WEBB
SPACE TELESCOPE
(Very) Early Science
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The beginning

• JWST has now begun regular science observations
• ERO data released on July 13, new public data almost daily.
• Visit webbtelescope.org for all public outreach content
• jwst.stsci.edu for news, observing schedules, calls for proposals, etc.
Early Release Observations ("First Images")

- Targets prioritized by ERO Committee
  - Representation from NASA, ESA, CSA, STScI
- Include observations from all 4 instruments, highlight contributions from all partners (NASA, ESA, CSA)
- Covering all of Webb’s science themes
- 120 hours of time
  - Unreleased observations to be used for press images in the next couple of months.
- STScI team of >30 scientists, visualization artists, writers, designers
- Observations obtained between June 3 and July 1, 2022
- 5 image releases
  - Exoplanet
  - Star-forming region
  - Planetary nebula
  - Interacting galaxies
  - Deep field
# Mode representation

<table>
<thead>
<tr>
<th>Target</th>
<th>NIRCam imaging</th>
<th>MIRI Imaging</th>
<th>MIRI IFU</th>
<th>NIRSpec IFU</th>
<th>NIRSpec MOS</th>
<th>NRISS SOSS</th>
<th>NRISS WFSS</th>
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<tbody>
<tr>
<td>NGC 3324 (in Carina)</td>
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<td>Southern Ring</td>
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The Early Release Observations and associated materials were developed, executed, and compiled by the ERO production team:

Claire Blome, Hannah Braun, Matthew Brown, Margaret Carruthers, Dan Coe, Joseph DePasquale, Nestor Espinoza, Macarena Garcia Marin, Karl Gordon, Alaina Henry, Leah Hustak, Andi James, Ann Jenkins, Anton Koekemoer, Stephanie LaMassa, David Law, Alexandra Lockwood, Amaya Moro-Martin, Susan Mullally, Alyssa Pagan, Dani Player, Klaus Pontoppidan, Charles Proffitt, Christine Pulliam, Leah Ramsay, Swara Ravindranath, Neill Reid, Massimo Roberto, Elena Sabbi, Leonardo Ubeda

The EROs were also made possible by the foundational efforts and support from the JWST instruments, STScI planning and scheduling, Data Management teams, and Office of Public Outreach.
A few benchmark metrics

- *James Webb Space Telescope*
- *Perseverance*

**Interest over time**

![Graph showing interest over time for James Webb Space Telescope and Perseverance.](image)
Stephan’s quintet
Carina (NGC 3324)
Southern Ring

Spitzer IRAC 1+4

JWST NIRcam

JWST MIRI
HOT GAS GIANT EXOPLANET WASP-96 b
ATMOSPHERE COMPOSITION

WASP 96b
NIRISS SOSS

NIRISS | Single-Object Slitless Spectroscopy
ERS Observations

- GLASS (Treu)
  - Imaging complete
- GOALS (Armus)
  - 14 visits observed (2 scheduled)
- CEERS (Finkelstein)
  - Imaging complete
- TEMPLATES (Rigby)
  - 4 visits observed (1 scheduled)
- Q3D (Wylezalek)
  - One NIRSpec IFU observation
- Exoplanet Transits (Batalha)
  - 2 transits observed (2 more scheduled)
- HCI of planets (Hinkley)
  - 13 visits observed, 6 scheduled
- Jupiter (de Pater)
  - Partly scheduled
- PDRS4ALL (Berne)
  - Not yet observed
- IceAge (McClure)
  - NIRCam WFSS, MRS, IFU, FS observed
- Wolf-Rayet (Lau)
  - 6/9 visits observed, 1 failed + 2 skipped (to be repeated)
- Resolved Stellar Populations (Weisz)
  - Complete
#BeenThere___DestroyedThat
SMACS J0723 Deep Field

- **NIRCam image**
  - 7,500s per filter (2 observed simultaneously)
  - Depth of AB~30 mag at 1-4 micron (point source, 5 sigma)

- **MIRI image**
  - F770W, F1000W, F1500W, F1800W
  - Depth of AB~26.5 mag at 7.7 micron

- Designed to reach Hubble Ultra Deep Field depth, but better due to high ecliptic latitude (-73 degrees) and better performance overall.
Stephan’s Quintet

- NIRCam image
  - 2,400s per filter
  - Depth of AB~29 mag at 1-4 micron (point source, 5 sigma)
  - Almost HUDF levels!
  - 3-tile mosaic for ~150 Mpix
- MIRI image
  - F770W, F1000W, F1500W
• NIRSpec IFU
• R~100 prism
• 1300 s
• MIRI MRS
• 4.9-28 micron
• 900 s

VELOCITY OF GAS NEAR ACTIVE BLACK HOLE

INTERACTING GALAXIES | STEPHAN’S QUINTET

NIRCam and MIRI Imaging

MIRI IFU Medium Resolution Spectroscopy

Argon Ions

Neon Ions

Molecular Hydrogen

Toward

-200
kilometers per second

Away

+200
kilometers per second

0
kilometers per second