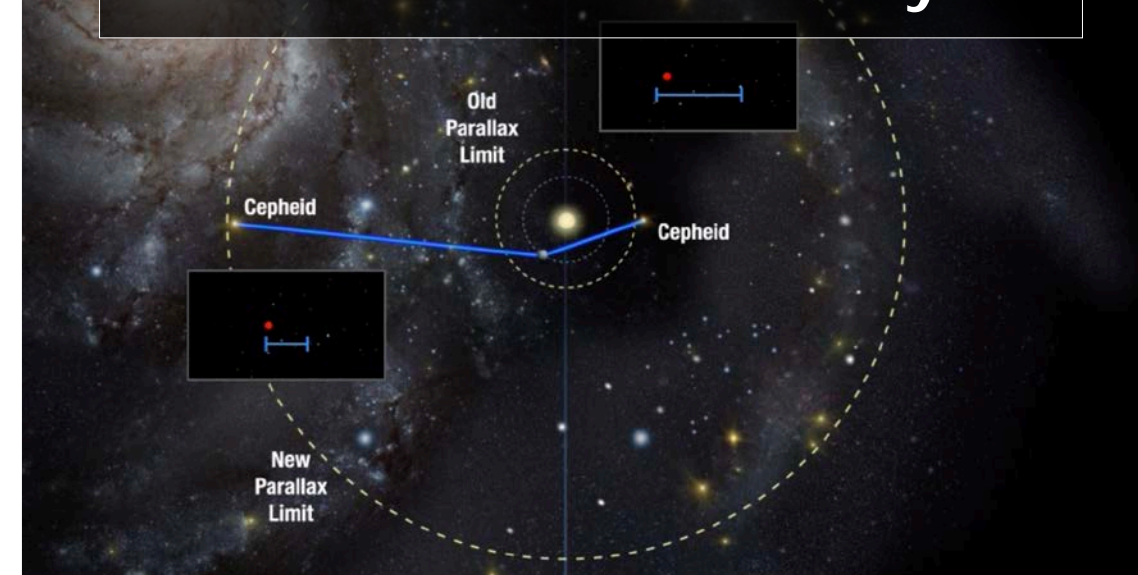
Dark Matter Mapping



Galaxy Evolution



Precision Astrometry



Circumstellar Disk Imaging





WFIRST Space Telescope Advisory Committee (WSTAC)

- Provide STScI Director with advice on strategies and priorities for the science program and science operations of WFIRST
- Specific topics to address include:
 - Establishing vision for WFIRST as a NASA Great Observatory
 - Community engagement in WFIRST science themes
 - Advocacy and messaging appropriate for an observatory of this scale
 - Readiness of the Science Operations Center (SOC) to support the broad user community
 - Effectiveness of working relationships, relative roles, and responsibilities of the SOC and WFIRST Science Investigation Teams (SITs), and maturity of interfaces
 - Data management, computation, and archival strategies for WFIRST
 - Data accessibility and community funding preparations
 - Observing time allocation strategies, levels of work effort, and resource allocation, including overall balance between survey programs and pointed program



WFIRST Space Telescope Advisory Committee (WSTAC)

Beth Willman (NSF's National Optical-Infrared Astronomy Research Laboratory) - Chair

Zach Berta-Thompson (U. Colorado)

Wendy Freedman (U. Chicago)

Josh Frieman (Fermilab)

Suvi Gezari (U. Maryland)

Lori Lubin (U. California-Davis)

John Mather (GSFC)

Kristen McQuinn (Rutgers, U. Texas)

Adam Riess (JHU/STScI)

Zeljko Ivezic (U. Washington, LSST)

+ 2 more TBD

Jeff Kruk (GSFC WFIRST Project Scientist, ex-officio)

David Spergel (Flat Iron Inst., WFIRST Wide-Field Instrument Adjutant Scientist, ex-officio)



Come See Us!

Stop by the STScI booth to talk to us about:

- HST, JWST, WFIRST
- The Mikulski Archive for Space Telescopes
- Future mission concepts
- NASA's Universe of Learning
- Turning your science result into a press release
- Our diversity, equity, and inclusion efforts
- Job opportunities