

Jwst

Cristina Chaplain

James Webb Space Telescope (JWST): Final Report of the Independent Comprehensive Review Panel (ICRP) ,

Complete Guide to NASA's James Webb Space Telescope (JWST) Project - Report on Spacecraft, Instruments and Mirror, Science, Infrared Astronomy, Independent Review Reports, Congressional Hearings World Spaceflight News, National Aeronautics and Space Administration (NASA), 2017-10-02 Comprehensive coverage of all aspects of NASA's James Webb Space Telescope (JWST), currently under construction and planned for launch sometime near 2018, is provided in this unique compilation of official NASA material. There is complete data on the JWST mission, science investigations, instruments and subsystems, unique mirror technology, the L2 orbit, special gyros, sunshield, infrared astronomy science to be obtained by the JWST, plus in-depth coverage of the funding controversy regarding the large cost overruns and schedule delays encountered by the project - with testimony from Congressional hearings, GAO reports, and the report of the Independent Comprehensive Review Panel (ICRP) along with NASA's response. Contents: PART 1 - JWST Basic Information: Spacecraft And Science Data, Project Status Updates; PART 2 - GAO Reports On JWST; PART 3 - Independent Comprehensive Review Panel (ICRP) Final Report; PART 4 - December 2011 Congressional Hearings on JWST. Dr. Roger Blandford noted in his testimony: JWST (formerly known as Next Generation Space Telescope) is a 6.5 meter diameter telescope. It is much larger than the Hubble Space Telescope (HST-2.4 meter diameter) and unlike HST, it will observe the universe from near the second Lagrange Point, roughly four times as far away from the Earth as the moon but along the opposite direction to the sun. It will be protected from the sun by an elaborate sunshield. JWST is an engineering marvel and its 18 beryllium mirrors will be furled up within a rocket for launch and then deployed at its destination. This operation has to work perfectly as there will be no means of servicing it after launch. The principal scientific goals of JWST are bold and exciting and a culmination of nearly fifty years of extraordinary discovery about the universe and our place in it. They are: - to observe the very first stars, galaxies and black holes which formed at a time when the universe was about four percent of its present age - to discover how stars and planets actually form today within our Galaxy - to study planets orbiting nearby cool stars and assess their habitability However, JWST will also operate as an astronomical observatory and many, and perhaps most, areas of astronomy will be transformed by JWST in much the same way as they have been revolutionized by HST. JWST is specialized to observe in the infrared region of the spectrum. This is relevant because, although much light emitted by the most distant galaxies is in the optical and ultraviolet spectral bands, the wavelengths of this light are stretched roughly tenfold through the expansion of the universe into the infrared band, as we push out to greater distance and earlier times. There is a second reason why it is preferred to observe in the infrared and this is that the star-forming regions that will be intensively studied by JWST are filled with tiny grains of dust. These dust grains absorb and scatter optical and ultraviolet light but leave infrared radiation alone, enabling us to see deep inside them at these wavelengths. In addition, the light that is absorbed by dust will be re-emitted at infrared wavelengths and we can also observe the dust itself as a tell-tale tracer of star formation. As well as being the natural successor of HST, JWST is the infrared successor of the much smaller (0.85 meter diameter) Spitzer Space Telescope, with over 50 times the light-gathering ability and 40 times the resolution as well as the Herschel telescope, led by the European Space Agency, which only observes at longer infrared wavelengths than JWST. Given this huge increase in performance over and complementarity to previous telescopes, JWST promises to be a scientific game changer.

Astrophysics in the Next Decade Harley A. Thronson, Massimo Stiavelli, Alexander Tielens, 2009-02-03 NASA's James Webb Space Telescope (JWST), planned for operation in

about five years, will have the capability to investigate – and answer – some of the most challenging questions in astronomy. Although motivated and designed to study the very early Universe, the performance of the observatory's instruments over a very wide wavelength range will allow the world's scientific community unequalled ability to study cosmic phenomena as diverse as small bodies in the Solar System and the formation of galaxies. As part of preparation to use JWST, a conference was held in Tucson, Arizona in 2007 that brought together astronomers from around the world to discuss the mission, other major facilities that will operate in the coming decade, and major scientific goals for them. This book is a compilation of those presentations by some of the leading researchers from all branches of astronomy. This book also includes a "pre-history" of JWST, describing the lengthy process and some of the key individuals that initiated early work on the concepts that would evolve to become the premier space observatory of the next decade.

James Webb Space Telescope(JWST) Ben Hanks,2022-07-16 This tutorial describes the high-tech construction and scientific capabilities of the Webb infrared telescope in an accessible language The James Webb Space Telescope (JWST) is a space telescope developed largely to tackle infrared astronomy. As the greatest optical telescope in space, its greatly enhanced infrared resolution and sensitivity allow it to observe things too old, remote, or faint for the Hubble Space Telescope. This is designed to enable a broad range of study covering the areas of astronomy and cosmology, such as detection of the first stars and the creation of the earliest galaxies, and full atmospheric characterisation of possible habitation

James Webb Space Telescope United States Government Accountability Office,2017-09-23 JWST is one of NASA's most complex and expensive projects, at an anticipated cost of \$8.8 billion. Now in the midst of significant integration and testing that will last the 2 remaining years until the planned October 2018 launch date, the JWST project will need to continue to address many challenges and identify problems, some likely to be revealed during its rigorous testing. The continued success of JWST hinges on NASA's ability to anticipate, identify, and respond to these challenges in a timely and cost-effective manner to meet its commitments. Conference Report No. 112-284, accompanying the Consolidated and Further Continuing Appropriations Act, 2012, included a provision for GAO to assess the project annually and report on its progress. This is the fifth such report. This report assesses the extent to which JWST is (1) managing technological and developmental challenges to meet its schedule commitments, and (2) meeting its committed cost levels and managing its workforce plans. To conduct this work, GAO reviewed monthly JWST reports, reviewed relevant policies, conducted independent analysis of NASA and contractor data, and interviewed NASA and contractor officials.

Nasas James Webb Space Telescope United States Government Accountability Office,2017-09-13 The National Aeronautics and Space Administration's (NASA) James Webb Space Telescope (JWST) is being designed to explore the origins and nature of the universe. It should allow scientists to look deeper into space-and thus farther back in time-than ever before. The program, however, has experienced cost growth of more than \$1 billion and its schedule has slipped nearly 2 years. NASA recently restructured the program and now anticipates a launch no sooner than June 2013. Because of the cost and schedule problems, under the Comptroller General's authority, we reviewed the JWST program to determine the extent to which this procurement follows NASA acquisition policy and GAO best practices for ensuring that adequate product knowledge is used to make informed investment decisions

Nasa's James Webb Space Telescope U S Government Accountability Office (G,U. S. Government Accountability Office (,2013-08 The National Aeronautics and Space Administration's (NASA) James Webb Space Telescope (JWST) is being designed to explore the origins and nature of the universe. It should allow scientists to look deeper into space--

and thus farther back in time--than ever before. The program, however, has experienced cost growth of more than \$1 billion and its schedule has slipped nearly 2 years. NASA recently restructured the program and now anticipates a launch no sooner than June 2013. Because of the cost and schedule problems, under the Comptroller General's authority, we reviewed the JWST program to determine the extent to which this procurement follows NASA acquisition policy and GAO best practices for ensuring that adequate product knowledge is used to make informed investment decisions.

James Webb Space Telescope United States Government Accountability Office, 2013-01-22 The National Aeronautics and Space Administration (NASA) has provided significantly more time and money to the James Webb Space Telescope (JWST) than previously planned and expressed high confidence in the project's new baselines. Its current cost estimate reflects some features of best practices for developing reliable and credible estimates. For example, the estimate substantially meets one of four cost characteristics--comprehensive--that GAO looks for in a reliable cost estimate, in part because all life cycle costs were included. The estimate, however, only partially met the other three characteristics--well documented, accurate, and credible--which detracts from its reliability. For example, the estimate's accuracy, and therefore the confidence level assigned to the estimate, was lessened by the summary schedule used for the joint cost and schedule risk analysis because it did not provide enough detail to determine how risks were applied to critical project activities. The estimate's credibility was also lessened because officials did not perform a sensitivity analysis that would have identified key drivers of costs, such as workforce size. Program officials believe that it would have been difficult to fully address all best practice characteristics. GAO believes there is time to improve the estimate and enhance the prospects for delivering the project according to plan. Project officials report that the JWST schedule has 14 months of reserve, which meets Goddard guidance for schedule reserve; however, only 7 of the 14 months are likely to be available for the last three of JWST's five complex integration and test efforts. GAO's prior work shows that the integration and test phases are where problems are commonly found and schedules tend to slip. Given that JWST has a challenging integration and test schedule, this could particularly be likely. The project has made some significant progress in the past year, notably successfully completing development of the 18 primary mirror segments--considered JWST's top technical risk. Nevertheless, ongoing challenges are indicative of the kinds of issues that can require significant effort to address. For example, instrument challenges have delayed the first integration and test effort. In addition, key long-term risks on subsystems with a significant amount of work remaining will not be retired until 2016. Currently, NASA's plan for project oversight calls for one independent mission-level system integration review about 13 months before launch. While this is consistent with what NASA requires for its projects, this approach may not be sufficient for a project as complex as JWST. JWST has taken several steps to improve communications and oversight of the project and its contractors--such as taking over responsibility for mission systems engineering from the prime contractor; instituting meetings that include various levels of NASA, contractor, and subcontractor management; and implementing a new risk management system to allow for better tracking of risks. The enhancements to the oversight of the project are steps in the right direction, but it will take time to assess their effectiveness and ensure that the efforts are sustained by the project in the future. Reductions in travel budgets, however, could require the project to adjust the oversight approach that was adopted as a result of the replan. Additional reductions in travel budgets are anticipated in future years, but officials do not have a plan to address such reductions and their potential impact on continuing the current oversight approach.

James Webb Space Telescope United States Government Accountability Office, 2017-10-05 JWST is one of NASA's most complex and expensive projects, at an

anticipated cost of \$8.8 billion. With significant integration and testing planned until the launch date, the JWST project will need to address many challenges before NASA can conduct the science the telescope is intended to produce. GAO has made a number of prior recommendations to NASA, including in December 2012 that the project perform an updated joint cost and schedule risk analysis to improve cost estimates. NASA initially concurred with this recommendation, but it later indicated that the tracking of information it already had in place was sufficient and ultimately decided not to conduct another joint cost and schedule risk analysis. GAO was mandated to assess the program annually and report on its progress. This is the third such report. This report assesses, among other issues, the extent to which (1) technical challenges are impacting the JWST project's ability to stay on schedule and budget, and (2) budget and cost estimates reflect current information about project risks. To conduct this work, GAO reviewed monthly and quarterly JWST reports, interviewed NASA and contractor officials, reviewed relevant policies, and conducted independent analysis of NASA and contractor data.

How We Made JWST Maynard Hurley, 2020-10-18 One of humankind's most significant technical achievements was the moon landing from the sixties. But what has NASA been up to lately, you might ask. Well, for the past twenty years, NASA has been quietly building the James Webb Space Telescope. The technical challenges are unrivaled, even by the incredible moon landing, some fifty years ago. When the Origami Telescope unfolds in October 2021, taking on the dimensions of a tennis court, it will be 100 times more powerful than the legendary Hubble Space Telescope. Moreover, it's a time machine, so sophisticated that we can look at the delicate signatures of the past, some 14 billion years ago! This fantastic tool is a product of the skillful hands and ingenious minds of over 2000 talented engineers, scientists, and technicians. Humankind will soon see the universe as never before. This book recounts the actual work out in the shop. Maynard, as the leader in the optical shop, describes the processing details surrounding JWST Optical Fabrication. What is optical fabrication? You might ask. Optical fabrication is the grinding and polishing steps used to create the telescope's mirrors. All large observatory telescopes use reflective mirror surfaces to manipulate the faint light from the Cosmos. JWST is no different. The specifics, however, are unique for this observatory. Often the details of creating some of the world's most intriguing inventions are lost to the ages. Consider the Egyptian pyramids or even the more recent Hubble Space Telescope. We may know about the science that Hubble has supported, but if you look for the construction details, good luck! We have the specifics for the JWST mirror making chronicled here. It is improbable that you are an optical fabricator, or even less likely, a large mirror maker. This book is for the curious, the engineers, the scientists, and the nerds. It is a behind-the-scenes look into the very specialized creation of off-axis aspheric surfaces in lightweighted Beryllium substrates. Sorry, did your eyes cross? Okay, if you're still reading this, enjoy! Maynard

Exploring The Cosmos: The Revolutionary James Webb Space Telescope Daniel Triana, 2023-09-25 Embark on an exhilarating journey through the vast cosmos with *Exploring The Cosmos: The Revolutionary James Webb Space Telescope*. This captivating book unveils the future of astronomy and astrophotography, where the unimaginable becomes tangible. Prepare to be awestruck by the remarkable James Webb Space Telescope (JWST), a marvel poised to revolutionize our understanding of the universe. With awe-inspiring imagery that transcends human imagination, this technological masterpiece will capture celestial wonders like never before. Witness galaxies as they're born, delve into the mysteries of black holes, and explore distant exoplanets teeming with potential for life. In this compelling exploration of possibilities, readers will experience firsthand how JWST pushes the boundaries of human knowledge and propels us towards a deeper comprehension of our place in the cosmos. As we stand on the precipice of extraordinary discoveries, join us in celebrating this magnificent instrument that promises to unveil

secrets hidden among the stars. Introducing the James Webb Space

Jwst 2024 Richard Perez, 2024-02-21 Depths of 19 nearby galaxies as seen by the James Webb Space Telescope (JWST), the most advanced astronomical instrument ever built by humans. Readers are invited to lose themselves in the breathtaking beauty and complex dynamics of the spiral galaxies that make up our neighborhood in space with every turn of the page. With the JWST's unprecedented capabilities, this book (JWST 2024) provides an unmatched window into the cosmic fabric. It delves deeply into the delicate waltz of gas and dust that makes up the cosmic nurseries where stars are created, as well as the gravitational dance of black holes at the center of these spirals of galaxies. Beautiful high-resolution photos and knowledgeable commentary highlight every facet of these astronomical masterpieces, from the imposing grand design spirals to the fascinating barred spirals. However, *Cosmic Visions* is a journey into the interconnection of the universe rather than just a pretty picture. It explores the deep impact of dark matter on the history of the cosmos and provides insight into the enigmatic mechanisms guiding galaxy growth. This book opens our eyes to the cosmos and helps us comprehend our position in it better by revealing the function of the interstellar medium, the cosmic storehouse of gas and dust. Including: **Magnificent Imagery:** The infrared images captured by JWST reveal the universe's grandeur with never-before-seen clarity and detail. **Galactic Portraits:** in-depth analyses of all 19 spiral galaxies, emphasizing their distinctive features and best kept mysteries. **Expert Insights:** From star formation to the impact of supermassive black holes, astronomical viewpoints provide comprehensive explanations of the cosmic processes forming these galaxies. Discover the inner workings of the scientific theories and technology achievements that underpin the ground-breaking discoveries made by JWST in *The Science of Observation*. **A Cosmic Context:** Examine the connections between the secrets of our nearby galaxies and the structure and beginnings of the cosmos. JWST 2024 is meant to enlighten, excite, and spark your imagination regardless of your level of experience as an astronomer or your general fascination with space exploration. We invite you to reflect on the great beauty and complexity of our universe as we reveal the hidden wonders and secrets of the cosmos. Come along on this cosmic voyage with us.

James Webb Space Telescope Update Terry D Blair, 2024-01-16 JAMES WEBB SPACE TELESCOPE UPDATE is a comprehensive guide capturing the latest advancements and discoveries of the James Webb Space Telescope (JWST). This book delves into the recent findings as of 2024, exploring the JWST's groundbreaking observations and their profound implications in the field of astronomy. Readers will journey through the fascinating insights into the early universe's quasars, the dynamic Beta Pictoris star system, and the enigmatic brown dwarfs. The book also examines the intriguing 'Green Monster' in the Cassiopeia A supernova remnant, a collaborative discovery with the Chandra X-ray Observatory. With detailed analysis, this book is an invaluable resource for enthusiasts and professionals alike, offering a deeper understanding of the universe and the JWST's role in unraveling its mysteries. It is a testament to human ingenuity and a glimpse into the future prospects of space exploration and astrophysics.

James Webb Space Telescope U.s. Government Accountability Office, 2017-07-27 JWST is one of NASA's most complex and expensive projects, at an anticipated cost of \$8.8 billion. With significant integration and testing scheduled in the 3 remaining years until the planned launch date, the JWST project will need to continue to address many challenges and identify problems, many likely to be revealed during its rigorous testing to come. The continued success of JWST hinges on NASA's ability to anticipate, identify, and respond to these challenges in a timely and cost-effective manner to meet its commitments. Conference Report 112-284 included a provision for GAO to assess the project annually and report on its progress. This is the fourth such report. This report assesses (1) the extent to which JWST is meeting its schedule commitments and (2) the current cost status of the

project, among other issues. To conduct this work, GAO reviewed monthly JWST reports, reviewed relevant policies, conducted independent analysis of NASA and contractor data, and interviewed NASA and contractor officials.

James Webb Space Telescope Cristina Chaplain, 2014-02-10 The James Webb Space Telescope (JWST) is one of the National Aeronautics and Space Admin.'s (NASA's) most complex and costly science projects. Effective execution of the project is critical given the potential effect further cost increases could have on NASA's science portfolio. The project was rebaselined in 2011 with a 78% life-cycle cost estimate increase -- now \$8.8 billion -- and a launch delay of 52 months -- now Oct. 2018. GAO has made a number of prior recommendations, including that the project perform an updated cost and schedule risk analysis to improve cost estimates. This report assesses the (1) extent to which the JWST project is meeting its cost and schedule commitments and maintaining oversight; (2) current major technological challenges facing the project; (3) extent to which cost risks exist that may threaten the project's ability to execute as planned; and (4) extent to which the JWST project schedule is reliable based on scheduling best practices. Tables and figures. This is a print on demand report.

James Webb Space Telescope U.s. Government Accountability Office, 2017-07-27 JWST is one of NASA's most complex and costly science projects. Effective execution of the project is critical given the potential effect further cost increases could have on NASA's science portfolio. The project was rebaselined in 2011 with a 78 percent life-cycle cost estimate increase - now \$8.8 billion - and a launch delay of 52 months - now October 2018. GAO has made a number of prior recommendations, including that the project perform an updated cost and schedule risk analysis to improve cost estimates. GAO was mandated to assess the program annually and report on its progress. This is the second such report. This report assesses the (1) extent to which the JWST project is meeting its cost and schedule commitments and maintaining oversight, (2) current major technological challenges facing the project, (3) extent to which cost risks exist that may threaten the project's ability to execute as planned, and (4) extent to which the JWST project schedule is reliable based on scheduling best practices. GAO reviewed relevant NASA and contractor documents, interviewed NASA and contractor officials, and compared the project schedule with best practices criteria.

Astronomy in the 21st Century Anthony M Acevedo, 2022-08-07 The James Webb Space Telescope (JWST) is an observatory that was built primarily for infrared astronomy. The JWST is explained most understandably in this book, *Astronomy in the 21st Century*. It provides more information on the details and goals of the JWST. The Hubble Orbit Telescope can't see things that are too early, far away, or dim, but the James Webb Space Telescope can because of its vastly increased infrared resolution and sensitivity. It is the greatest optical telescope in space. In the area of astronomy, researchers continue to advance. The JWST is anticipated to enable a wide variety of cosmological and astronomical inquiries, including careful observation of the creation of the first stars and galaxies and detailed atmospheric characterization of potentially habitable exoplanets. Astronomy enthusiast Anthony M. Acevedo provides a thorough study of the James Webb Space Telescope based on his two decades of telescope stargazing. Want to know more about it? Click the BUY NOW button! It's...nominal

James Webb Space Telescope , 2014 JWST is one of NASA's most complex and expensive projects, at an anticipated cost of \$8.8 billion. With significant integration and testing planned until the launch date, the JWST project will need to address many challenges before NASA can conduct the science the telescope is intended to produce. GAO has made a number of prior recommendations to NASA, including in December 2012 that the project perform an updated joint cost and schedule risk analysis to improve cost estimates. NASA initially concurred with this recommendation, but it later indicated that the

tracking of information it already had in place was sufficient and ultimately decided not to conduct another joint cost and schedule risk analysis. GAO was mandated to assess the program annually and report on its progress. This is the third such report. This report assesses, among other issues, the extent to which (1) technical challenges are impacting the JWST project's ability to stay on schedule and budget, and (2) budget and cost estimates reflect current information about project risks. To conduct this work, GAO reviewed monthly and quarterly JWST reports, interviewed NASA and contractor officials, reviewed relevant policies, and conducted independent analysis of NASA and contractor data.--Highlights.

James Webb Space Telescope Diane Lindsey Reeves,2024-01-01 The James Webb Space Telescope is giving us glimpses into the vast reaches of space. Orbiting the sun, the powerful telescope can view galaxies that are thirteen billion light years from Earth! Find out how it is bigger and better than the Hubble telescope and prepare to be amazed at its intergalactic discoveries.

James Webb Space Telescope Cristina Chaplain,2014-01-19 The James Webb Space Telescope (JWST) is one of the National Aeronautics and Space Administration's (NASA's) most complex and expensive projects, at an anticipated cost of \$8.8 billion. With significant integration and testing planned until the launch date, the JWST project will need to address many challenges before NASA can conduct the science the telescope is intended to produce. In 2012 GAO recommended that the project perform an updated joint cost and schedule risk analysis to improve cost estimates. NASA later indicated that the tracking of information it already had in place was sufficient and decided not to conduct another joint cost and schedule risk analysis. This report assesses, among other issues, the extent to which (1) technical challenges are impacting the JWST project's ability to stay on schedule and budget; and (2) budget and cost estimates reflect current information about project risks. Tables and figures. This is a print on demand report.

Jwst Book Review: Unveiling the Magic of Language

In a digital era where connections and knowledge reign supreme, the enchanting power of language has become more apparent than ever. Its power to stir emotions, provoke thought, and instigate transformation is truly remarkable. This extraordinary book, aptly titled "**Jwst**," published by a highly acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound effect on our existence. Throughout this critique, we shall delve in to the book is central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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