

# James Webb Space Telescope

## Science Preparation Schedule



Jonathan P. Gardner  
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<http://jwst.nasa.gov>

Space Science Reviews, 2006, 123/4, 485

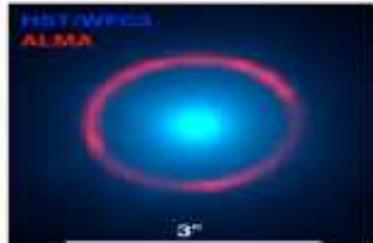
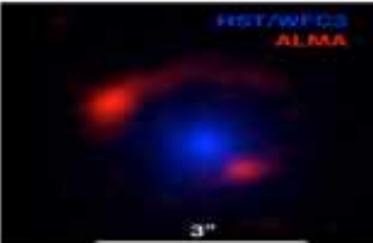
# JWST Science Program

- JWST provides unique capabilities for a wide range of scientific programs.
- Majority of time will be allocated through General Observer program with annual Calls for Proposals.
- About 4000 hours (total) allocated to Guaranteed Time Observer program.
- 10% of time allocated to Director's Discretionary program.
  - This includes 460 hours already allocated in Cycle 1 to the Early Release Science program.
- Cycle 1 GO call for proposals will be released in late 2019 or early 2020 with due date between March & May 2020.

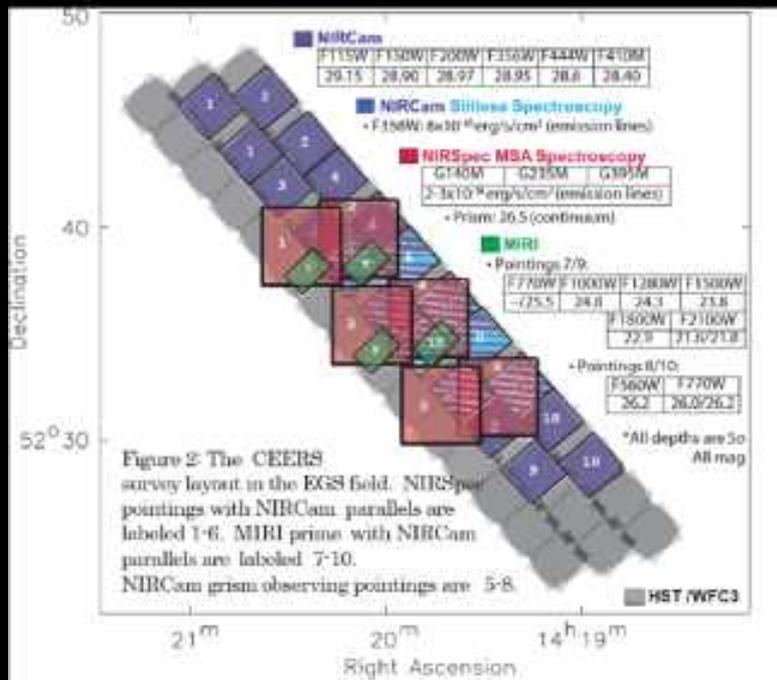
# Early Release Science Program

- ERS purpose:
  - Public JWST data early in Cycle 1 – first 3 months
  - Demonstrate science and capabilities
  - Teams return higher-level data products to the archive
- 106 proposals submitted: 13 selected for 460 Hours
- The selected programs represent participation by 253 investigators from 18 countries, 22 U.S. states, and 106 unique institutions.

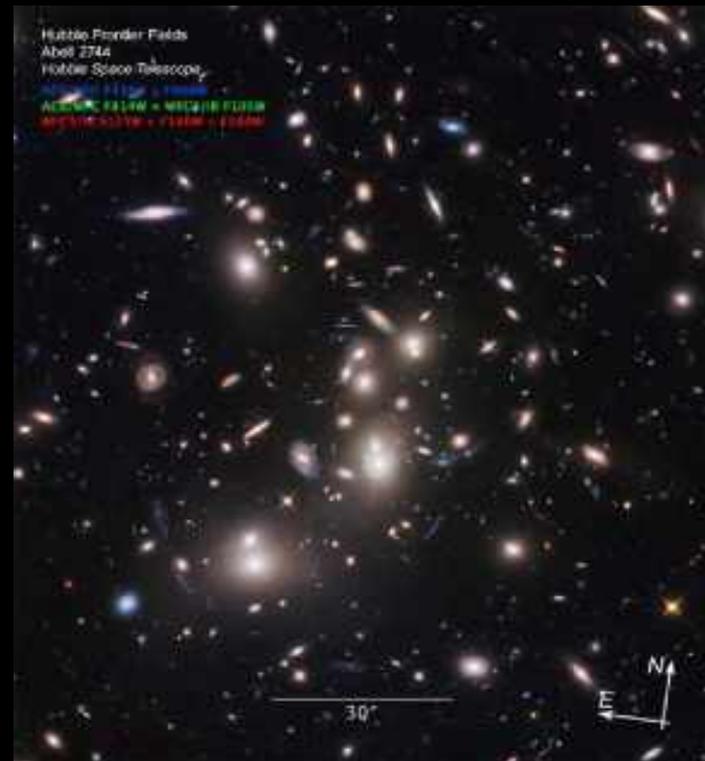
# ERS programs: Distant Galaxies and Cosmic Dawn

Source	S1723+34	S1226+21	SPT0418-47	SPT2147-50
redshift	1.32	2.92	4.22	3.76
magnification	20	40	32	6.6
Image Plane				

TEMPLATES: Highly lensed galaxies. PI: Jane Rigby



CEERS: Imaging and Spectroscopy of a CANDELS field. PI: Steve Finkelstein



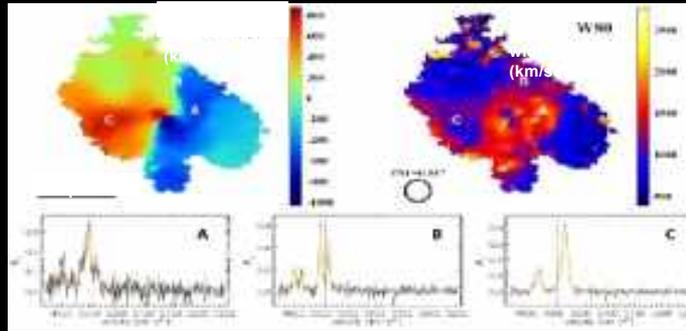
GLASS: Slitless and MOS Spectra of a Frontier Field Cluster. PI: Tomasso Treu

# ERS programs: Nearby and Resolved Galaxies

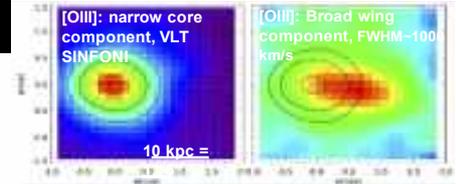
Nuclear Dynamics of a Seyfert.  
PI: Misty Bentz



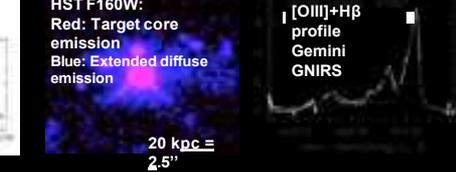
F2M1106 ( $z = 0.44$ )



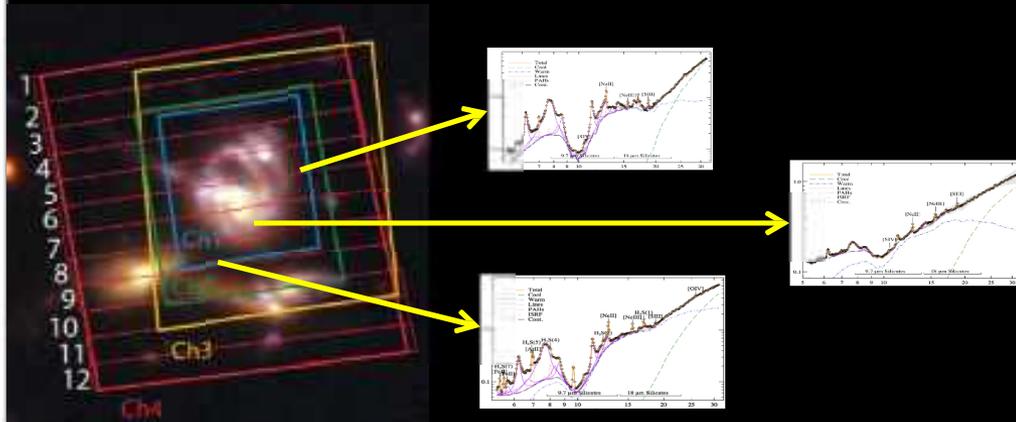
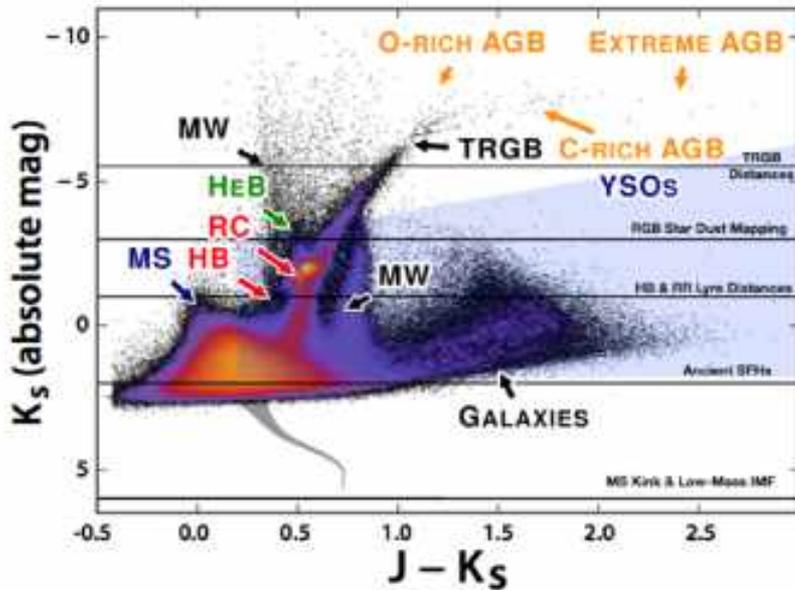
XID2028 ( $z = 1.59$ )



SDSSJ1652 ( $z = 2.94$ )



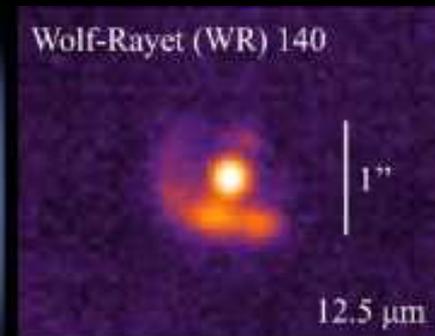
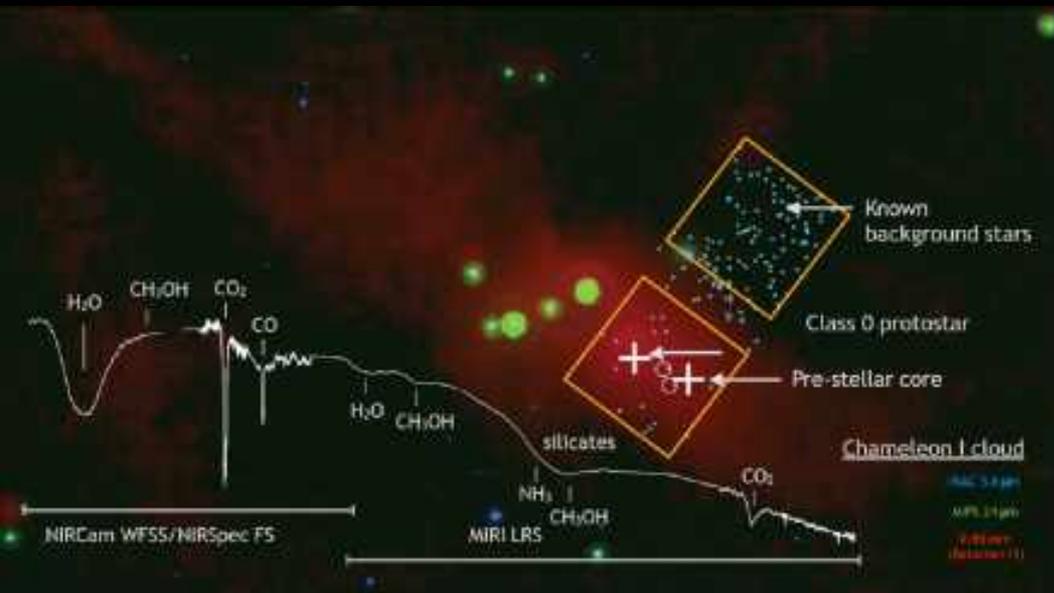
Q-3D: IFU of Quasar Hosts.  
PI: Dominika Wylezalek



Resolved stellar populations in globular and 2 dwarf galaxies.  
PI: Dan Weisz

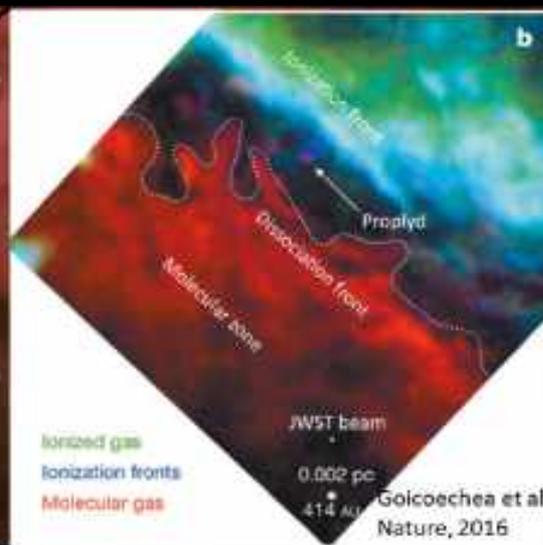
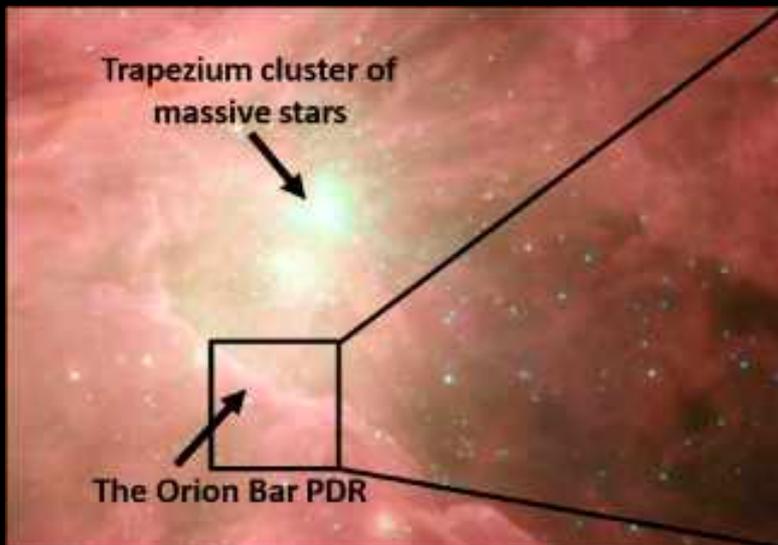
The Starburst-AGN connection in LIRGs.  
PI: Lee Armus

# ERS programs: Astrochemistry and the ISM



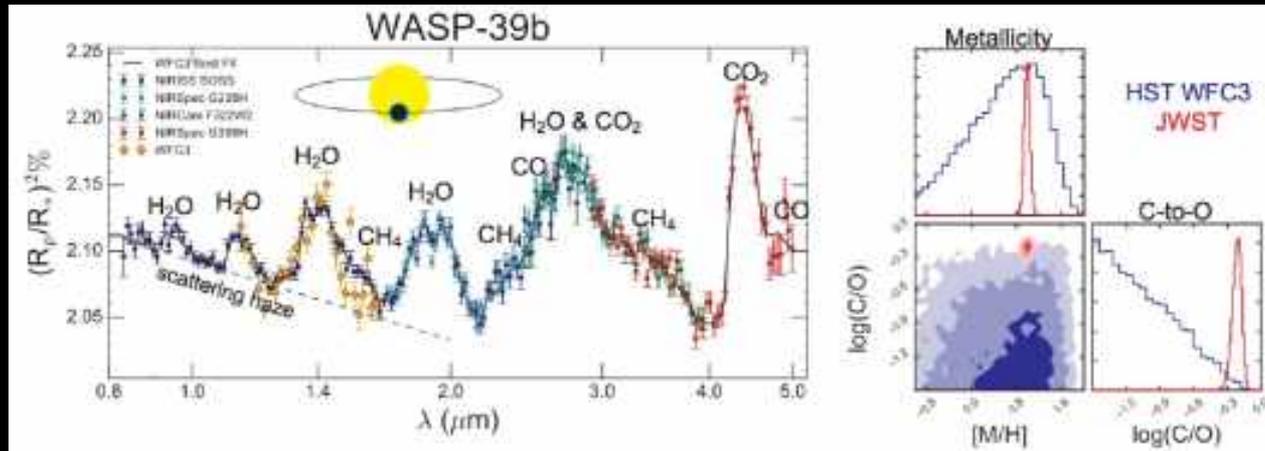
WR DustERS: Dust formation in colliding-wind Wolf-Rayet stars.  
PI: Ryan Lau

ICEAGE: Chemistry of ices in star formation.  
PI: Melissa McClure

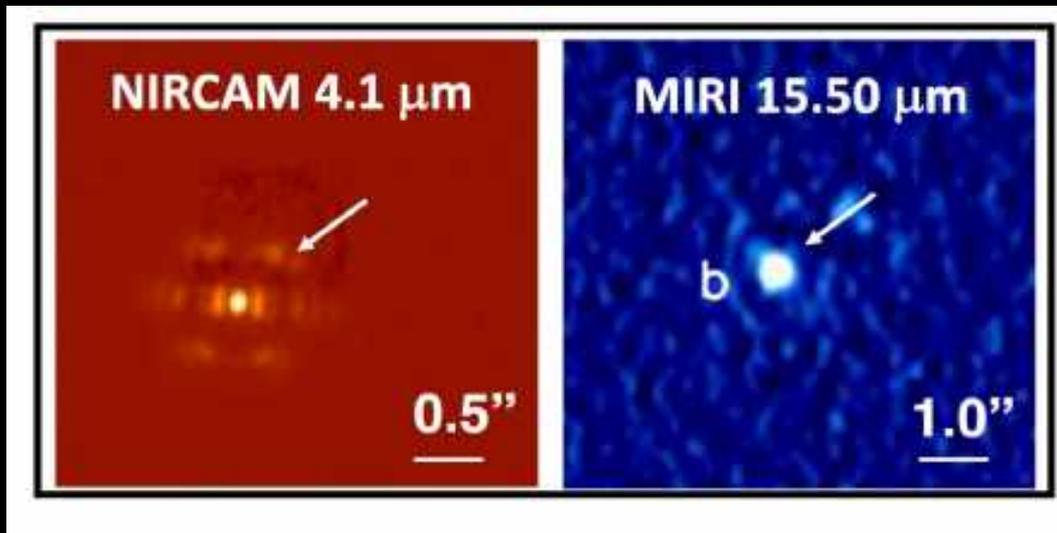


Radiative Feedback from Massive Stars: PDRs in Orion.  
PI: Olivier Berné

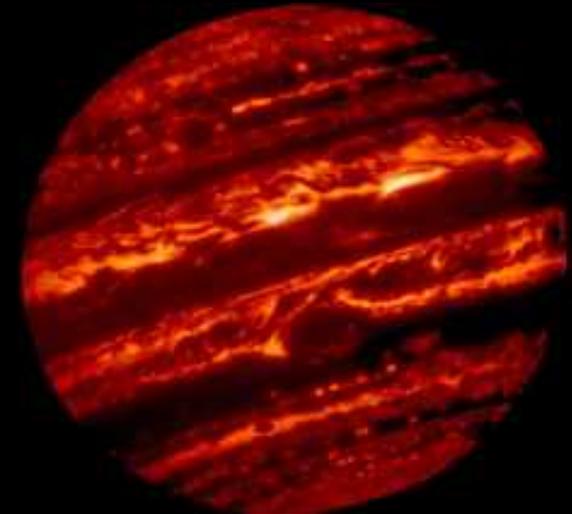
# ERS programs: Planets



Transiting Exoplanets. PI: Natalie Batalha



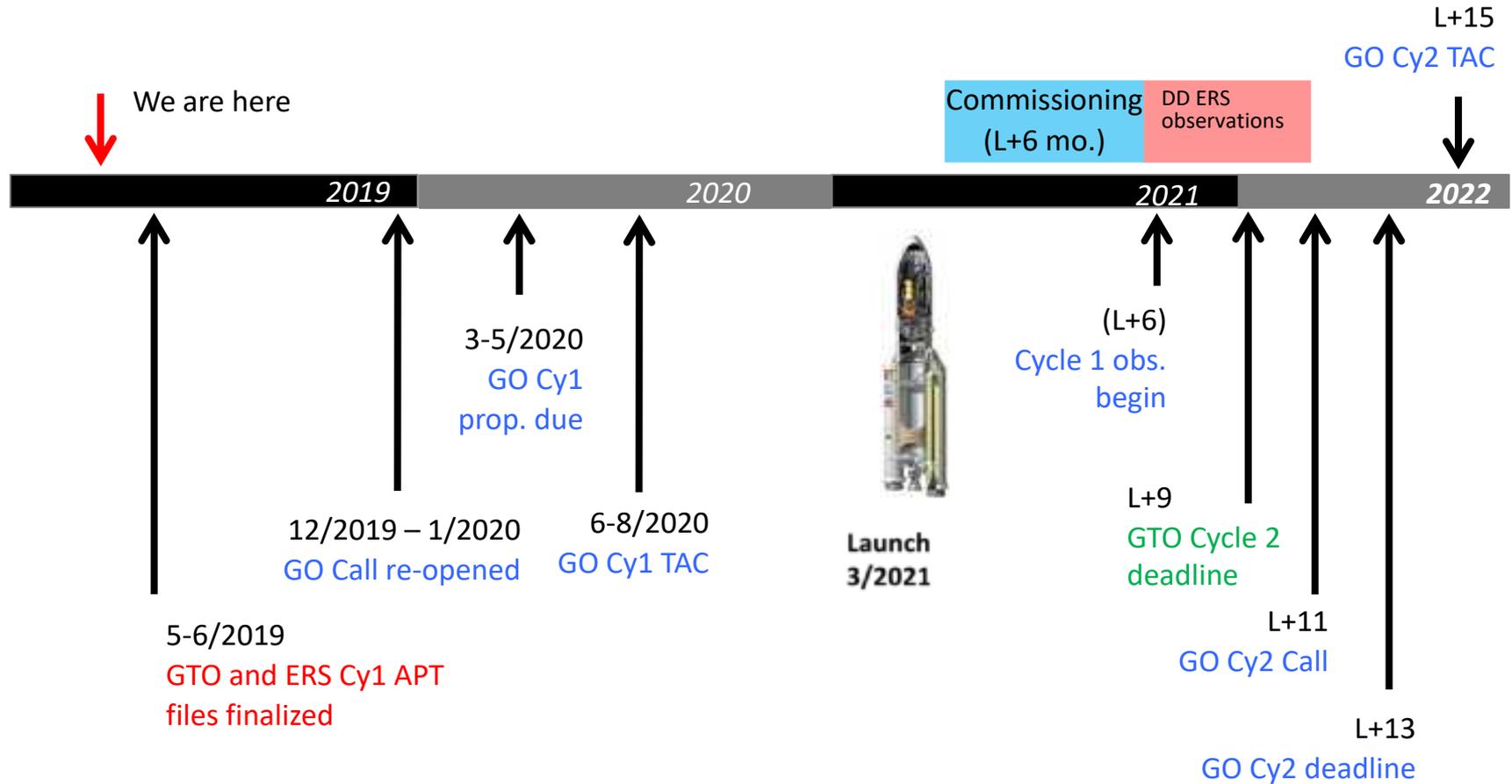
Exoplanet Coronagraphy. PI: Sasha Hinkley



The Jovian System. PI: Imke de Pater

# JWST Science Planning Timeline

Cycles 1 & 2 Call for Proposals



## Cycle 1 proposal timeline and GTO proposal revisions

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- STScI will set the Cycle 1 proposal schedule
  - GO Call will be re-issued in late 2019/early 2020
  - Final schedule will be set in consultation with JSTUC
- GTO proposers will have an opportunity to revise and update their proposals
  - Revisions must be approved as consistent with the current program goals by the Program Scientist for the JWST Program and by the STScI Director
  - Proposals must be finalised 7 months prior to the GO Call being re-issued (NASA Policy 8)
  - ERS proposals will be revised by the same deadline
  - Standard duplication rules apply regarding Cycle 1 GO programs
    - GO Proposers can check for potential duplications using the MAST tool – no spreadsheets
    - Scientifically unjustified duplicate observations will not be permitted
  - GTO time accounting will be determined using the Astronomer's Proposal Tool released for Cycle 1 GO proposals (APT 28.x.x)

## GO time available in Cycle 1

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- Observations are scheduled as wall-clock time
  - Observatory overheads are included in each allocation
  - 8766 hours available in an annual cycle
  - Over-subscribe by ~2,000 hours in Cycle 1 for scheduling efficiency
- Up to 10% of total time as DD time
  - 876 hours → ~7900 hours for GO+GTO
- GTO teams have scheduled ~3700 hours in their Cycle 1 programs
  - Only ~300 hours of GTO time left to schedule in Cycle 2 & 3
- **GO call will offer about 6000 hours in Cycle 1**
- Hubble has ~3500 science orbits/year
  - ~5200 hours (with overheads)
- JWST Cycle 1 will offer more GO time than a typical Hubble Cycle
- GO allocation increases in Cycle 2 & 3 as GTO time decreases

# JWST GO Program Types

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- We anticipate a balanced distribution in program sizes over all cycles
  - Small/Medium/Large in early cycles
  - The majority of time in Cycle 1 will likely be allocated to Small programs
    - There will be no cap on program size
- Cycle 1 will include specialized categories
  - Long-term programs → Regular/Medium programs whose science requires observations in future cycles (astrometry, variability)
  - ToO programs (e.g. high redshift supernovae)
  - Time-constrained observing programs (e.g. exoplanet transits)
  - Parallel observation programs
  - Treasury/Legacy programs → programs with broad science reach and emphasis on providing higher-level data products for the community
  - Joint JWST-HST programs *will* be available but only via the JWST Cycle 1 Call (not HST call)
  - Joint programs with other facilities (eg Chandra, ALMA/NRAO, ground-based OIR facilities) will *not* be available in Cycle 1
- JWST will also support proposals for archival & theory research programs
  - ERS programs available for AR proposals in Cycle 1
  - Some scope for related lab experiments
- Large and Very Large Programs (100-1000 hours) considered starting in Cycle 3
  - Chosen in conjunction with regular TAC process, not a separate call

# The JWST Proposal process

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- JWST proposals require more information *ab initio* than HST Phase I
  - Submitted through Astronomer's Proposal Tool (APT)
  - Proposers must provide sufficient information to compute accurate elapsed times for each program
    - Complete data on target selection, number of exposures, exposure times, dither patterns, filters, readout patterns,...
  - Information is submitted *via* templates for allowed instrument configurations
- JWST follows a Spitzer-like single stream submission process rather than the 2-phase HST process
  - Most proposals are required to be "LRP-ready" on submission
    - Full specification of observations, scheduling constraints and check for guide-star availability
  - Exceptions will be provided for complex programs
- JWST is a complex observatory with complex instrumentation
  - Start working with the proposal tools early!

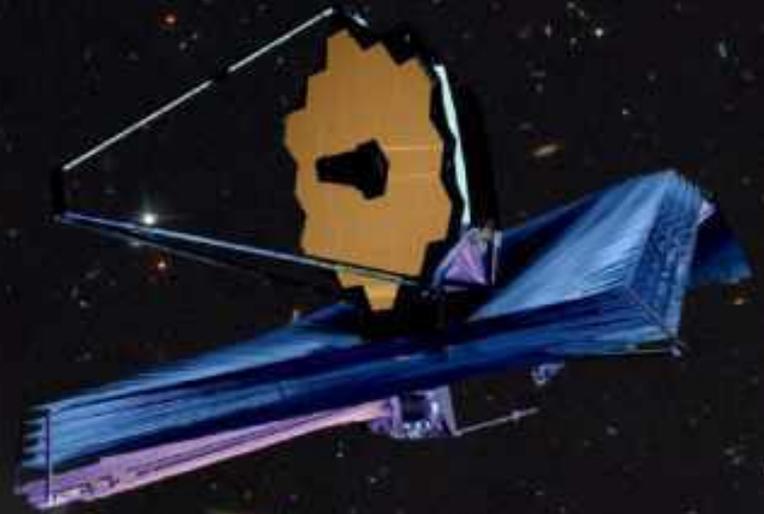
## Summary

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- Cycle 1 GTO program and ERS program are in place, minor updates
- Infrastructure for Cycle 1 GO program is in place
  - And has been given a live test!
- We anticipate re-issuing the Cycle 1 GO Call in late 2019
  - Proposal deadline in Spring 2020
  - Final schedule will be set in consultation with JSTUC

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## What's happened since October 2017?

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- Early Release Science program selected in early November 2017
  - 106 proposals submitted; 13 selected
  - Further details see <https://jwst.stsci.edu/observing-programs/approved-ers-programs>
- Cycle 1 General Observer Call for Proposals released November 30 2017
- Cycle 1 Guaranteed Time Observers observing programs (APT files) finalized
- Cycle 1 General Observer was scheduled for April 6 2018 & TAC for 6/2018
  - TAC essentially completely populated
- The process was paused on March 27 2018 when NASA announced a revised schedule
  - Launch date set as May 2020 based on recommendations from Standing Review Board
  - TAC disbanded & community informed
  - Incorporating results from a “lessons learned” review to improve the proposal process

# Cycle 1 proposal timeline

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- Based on recommendations by the IRB, NASA announced a revised schedule
  - Launch date set as March 30, 2021
- STScI adjusted the Cycle 1 proposal schedule accordingly
  - GO Call will be re-issued in late 2019/early 2020 (allow at least 14 months to launch date)
  - Cycle 1 GO deadline posted as no earlier than February 2020
- GTO proposers will have an opportunity to revise and update their proposals
  - Revisions must be approved as consistent with the current program goals by the Program Scientist for the JWST Program and by the STScI Director
  - Proposals must be finalized 7 months prior to the GO Call being re-issued (NASA Policy 8)
- ERS proposals will also be finalized prior to re-issuing the Cycle 1
  - Currently considering setting the same deadline as for GTOs
- GO proposals schedule will be reset to accommodate some contingency in launch
  - Standard duplication rules apply regarding Cycle 1 GO programs
    - GO Proposers will check for potential duplications using the MAST tool – no spreadsheets
    - Scientifically unjustified duplicate observations will not be permitted
  - All proposals will be processed using the same version of Astronomer's Proposal Tool (APT 28.x.x)

## JWST Users Committee

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Charged with advising STScI and the GSFC JWST Project on all aspects of the observatory

- Chair – James Bullock, UC Irvine
- Members are drawn from the US, Canadian and ESA communities
  - Typically 2-3 years service
- The JSTUC includes representatives of the 4 instrument teams to provide technical insight
  - Those members are not replaced when they rotate off the committee
- Full membership on JSTUC website – **they are your representatives**
- <https://jwst.stsci.edu/science-planning/user-committees/jwst-users-committee-jstuc>

First meeting on September 14 & 15, 2017

- Subsequent telecons in May 2018, July 2018 & January 2019
- Details & presentation on JWST JSTUC website
- Anticipate next face-to-face meeting in May 2019

The JSTUC will continue to advise us as your representatives through launch and into science operations

# JSTUC membership

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## Voting members

Name	Institution	Notes
James Bullock	University of California, Irvine	Chair
Kat Barger	Texas Christian University	
Natalie Batalha	NASA-Ames	
Sadia Caballero-Nieves	Florida Institute of Technology	
Stephane Charlot	Istitute d'Astrophysique	NIRSpec team
Duncan Farrah	Virginia Tech	
Tom Greene	NASA-Ames	NIRCam team
Amanda Hendrix	Planetary Science Institute	
Kelsey Johnson	University of Virginia	
Heather Knutson	California Institute of Technology	
David Lafrenière	Université de Montréal	NIRISS team
Mario Mateo	University of Michigan	
Els Peeters	University of Western Ontario	
Laura Pentericci	INAF, Osservatorio Astronomica di Roma	
Mike Ressler	NASA-JPL	MIRI team
Johan Richard	Université de Lyon	
Tomasso Treu	University of California, Los Angeles	

## Non-Voting members

Name	Institution	Notes
Jean Dupuis	CSA	CSA, ex officio
Pierre Ferruit	ESTEC	ESA, ex officio
Antonella Nota	STScI	ESA, ex officio
Eric Smith	JWST Program Scientist	NASA, Ex officio
John Mather	JWST Senior Project Scientist	NASA, Ex officio
Ken Sembach	STScI, Director	Ex officio
Neill Reid	STScI, Science Mission Office	Ex officio
Alessandra Aloisi	STScI, Science Mission Office	Ex officio
Alistair Glasse	Royal Observatory, Edinburgh	MIRI team observer