



STScI | SPACE TELESCOPE
SCIENCE INSTITUTE

EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

Community Science with Roman

Realizing the scientific potential of Roman Space Telescope Surveys

Karoline Gilbert

Nancy Grace Roman Space Telescope, Mission Scientist

STScI Town Hall, 237th AAS meeting

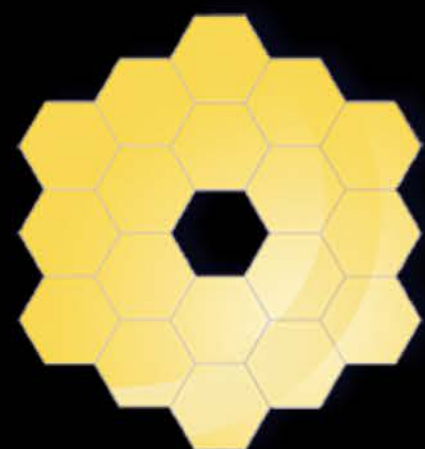
MIRRORS



HUBBLE

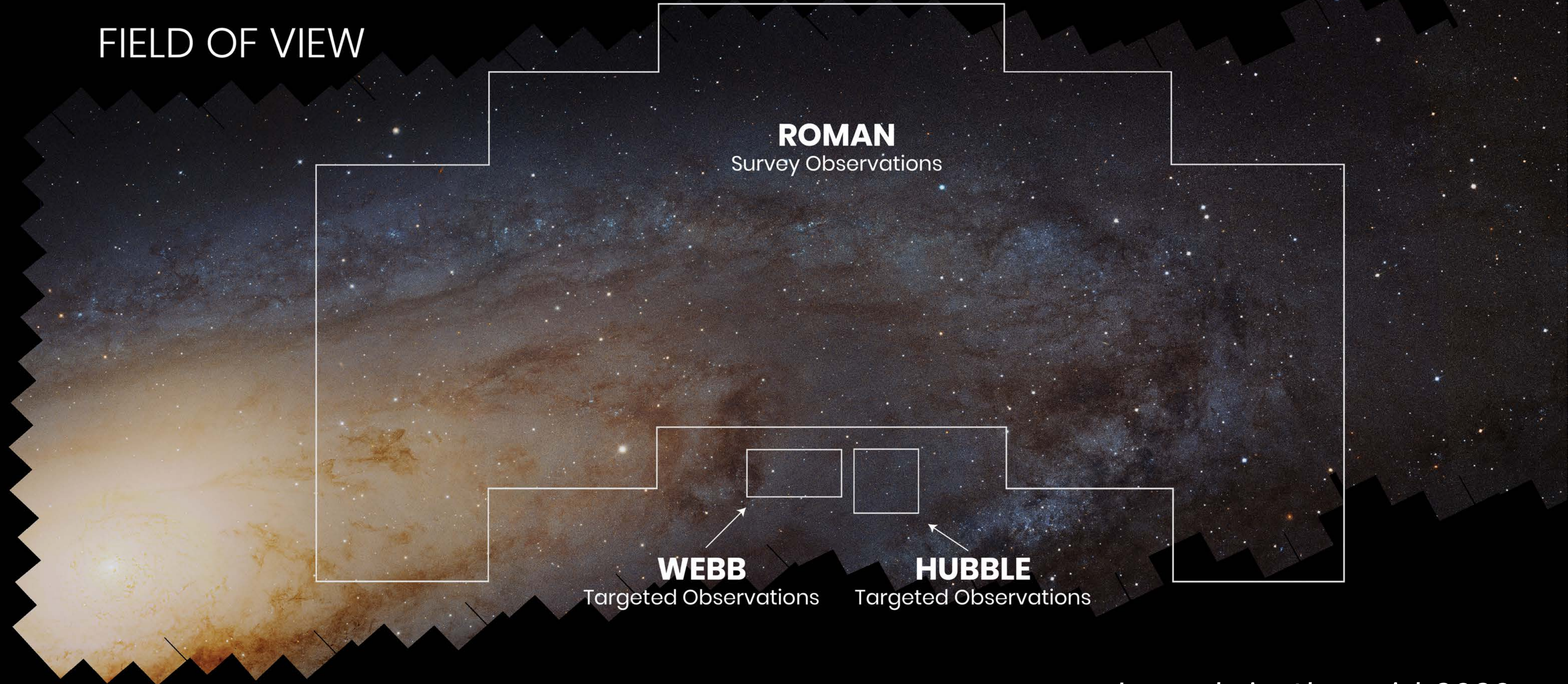


ROMAN



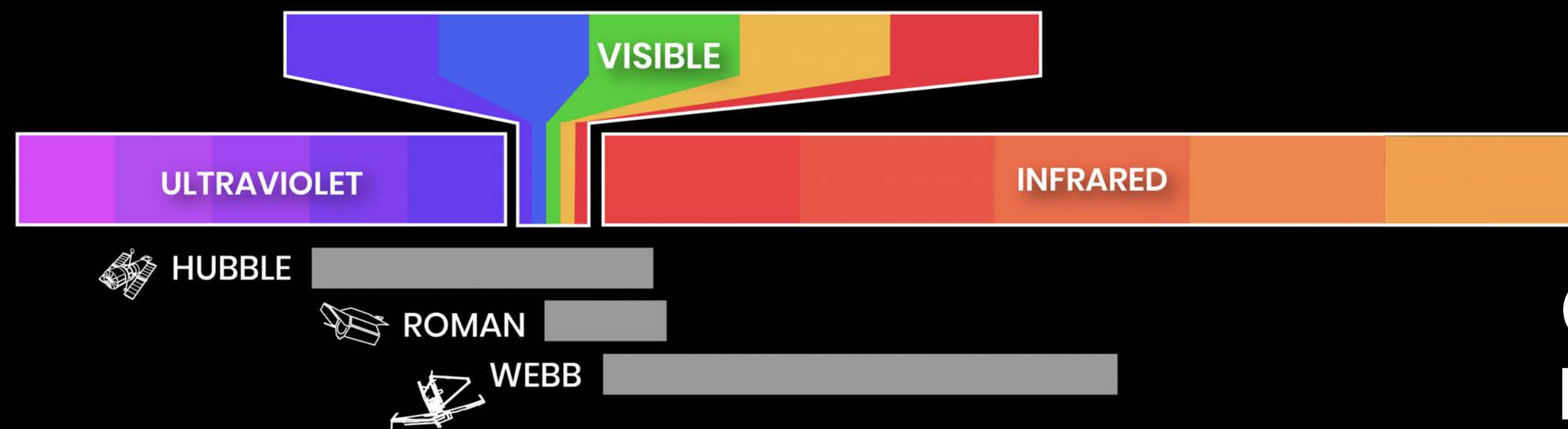
WEBB

FIELD OF VIEW



Launch in the mid 2020s

WAVELENGTH



Wide Field Instrument
*imaging from 0.5-2.3 μm
slitless spectroscopy from
0.75-1.93 μm*

Coronagraphic Technology
Demonstration Instrument

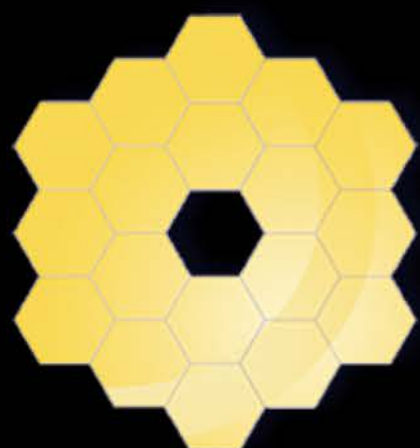
MIRRORS



HUBBLE

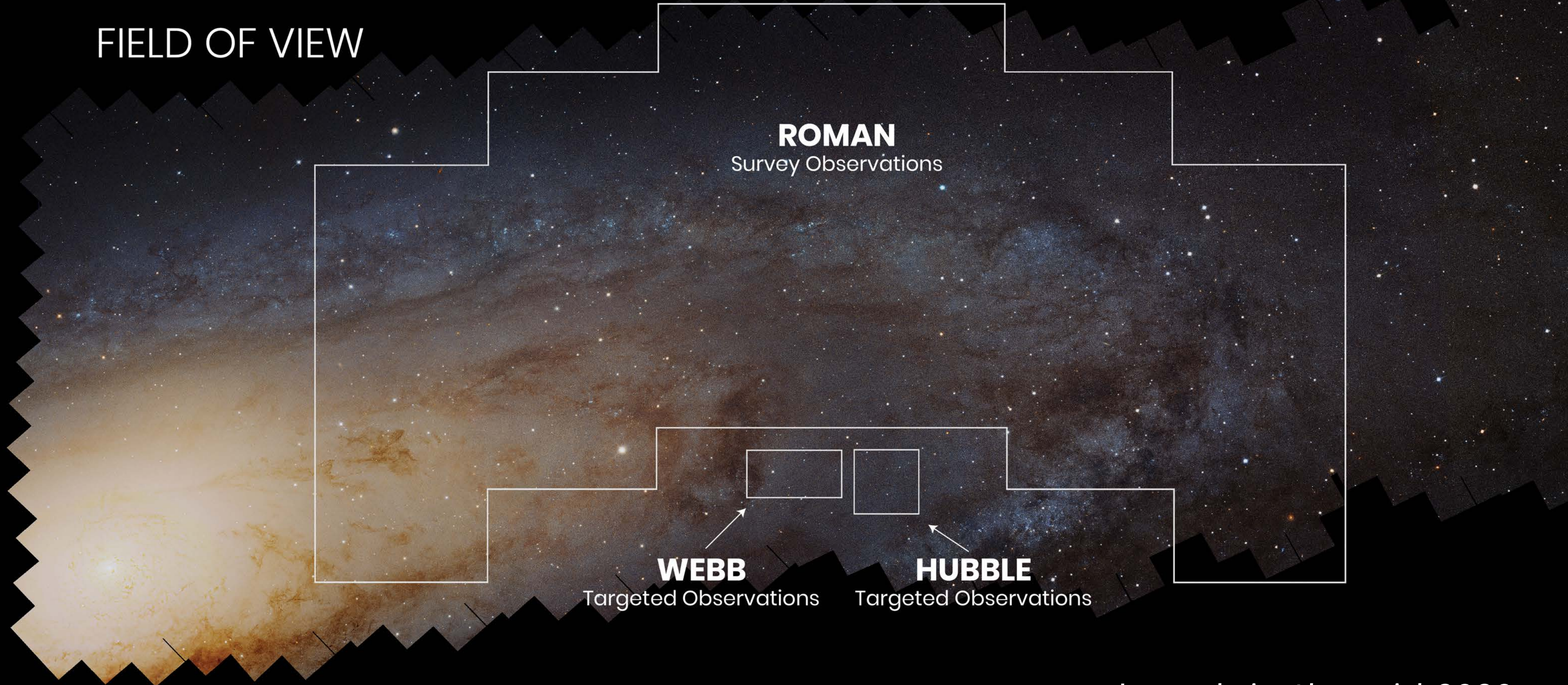


ROMAN

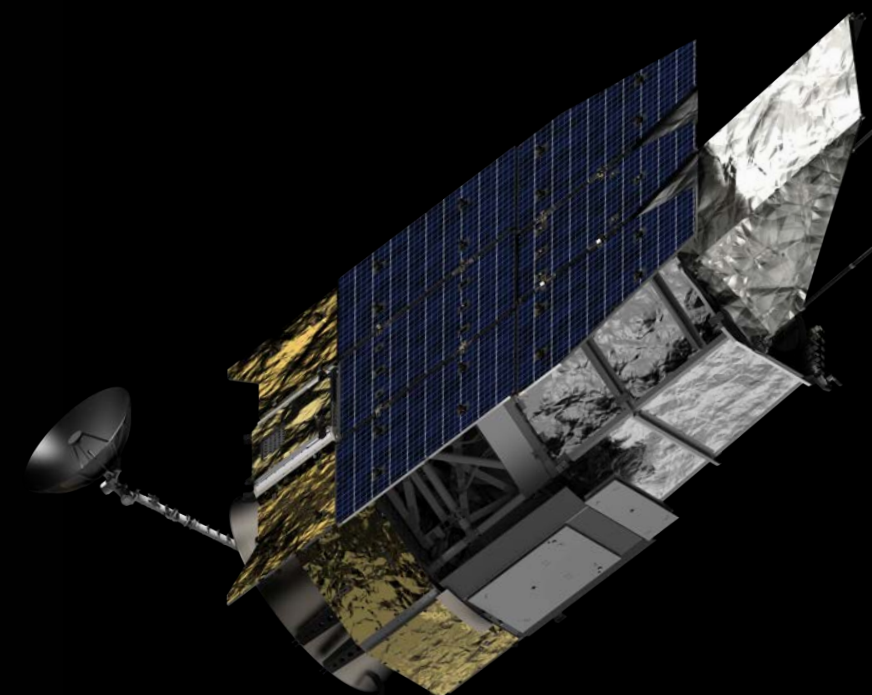


WEBB

FIELD OF VIEW



Launch in the mid 2020s



The Partners Distributed Operations Model

STScI is the Science Operations Center



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Plus Industry, International, and Academic Partners



Roman Space Telescope Mission Status



Major mission milestone passed in February 2020:
Out of “Formulation” and into “Implementation”

Mission Critical Design Review will occur in 2021

Hardware in development, flight detectors being built and delivered

Telescope Critical Design Review passed in December
15 detectors passing all flight requirements are in hand

Newly added WFI imaging filter extends wavelength range to 2.3 μm

All data will be publicly available with no proprietary period

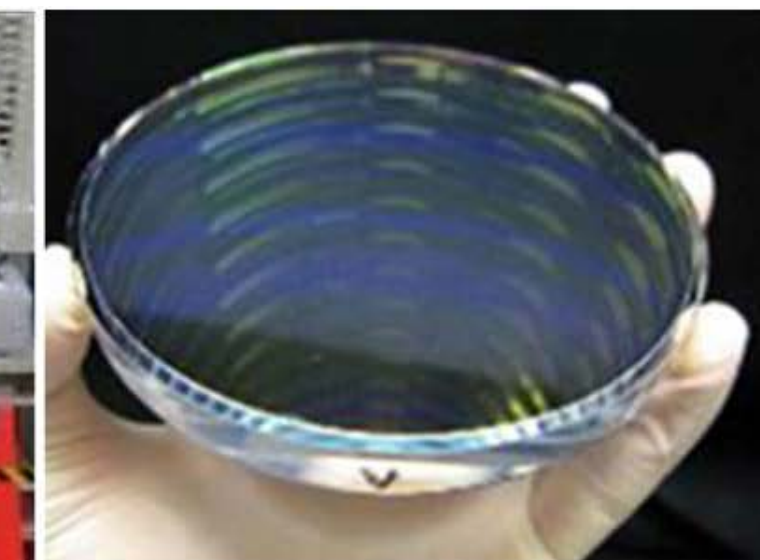
All Observing Time remains available

Look for Proposal opportunities for a range of preparatory science programs beginning in 2021

Primary Mirror

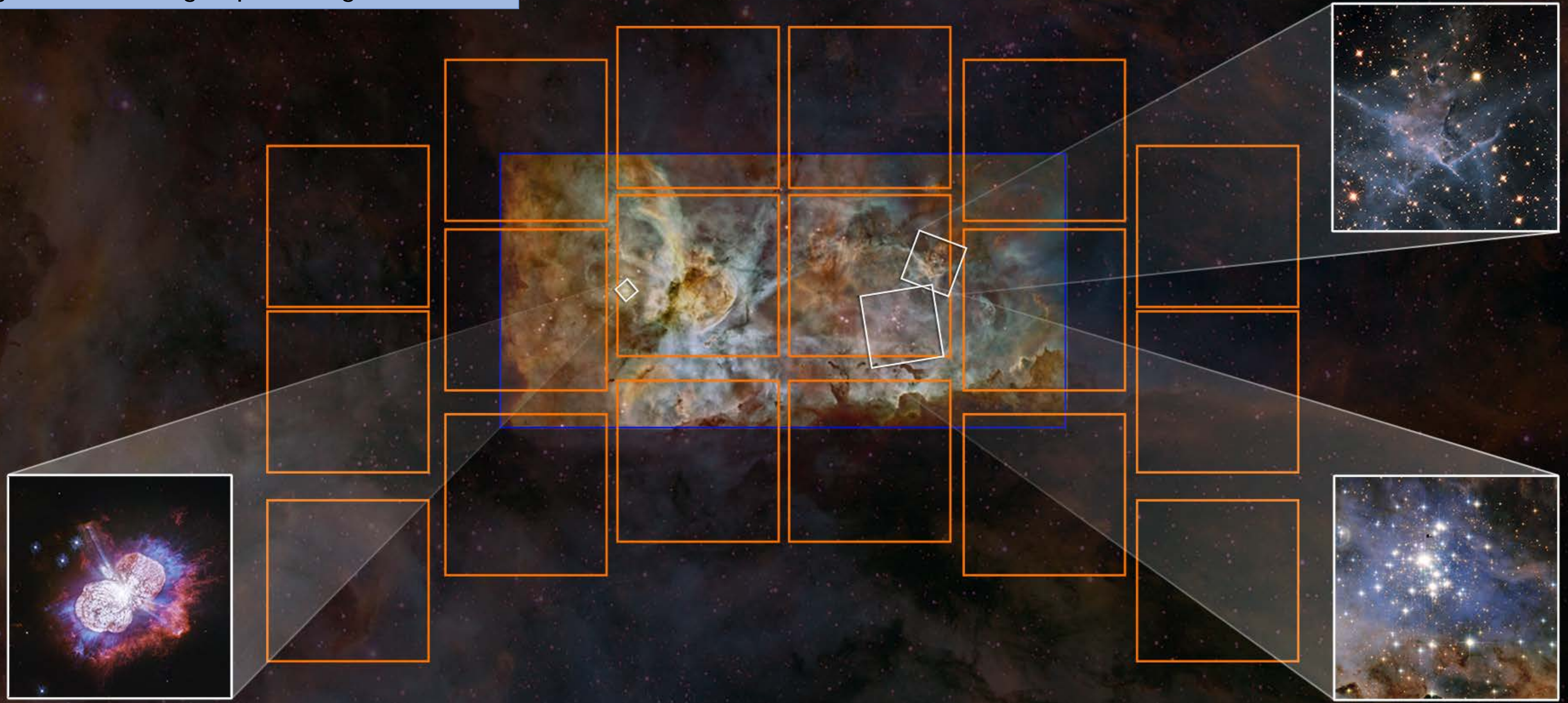


Engineering Test Unit WFI Filter

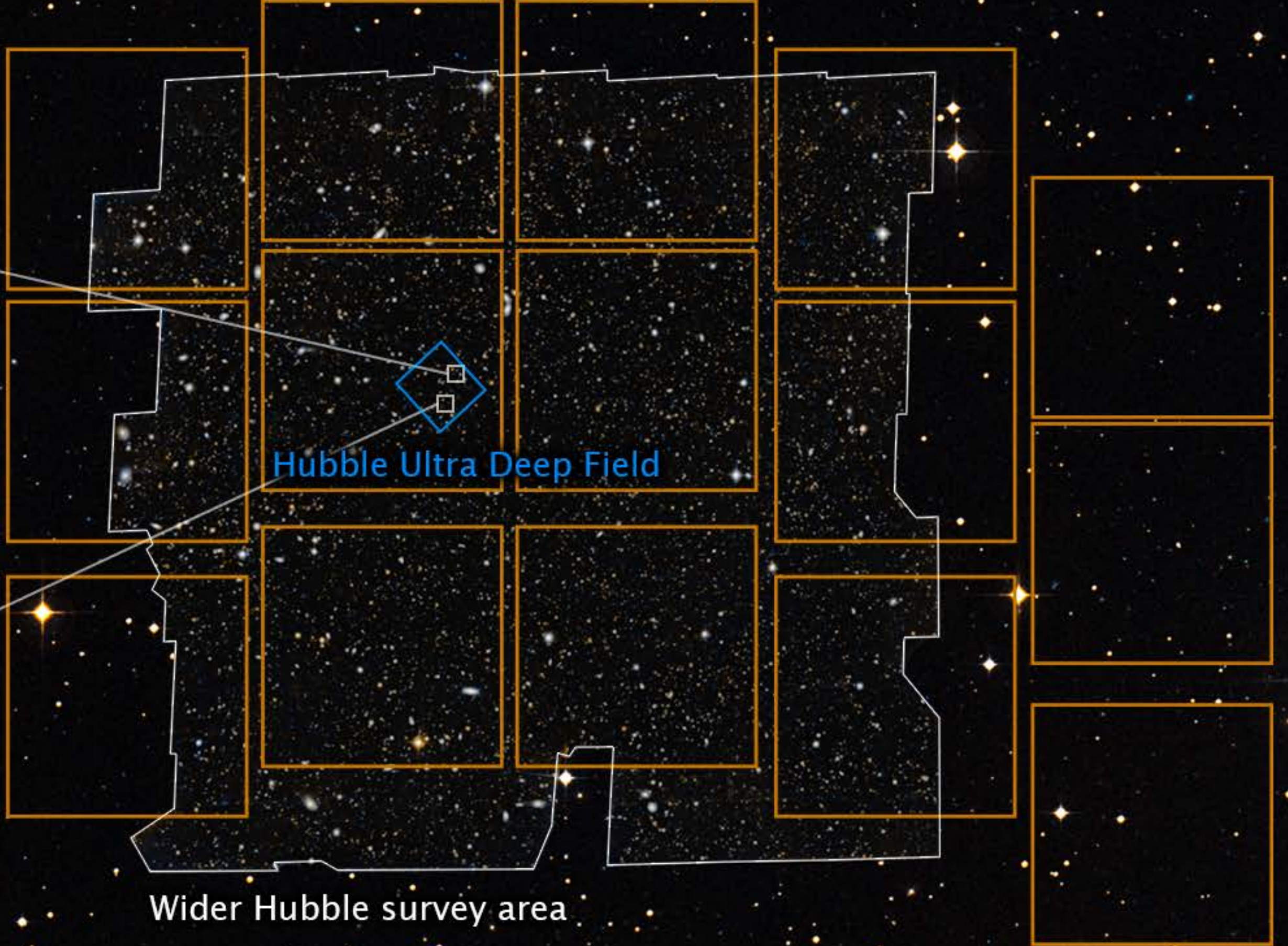
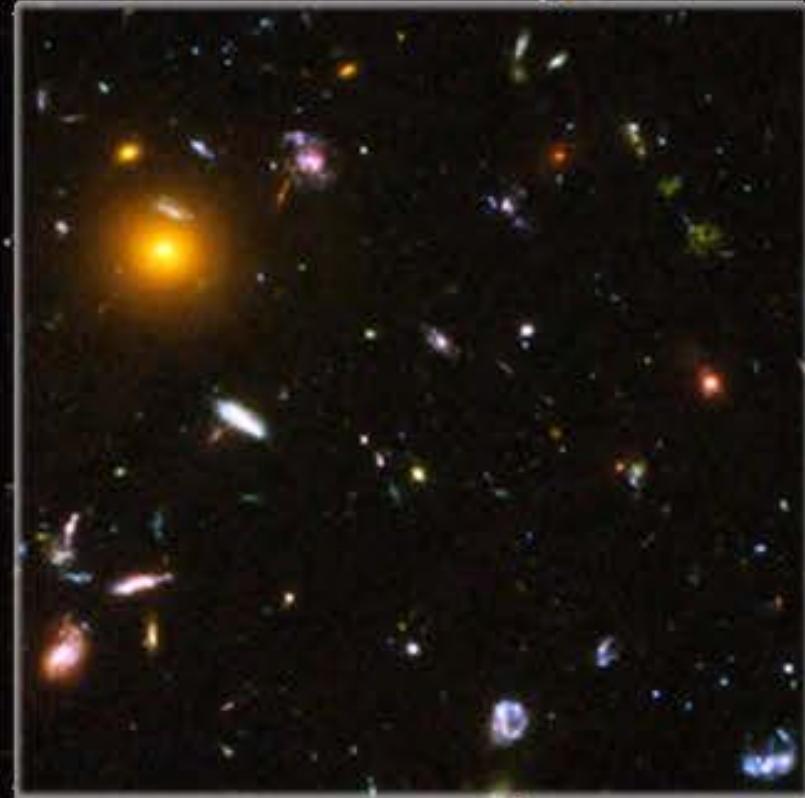


WFI Focal plane mosaic plate

Capture examples of the full stellar lifecycle in extended star forming regions in a single pointing



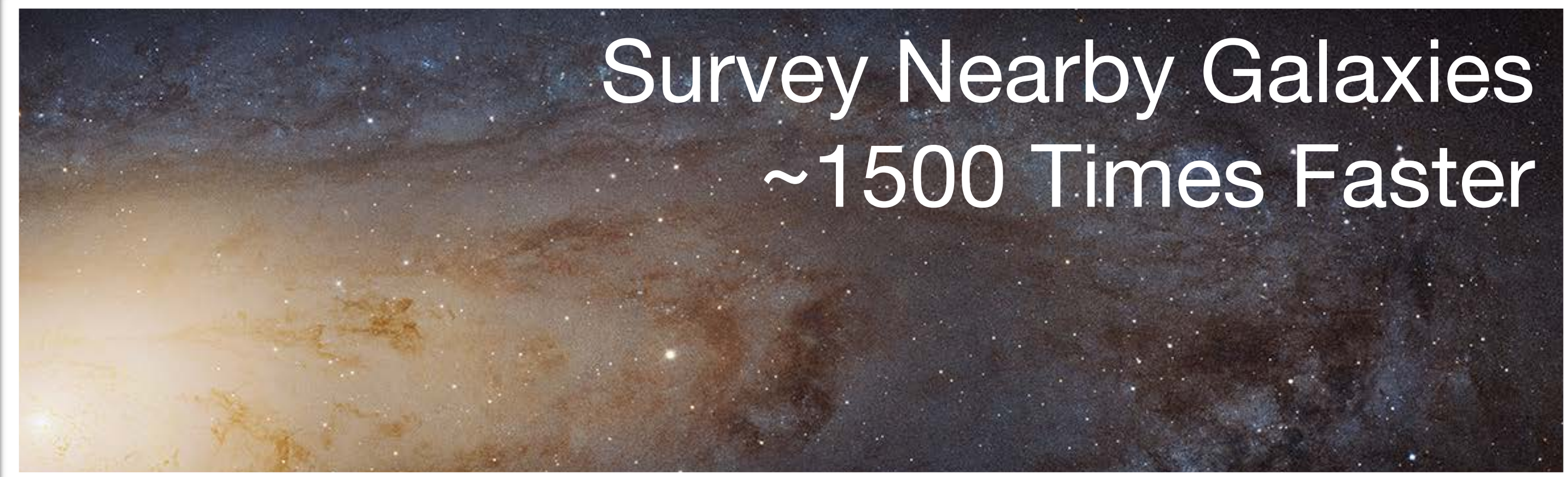
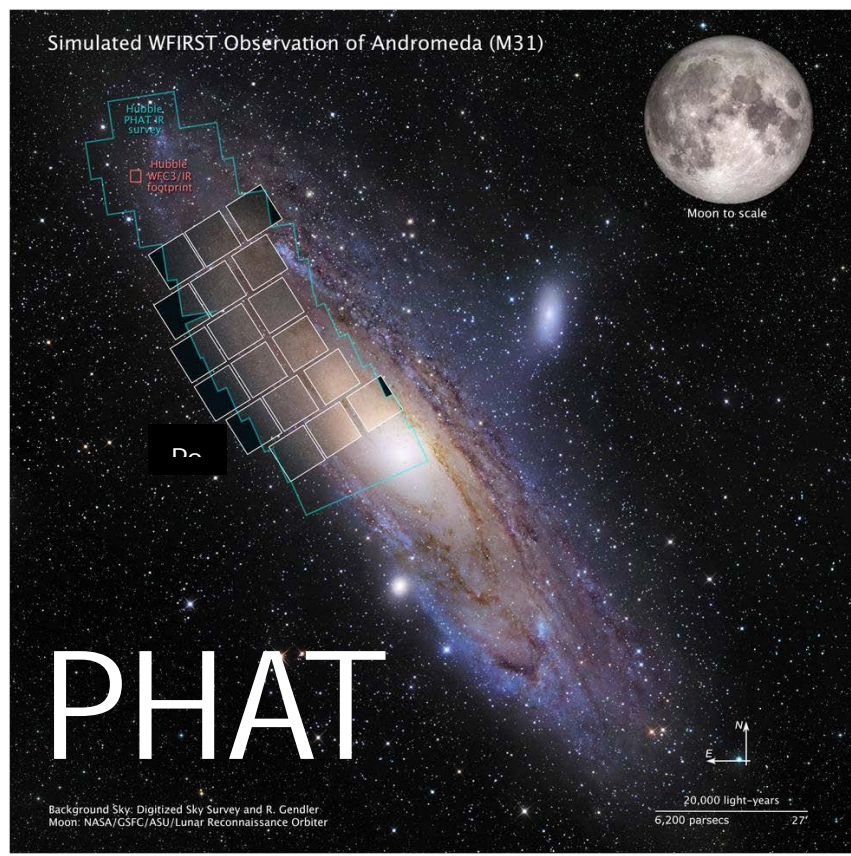
Observe large samples of galaxies at high redshift, at Hubble-equivalent resolution, in a single pointing



Roman field of view

Wider Hubble survey area

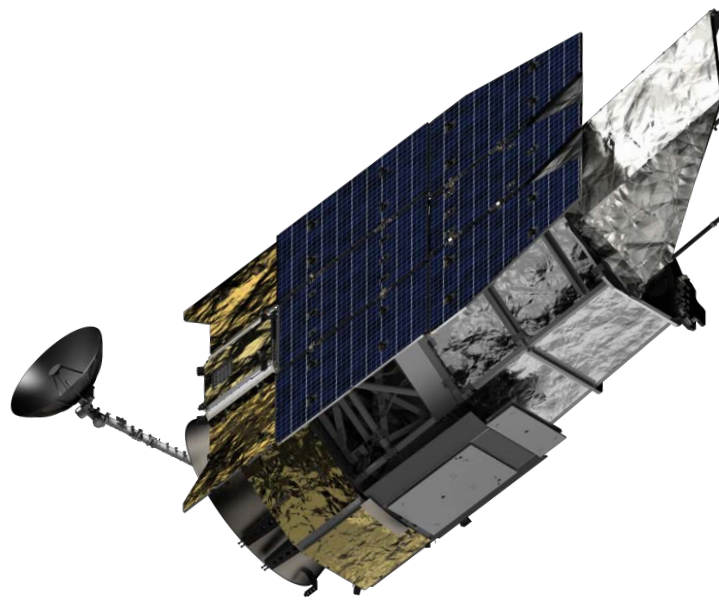
PI J. Dalcanton



PIs S. Faber,
H. Ferguson



PI P. van Dokkum

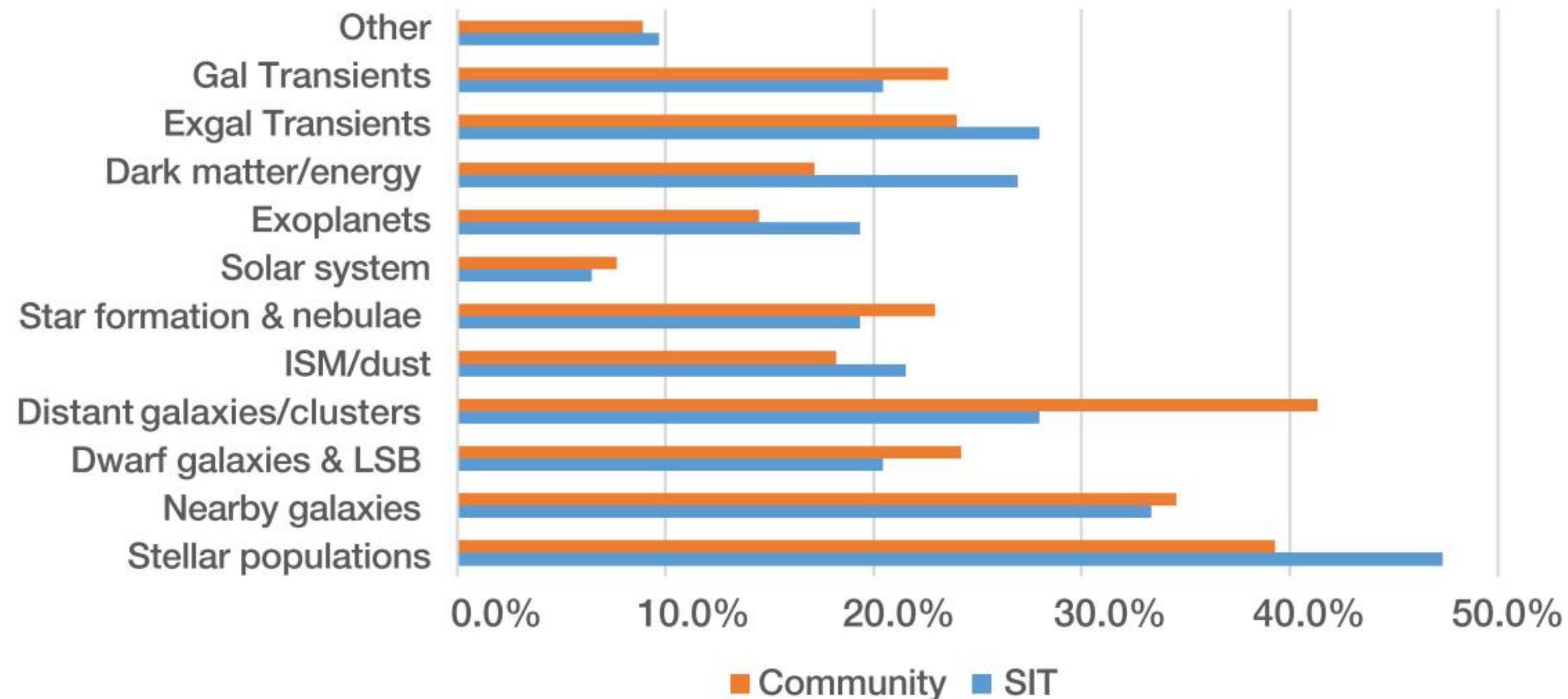




How will the Community use Roman?

STScI conducted a community survey in spring 2020

- Responses showed strong interest in a very broad range of astrophysical topics
- A great number of respondents indicated interest in topics which are not the core science driving the Roman community surveys, but which should be possible to investigate with Roman community surveys
- Broad similarity between science interests of Science Investigation Team and community respondents

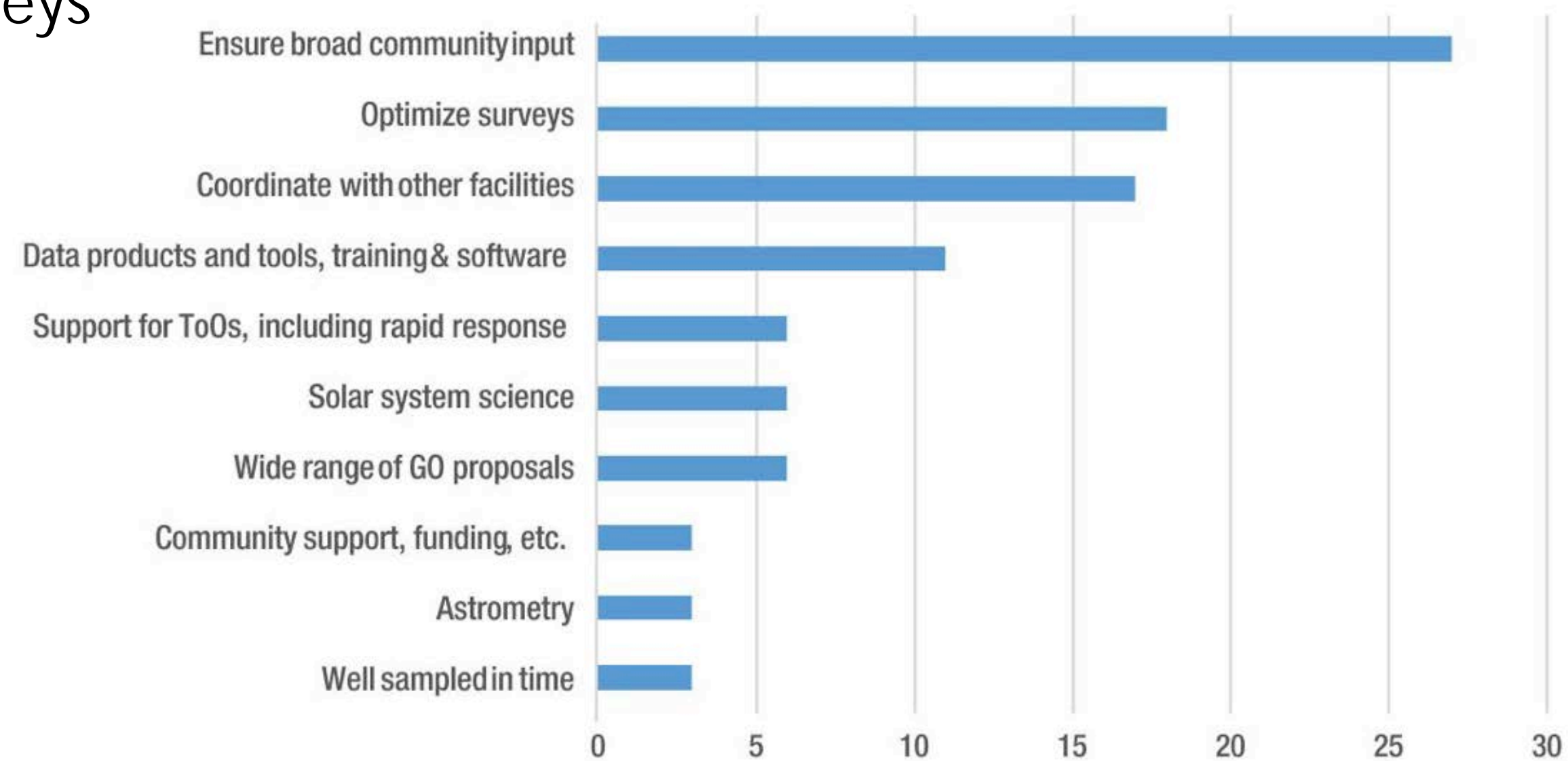




How will the Community use Roman?

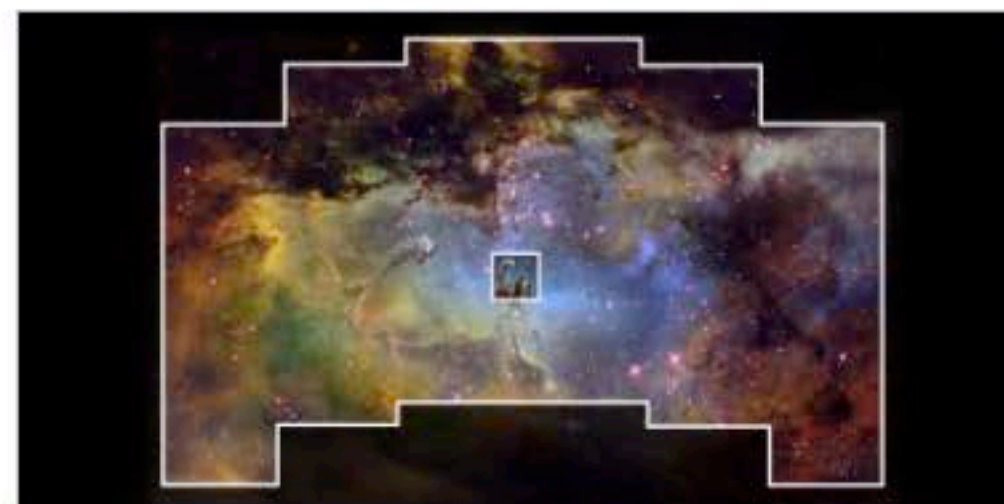
STScI conducted a community survey in spring 2020

- Respondents sent a clear message that they expect broad community input into defining the Roman community surveys



Freeform responses to query about important factors in specifying attributes of Roman observing program

For additional results and analysis, see the recent STScI Newsletter Article



2020 | VOLUME 37 | ISSUE 01

Community Science with the Nancy Grace Roman Space Telescope

A survey of the astronomical community reveals extensive interest in using observations with the Roman Space Telescope for investigations across a wide range of scientific themes. Roman's science program will reflect diverse interests, and will benefit from community participation in designing the observations, with open access to all data. As the Science Operations Center, the Institute has a key role in ensuring...

[View Article >](#)

<https://stsci.edu/roman/news-and-events/articles>



Join the Roman Conversation

Contact your Roman advisory committee members

- Roman Space Telescope Advisory Committee (RSTAC): advisory to the STScI Director on Roman science operations. Chair: Beth Willman (AURA/NOIRLab)
- Roman Science Interest Group (RSIG): advisory to NASA GSFC's Roman Project and NASA Headquarters on Roman Mission planning, development and operations. Chair: Megan Donahue (Michigan State University)

Both are charged with representing the interests of the broad astronomical community

Full membership and charters:

<https://stsci.edu/roman/about/roman-advisory-committee-rstac>

<https://roman.gsfc.nasa.gov/science/rsig.html>



Join the Roman Conversation

Look for proposal opportunities beginning in 2021 for a range of Roman preparatory science programs

The current terms of the Science Investigation Teams will end in 2021

Look for future requests for community input into the design of Roman's surveys

Current survey definitions were developed for informing the Design Reference Mission, and are not the operational survey designs

Participate in future Roman science conferences

Alternating yearly between STScI and IPAC

IPAC will host a meeting focused on transient and time domain science with Roman in fall of 2021

stsci.edu/events

**Astronomy in the 2020s:
Synergies with WFIRST**

June 26-28, 2017
Baltimore, Maryland, USA

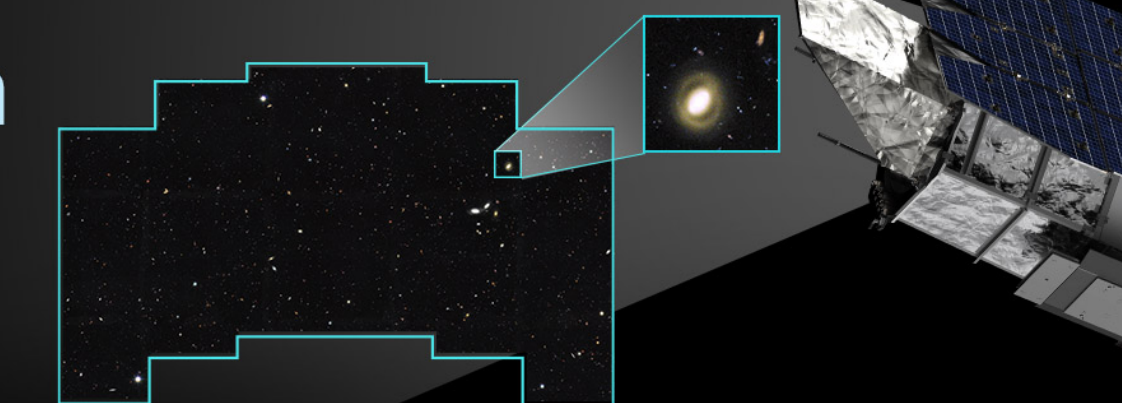
June 18 - 20, 2019
Caltech's Hameetman Auditorium

Science in Our Own Backyard:
Exploring the Galaxy and the Local Group with WFIRST

**Galaxy
Formation
and
Evolution
in the Era
of the**

October 5-9, 2020

NANCY GRACE ROMAN SPACE TELESCOPE





Learn More About Roman

Upcoming AAS Roman Events

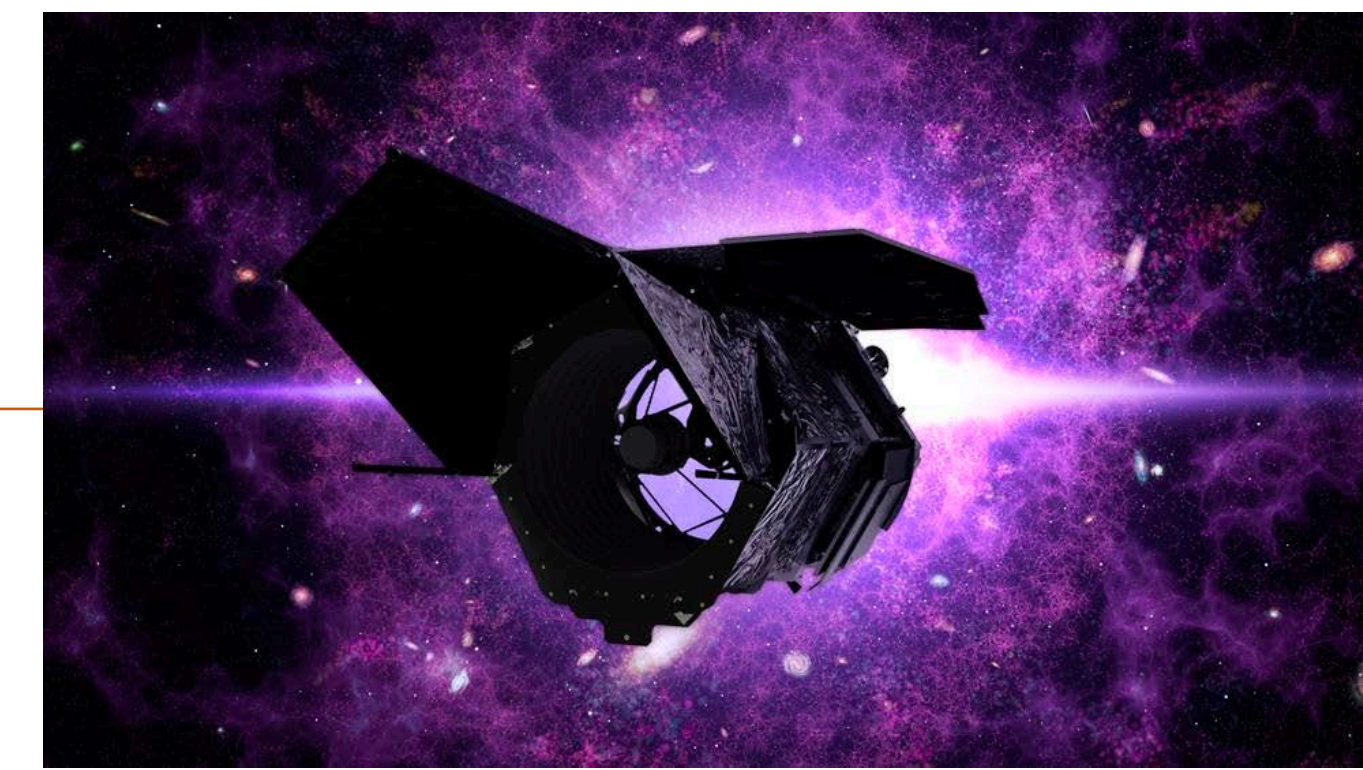
Wednesday Jan 13, 4:10-4:50 pm ET, iPoster Session 327
The Nancy Grace Roman Telescope

Wednesday Jan 13, 5:00-5:30 pm ET, Webinar
NASA Science: Wide Field Survey Science with the Nancy Grace Roman Space Telescope (presenter: Dominic Benford)

Thursday Jan 14, 4:10-5:40 pm ET, Splinter Session
Exploring the Milky Way with the Nancy Grace Roman Space Telescope

Thursday Jan 14, 12:00-1:30 pm ET, Oral Session 416
Roman and LUVVOIR

Friday Jan 15, 1:40-2:40 pm ET, Nancy Grace Roman Town Hall



Visit Roman Partner Sites

stsci.edu/roman

nasa.gov/roman

roman.gsfc.nasa.gov

roman.ipac.caltech.edu

Visit STScI AAS Booth

Chat with STScI Staff

Obtain Roman resources



Additional Material

Roman Space Telescope Imaging Capabilities

Telescope Aperture (2.4 meter)	Field of View (45'x23'; 0.28 sq deg)			Pixel Scale (0.11 arcsec)			Wavelength Range (0.5-2.3 μm)	
Filters	F062	F087	F106	F129	F158	F184	F213	W146
Wavelength (μm)	0.48-0.76	0.76-0.98	0.93-1.19	1.13-1.45	1.38-1.77	1.68-2.00	1.95-2.30	0.93-2.00
Sensitivity (5 σ AB mag in 1 hr)	28.5	28.2	28.1	28.0	28.0	27.5	26.2	28.3

Roman Space Telescope Spectroscopic Capabilities

	Field of View (sq deg)	Wavelength (μm)	Resolution	Sensitivity (AB mag) (10 σ per pixel in 1hr)
Grism	0.28 sq deg	1.00-1.93	461	20.5 at 1.5 μm
Prism	0.28 sq deg	0.75-1.80	80-180	23.5 at 1.5 μm

Roman Space Telescope Coronagraphic Capabilities

	Wavelength (μm)	Inner Working Angle (arcsec)	Outer Working Angle (arcsec)	Detection Limit*	Spectral Resolution
Imaging	0.5-0.8	0.15 (exoplanets) 0.48 (disks)	0.66 (exoplanets) 1.46 (disks)	10 ⁻⁹ contrast (after post-processing)	47-75
Spectroscopy	0.675-0.785				

https://roman.gsfc.nasa.gov/science/WFIRST_Reference_Information.html