



Agency Priority Goal | Action Plan | FY 2023 – Q4

James Webb Space Telescope

Goal Leader(s):

Lead: Science Mission Directorate

Goal Leader: Mark Clampin, Astrophysics Division Director

Deputy Goal Leader: Eric Smith, Program Scientist



Goal Overview

Goal statement

After launch, deployment, and start of science operations, the James Webb Space Telescope will study every phase in the history of our universe, ranging from the first luminous glows after the Big Bang, to the formation of other stellar systems capable of supporting life on planets like Earth, to the evolution of our own solar system. *By September 30, 2023, NASA will complete commissioning of the James Webb Space Telescope, the most powerful and complex space telescope ever built, and begin Webb's Cycle 2 observations.*

Problem to Be Solved

- To launch, deploy, operate the largest-ever cryogenic space telescope, and enable science discoveries.

What Success Looks Like

This observatory is key for meeting the Strategic Goal to expand human knowledge through new scientific discoveries. Webb is NASA's new telescope that will allow us to explore deeper into space and see things that even the Hubble Space Telescope cannot see. Success for the Webb mission and the APG would be:

- Launching the telescope to the second Lagrange point (L2)
- Completing commissioning activities, which includes deploying the primary mirror and sun shield and testing the instruments
- Beginning telescope operations
- Reviewing Cycle 2 proposals
- Beginning Cycle 2 observations

Goal Team

Science Mission Directorate

Associate Administrator: Dr. Nicky Fox
Deputy Associate Administrator: Sandra Connelly

Cosmic Origins/James Webb Space Telescope

Goal Leader: Mark Clampin
Astrophysics Division Director
Deputy Goal Leader: Eric Smith, James Webb Space Telescope
Program Scientist

James Webb Space Telescope

Project Manager: Alan Johns

Goal Strategies

In continuing to work with its partners toward completion of Observatory commissioning and initiation of normal operations, NASA will:

- Complete Telescope commissioning, followed by commissioning of all science instruments, including those of our international partners, the European Space Agency (ESA) and the Canadian Space Agency (CSA).
- Begin normal science operations using the Cycle 1 program of U.S. and international partner led investigations.
- Use the Space Telescope Science Institute to issue a call for Cycle 2 proposals, collect and peer-review those proposals, and formulate the Cycle 2 observing program.
- Inform NASA senior officials and others through a regular series of updates on observatory operations progress.



Tracking the goal

Goal target(s)

In the table below, please repeat the key metrics included in the goal statement (previous slide) that will be used to track progress.

Please update this column each quarter.

Achievement statement		Key indicator(s)	Quantify progress			Frequency
Repeat the achievement statement from the goal statement on the previous slide		A "key performance indicator" measures progress toward a goal target	These values enable us (and you!) to calculate % complete for <u>any</u> type of target*			When is there new data?
By...	We will...	Name of indicator	Target value	Starting value**	Current value	Update cycle
09/2023	Launch the James Webb Space Telescope <ul style="list-style-type: none">Deliver Webb to French GuianaWebb inspection and testingWebb stacked on Ariane 5 rocketSuccessful launchOrbiting L2	Launch	100%	0%	100%	Quarterly
09/2023	Complete commissioning <ul style="list-style-type: none">Telescope fully deployedSunshield and other deploymentMirror segment deployedOptical telescope element commissioningInstruments (NIRCam, NIRISS, FGS) onReady for science/commissioning complete	Commissioning	100%	0%	100%	Quarterly
09/2023	Begin telescope operations <ul style="list-style-type: none">Select Cycle 1 General Observers proposalsBegin telescope operations	Begin operations	100%	0%	100%	Quarterly
09/2023	Review Cycle 2 proposals <ul style="list-style-type: none">Early Release Science products available in public archiveCycle 2 call for proposalsReview Cycle 2 proposals	Review proposals	100%	0%	100%	Quarterly
09/2023	Begin Cycle 2 observations <ul style="list-style-type: none">Award Cycle 2 observation timeBegin Cycle 2 observations	Begin observations	100%	0%	100%	Quarterly



Key indicators



Key milestones

Milestone Summary			
Key Milestone	Milestone Due Date	Milestone Status	Comments
Launch James Webb Space Telescope	FY 2022 Q1	Completed	Launched 12/25/2021
Perform all deployments of the observatory	FY 2022 Q2	Completed	Completed 1/12/2022
Initiate commissioning and operations for all science instruments	FY 2022 Q3	Completed	Completed 4/26/2022
Complete science instrument commissioning and begin normal operations	FY 2022 Q4	Completed	Completed 6/30/2022
Make Early Release Science products available in public archive	FY 2023 Q1	Completed	Completed 7/12/2022
Receive Cycle 2 proposals for second year of Webb Operations	FY 2023 Q2	Completed	Call released November 2022; proposals received January 2023
Conduct review of Cycle 2 proposals	FY 2023 Q3	Completed	Proposals reviewed April 2023; selections announced May 2023.
Begin Cycle 2 observations	FY 2023 Q4	Completed	Completed 7/1/2023

Narrative – FY 2023 Q4

NASA has achieved this priority goal, completing commissioning of the James Webb Space Telescope, the most powerful and complex space telescope ever built, and beginning Webb’s second year of science observations. Webb is now building on its first year of discoveries, with the 249 selected programs for Cycle 2 balanced across a wide range of science topics from asteroids and exoplanets to cosmology.

Built to study the early universe, Webb has already demonstrated the existence of galaxies up to 400 million years after the Big Bang, made robust measurements of metallicity and gas properties of galaxies up to 500 million years after the Big Bang, and discovered a quiescent galaxy at 700 million years after the Big Bang. Early observational signatures of even higher redshift (closer in time to the Big Bang) have been found and are being followed up in Science Cycles 2 and 3, showing that Webb will indeed find the most distant galaxies ever and take us to a time when the universe first began forming stars and galaxies.

While exploring worlds orbiting other stars, Webb has, for the first time, found molecules formed by ultraviolet light from the host star. This is thought to be fundamental for the evolution of planetary atmospheres, including habitable ones like the Earth. Discoveries like these herald a new epoch of exoplanet atmospheric science and weather studies.

The observatory continues to exceed all its mission level requirements for sensitivity, spatial resolution, ability to track moving targets, and expected mission lifetime. Approximately 1200 science papers using Webb data have been submitted for peer review as of the end of FY 2023.

Scientific discoveries based on Webb observations are shared with the public in the form of news releases, which report on results that have undergone peer review, and have been accepted for publication by a reputable scientific journal. However, because this process takes time, NASA also shares with the public observations and preliminary analyses as Early Highlights – a “sneak peek” into groundbreaking discoveries. Both the news releases and Early Highlights are available at <https://webbtelescope.org/webb-science/early-highlights>. The Webb operations site is available at <https://webbtelescope.org/>.

Data accuracy & reliability

Verification and Validation:

- NASA monitors and tracks its progress towards this goal using various Agency documents and reports, including Directorate Program Management Council (DPMC) materials, monthly reports from the project and industry partners, non-profit partners and other program-internal documents.

Data Source(s):

- Emails and program-internal documents indicating progress NASA's industry and non-profit partners make toward the James Webb Space Telescope integration, test and launch.

Level of Accuracy Required for Intended Use:

- Using the documents and reports referenced above, the Agency can accurately report at the end of each quarter on whether it has met its planned milestones.

Data Limitations:

- Materials from the industry partners may include company proprietary information; such information cannot be released publicly.

How the Agency Compensates for Data Limitations:

- NASA has not identified any data limitations that would preclude it from reporting accurate, reliable, and timely performance information.

Additional information

Contributing Programs

Organizations:

- Science Mission Directorate, Cosmic Origins/James Webb Space Telescope
- Space Operations Mission Directorate, Space Communications and Navigation

Other: Webb is an international collaboration among NASA, the European Space Agency (ESA), and the Canadian Space Agency (CSA).

- ESA has provided the Ariane launch vehicle and some of the scientific instruments, the Near Infrared Spectrometer and half of the Mid-Infrared Instrument and operations staff at the Space Telescope Science Institute.
- CSA has provided the Fine Guidance Sensor, which will enable Webb to point precisely, so that it can obtain high-quality images, the Near Infrared Imager and Slitless Spectrograph and operations staff at the Space Telescope Science Institute.
- Northrop-Grumman Aerospace Systems (NGAS) is the main NASA industrial contractor, responsible for building the optical telescope, spacecraft bus, and sunshield, and preparing the observatory for launch. NGAS has led a team including three major sub-contractors: Ball Aerospace, Orbital-ATK, and Harris (formerly ITT Exelis).
- Operations of the mission and its science program are conducted by the Space Telescope Science Institute under contract to AURA, Inc.

Stakeholder / Congressional Consultations

- Regular updates to the Office of Management and Budget (OMB)