JWST Statements of Support in Professional Organizations

- AURA Statement
- House Committee on Commerce, Justice, and Science Markup Materials
- Statement by Senator Barbara Mikulski
- American Astronomical Society (AAS) Statement
- Letter from Dr. William Smith to Appropriations Committee
- Statement by Steny Hoyer
- Statement by Donna Edwards
- Space Telescope Science Institute Activities

AIA – Aerospace Industry Association (Draft)

Statement by Garth Illingworth on proposed JWST Cancellation

MEDIA Highlights

Wired.com
http://www.wired.com/geekdad/2011/07/why-you-need-to-help-save-the-james-webb-space-telescope-geekdad-weekly-rewind/

New York Times
http://www.nytimes.com/2011/07/07/science/07webb.html

http://www.nytimes.com/2011/07/10/opinion/sunday/10sun2.html

Discover Magazine – by Julianne Delcanton
http://blogs.discovermagazine.com/cosmicvariance/2011/07/07/why-we-need-the-james-webb-space-telescope/

Space Politics
http://www.spacepolitics.com/category/congress/

The Guardian (UK)
http://www.guardian.co.uk/science/2011/jul/09/nasa-james-webb-space-telescope

http://www.guardian.co.uk/science/blog/2011/jul/11/james-webb-space-telescope

PC Magazine
http://www.pcmag.com/article2/0,2817,2388293,00.asp

Space News
http://www.spacenews.com/civil/110708-house-proposal-kill-webb-showdown-senate.html

Post Tribune

The Atlantic
http://www.theatlantic.com/technology/archive/2011/07/as-the-shuttle-mission-ends-analyzing-the-cost-of-exploration/241586/

Time Magazine
http://techland.time.com/2011/07/08/house-pitching-death-of-hubble-space-telescope-successor/

http://www.time.com/time/health/article/0,8599,2082793,00.html

Baltimore Sun
http://weblogs.baltimoresun.com/news/local/politics/2011/07/hoyer_dont_cut_goddard_telesco.html

http://weblogs.baltimoresun.com/news/local/politics/2011/07/lawmakers_resist_telescope_cut.html

Vancouver Sun
http://www.vancouversun.com/technology/space-shuttle/news+Canada+could+scrap+space+telescope/5067942/story.html

Scientific American
http://www.scientificamerican.com/blog/post.cfm?id=threat-of-james-webb-space-telescop-2011-07-07&print=true

Vanity Fair
http://www.vanityfair.com/online/daily/2011/07/its-like-the-house-appropriations-committee-subpanel-doesnt-even-think-deep-space-is-that-cool.html

Stamford Advocate
http://www.stamfordadvocate.com/news/article/Mikulski-calls-Webb-termination-vote-shortsighted-1456682.php

The Hill

http://thehill.com/blogs/hillicon-valley/technology/170211-panel-votes-to-cut-space-telescope

BBC News
http://www.bbc.co.uk/news/science-environment-14073222

AFP
http://www.google.com/hostednews/afp/article/ALeqM5gLvaDP1TmYcCWXpml9ZEnLzE1K8w?docId=CNG.15e6fb7b6a41f06eb05223cc51ca0fe9.4d1

MSN on Space
http://www.msnbc.msn.com/id/43744128/ns/technology_and_science-space/

RedOrbit
http://www.redorbit.com/news/space/2076552/james_webb_telescope_funding_in_danger/

Optics.org
http://optics.org/news/2/7/9

AURA REACTION TO PROPOSED CANCELLATION OF JWST

July 6, 2011

Today, AURA strongly objected to the proposal by the House Commerce, Justice, and Science Subcommittee to terminate the James Webb Space Telescope (JWST). JWST remains the world's foremost effort to push the boundaries of astronomy and astrophysics.

Over the past year, NASA managers and the science community have undertaken a concerted effort to establish a budget and technology plan that allows the launch of JWST by 2018. The proposal by the Congress to terminate the program comes at a time when these efforts are coming to fruition. In addition, in June, NASA contractors completed the polishing and fabrication of all of the JWST mirrors completing one of the most challenging technical hurdles.

In commenting on the proposed cancellation, Dr. William S. Smith, President of the Association of Universities for Research in Astronomy said "Against a backdrop of widespread discussion over the future of NASA and the human spaceflight program, it is tragic that the Congress is also proposing to curtail NASA's science program. JWST is NASA's premier science facility, unsurpassed by any other telescope now or in the future."

Dr. Dan Clemens of Boston University, Chair of the AURA Board, said "The science community has planned and eagerly anticipated JWST since it was identified as the highest priority astronomy program over a decade ago. The importance of its science has only increased since then. I hope that this year's final appropriations bill will provide the needed support to complete this program."

The U.S. House of Representatives
COMMITTEE ON
APPROPRIATIONS
Chairman Hal Rogers

Appropriations Committee Releases the Fiscal Year 2012 Commerce, Justice, Science Appropriations

Updated 07/07/11

Washington, Jul 6 -

The House Appropriations Committee today released the fiscal year 2012 Commerce, Justice, Science Appropriations bill, which will be considered in subcommittee tomorrow. The bill funds the Department of Commerce, the Department of Justice, the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), and other related agencies.

In total, the legislation contains $50.2 billion in funding. This is a reduction of $3.1 billion or 6% below last year's level, and $7.4 billion or 13% below the President's request for these programs. This total is also 3% below the pre-stimulus, pre-bailout level of 2008.

"This legislation includes funding for some of the most critical aspects of government – the protection of our people here at home, the competiveness of our businesses and industries, and the scientific research that will help America continue to lead the world in innovation. However, given this time of fiscal crisis, it is also important that Congress make tough decisions to cut programs where necessary to give priority to programs with broad national reach that have the most benefit to the American people," House Appropriations Chairman Hal Rogers said.

"I believe the subcommittee mark achieves significant spending reduction goals while at the same time preserving core priorities. Within a tight allocation, we have focused resources on the most critical areas – fighting crime and terrorism; and boosting U.S. competitiveness through investments in science. Despite the difficult choices that were made, this legislation includes a number of positive initiatives to create jobs by promoting economic growth and innovation here at home," Commerce-Justice-Science Appropriations Subcommittee Chairman Frank Wolf said.

For the subcommittee draft text of the legislation, please visit:
http://appropriations.house.gov/UploadedFiles/CJSFY12_SUBC_xml.pdf

For a summary table comparing the bill with last year's level and the President's request, please visit:
http://appropriations.house.gov/UploadedFiles/FY_2012_CJS_Summary_Table.pdf

Bill Highlights:

National Aeronautics and Space Administration (NASA) – NASA is funded at $16.8 billion in the bill, which is $1.6 billion below last year's level and $1.9 billion below the President's request. This funding includes:

- $3.65 billion for Space Exploration which is $152 million below last year. This includes funding above the request for NASA to meet Congressionally mandated program deadlines for the newly authorized crew vehicle and launch system.
- $4.1 billion for Space Operations which is $1.4 billion below last year's level. The legislation will continue the closeout of the Space Shuttle program for a savings of $1 billion.
- $4.5 billion for NASA Science programs, which is $431 million below last year's level. The bill also terminates funding for the James Webb Space Telescope, which is billions of dollars over budget and plagued by poor management.

FOR IMMEDIATE RELEASE
July 7, 2011

CONTACT:
Rachel MacKnight
202-228-1122

MIKULSKI STATEMENT ON HOUSE APPROPRIATIONS SUBCOMMITTEE TERMINATION OF JAMES WEBB TELESCOPE

WASHINGTON, D.C. -- ***U.S. Senator Barbara A. Mikulski (D-Md.)*** *today released the following statement on funding for the James Webb Telescope:*

"Today the House Appropriations Subcommittee on Commerce, Justice, Science and Related Agencies passed a bill that would terminate the James Webb Space Telescope, kill 2,000 jobs nationwide and stall scientific progress and discovery. It was a shortsighted and misguided move.

"The Webb Telescope will lead to the kind of innovation and discovery that have made America great. It will inspire America's next generation of scientists and innovators that will have the new ideas that lead to the new jobs in our new economy.

"The Administration must step in and fight for the James Webb Telescope."

In the next step of the House Appropriations process, the funding bill will be considered by the Full Appropriations Committee on July 13.

American Astronomical Society
Advocates for science since 1899

AAS Statement on the James Webb Space Telescope

Submitted by AAS on Thu, 07/07/2011 - 15:02 Page Tags:
Executive Office

Adopted 7 July 2011

The proposal released on July 6 by the House Appropriations Subcommittee for Commerce, Justice, Science and Related Agencies to terminate the James Webb Space Telescope would waste more taxpayer dollars than it saves while simultaneously undercutting the critical effort to utilize American engineering and ingenuity to expand human knowledge. Such a proposal threatens American leadership in the fields of astrophysics and advanced space technology while likely eliminating hundreds, if not thousands, of high-tech jobs. Additionally, this proposal comes before the completion of a revised construction plan and budget for a launch of JWST by 2018. The United States position as the leader in astronomy, space science, and spaceflight is directly threatened by this proposal.

The JWST is the highest-ranked mission in the National Academy of Science's Astronomy and Astrophysics decadal survey released in 2000 and remains a high priority for the Nation's astronomers in this decade as well, as the revolutionary successor to the Hubble Space Telescope. This survey, conducted once every 10 years by hundreds of the Nation's leading scientists, prioritizes -- based on scientific merit and impact -- projects proposed by the scientific community that require significant government support for completion. These reports represent a community consensus on the efforts necessary to advance our knowledge of the universe. The potential of JWST to transform astronomy underlies many of the activities recommended in the 2010 decadal report released last August. JWST is designed to observe well beyond Hubble's capabilities. It is expected to serve thousands of astronomers in the coming decades to revolutionize our understanding of our place in the Universe, just as Hubble has done since its completion and launch just over two decades ago.

The JWST's completion, launch, and operation will unveil new knowledge about the earliest formation of stars and planets and on a wide range of additional advanced scientific questions, including many not yet formulated. As was true with the Hubble Space Telescope, recognized as a tremendous success by the public, scientists, and policy-makers, building the most advanced telescopes comes with the risk of unexpected costs and delays. However, the whole Nation can rightly take pride in the engineering and scientific accomplishment that the completion and launch of such instruments represents. With the help of important international partners, we are the only nation that could lead such an effort; we should not shirk from completing the project when the most difficult engineering challenges have already been overcome. As stated in the Casani report, an independent review of

project readiness completed late last year, "The JWST Project has made excellent progress in developing the difficult technologies required for its successful operation, and no technical constraints to successful completion have been identified." The mirrors stand ready and waiting for integration into the spacecraft. The telescope has passed both preliminary design review and critical design review. It is time to complete construction and look ahead to JWST's launch and science operations.

The American Astronomical Society calls upon all members of Congress to support JWST to its completion and to provide strong oversight on the path to this goal. Too many taxpayer dollars have already been spent to cancel the mission now; its benefits far outweigh the remaining costs. We must see the mission through. We are a great nation and we do great things. JWST represents our highest aspirations and will be one of our most significant accomplishments.

ASSOCIATION OF UNIVERSITIES FOR RESEARCH IN ASTRONOMY, INC.

AURA

Suite 450
1212 New York Avenue NW
Washington, DC 20005
TEL: 202-483-2101
FAX: 202-483-2106

OPERATING FOR THE
NATIONAL SCIENCE FOUNDATION

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National Optical Astronomy Observatory
Tucson, Arizona & La Serena, Chile

National Solar Observatory
Sunspot, New Mexico & Tucson, Arizona

OPERATING FOR THE NATIONAL AERONAUTICS
AND SPACE ADMINISTRATION

Space Telescope Science Institute
Baltimore, Maryland

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California Institute of Technology 1972
Carnegie Institution of Washington 1997
Fisk University 2010
Georgia State University 2008
Harvard University 1957
Indiana University 1957
Instituto de Astrofisica de Canarias 2005
Iowa State University 1992
Johns Hopkins University 1982
Kiepenheuer-Institut für Sonnenphysik 2005
Massachusetts Institute of Technology 1981
Michigan State University 1997
Montana State University 2005
New Jersey Institute of Technology 2010
New Mexico State University 1999
Ohio State University 1957
Pennsylvania State University 1990
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Stony Brook University 1986
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University of Hawaii 1978
University of Illinois 1980
University of Maryland 1986
University of Michigan 1957
University of Minnesota 1995
University of North Carolina at Chapel Hill 1995
University of Texas at Austin 1972
University of Toronto 2004
University of Virginia 2003
University of Washington 1986
University of Wisconsin 1957
Vanderbilt University 2010
Yale University 1958

July 7, 2011

The Honorable Harold Rogers
Chairman, Committee on Appropriations
U.S. House of Representatives
H-307, the Capitol
Washington, D.C. 20515

Dear Chairman Rogers,

I am writing on behalf of the Association of Universities for Research in Astronomy (AURA) to express my concern over the proposed termination of NASA's James Webb Space Telescope (JWST). AURA is a consortium of 45 major universities with research interests in the highly competitive field of astronomy and astrophysics. For over twenty years, AURA has conducted the science operations for the Hubble Space Telescope and we have participated in the planning for its successor, JWST.

This is a time when the Administration, the Congress and the public are examining the future of NASA and the prospect of losing our lead in human spaceflight. Against this backdrop, it would be tragic for the Congress to curtail our lead in space science as well. JWST is the centerpiece of NASA's astrophysics program and will be 100 times more powerful than the Hubble Telescope. There is no planned mission by NASA or any other nation that can achieve the science and inspirational goals of JWST. US leadership in science and space is linked to JWST.

An independent review of JWST last year confirmed the value of the investment to date, the excellence of the technology, and recommended a viable path for NASA to correct the identified project management deficiencies. NASA and its contractors have aggressively responded and NASA will formalize the new plan in preparation for the FY13 budget preparation.

The 21-foot diameter primary mirror, the most critical element of the observatory and the largest mirror ever built for space, has already been produced. Overall 75% of the hardware is in fabrication. NASA will fully complete their re-plan this summer with budget estimates that should lead to a launch as soon as 2018. I urge you to reconsider the proposed termination until a full agency wide plan is brought forward.

As the budget process moves forward this year, the Congress and Administration will need to consider a wide variety of measures to address the nation's fiscal problems. It is profoundly unwise to sacrifice our nation's lead in space science in achieving this goal. JWST is of the utmost scientific importance for the future of astronomy, and a valuable symbol of NASA's role in advancing US technology. I hope that the final action for this year's appropriation bill can reinstate JWST.

Sincerely,

William S. Smith, Jr.
President

cc. Honorable Norman Dicks
Ranking Democratic Member

CONGRESSMAN STENY HOYER
THE 5TH CONGRESSIONAL DISTRICT OF MARYLAND

Hoyer to Appropriators: Reconsider Cuts to James Webb Space Telescope

WASHINGTON, DC – Congressman Steny H. Hoyer (MD-5) sent a letter today to Members of the House Appropriations Committee urging them to reconsider their decision to cut funding for the James Webb Space Telescope at NASA Goddard Space Flight Center as they proceed to Full Committee markup next week. Hoyer, whose District includes Goddard, has taken the lead on discussions with Congressman Frank Wolf (R-VA), the Chairman of the Subcommittee on Commerce, Justice, Science, and Related Agencies, and Congressman Chaka Fattah (D-PA), the Ranking Member, on how they can work together to preserve this critical investment in America's space program.

The letter as sent is below.

Dear Chairman Rogers:

The Subcommittee-reported FY2012 Commerce, Justice, and Science Appropriations billeliminates funding for the James Webb Space Telescope (JWST). The JWST is of criticalimportance to the mission of the National Aeronautics and Space Administration's (NASA)Goddard Space Flight Center in my district and is an investment of national and global significance in the future of space astronomy and astrophysics. The full Committee willconsider this bill next week, and I urge the Committee to continue to provide funds for this critical project. Among its merits:

- **Scientific Discovery.** The JWST is designed to be the successor to the Hubble Space Telescope which is presently used by more than 8,000 scientists. Its observational capabilities will allow those scientists to continue their work and support the next generation of discovery.

- **Job Creation.** In addition to supporting researchers, JWST is supporting 2000 full time private sector jobs in 22 states. 500 of these jobs are in Maryland, and 250 at Goddard.

- **U.S. Prominence and Leadership.** JWST technologies are unique to the United States,and will ensure American dominance in space observation.

The Committee has already provided $3 billion for JWST. The telescope is in fabrication with the mirror finished and other components nearly complete. It would be devastating to lose the project at this juncture. It is my hope the Committee can rectify the situation for the benefit of the country.

Sincerely,

Steny H. Hoyer

Member of Congress

Rep. Edwards Opposes Funding Cuts to James Webb Space Telescope

Congresswoman Edwards voiced her opposition to funding cuts that would eliminate the James Webb Space Telescope, which is supporting 2,000 jobs, including 500 in Maryland.

Here are excerpts from the article:

The move drew opposition from some Democrats, who have called it the latest blow to the nation's space program.

“Days before NASA embarks on its final space shuttle mission, we can ill afford to jeopardize both the current and future leadership our country has in space exploration and observation," said Rep. Donna Edwards (D-Md.) in a statement voicing strong opposition to the cuts.

SPACE TELESCOPE SCIENCE INSTITUTE

James Webb Space Telescope Latest News

On July 6th, 2011, the House appropriations committee released a draft bill that proposes a NASA budget reduced by $1.9 billion below the President's 2012 request. Under this bill, NASA's Science Programs will be reduced by $431 million relative to last year's level, and the James Webb Space Telescope (JWST) would be terminated. For those interested, we summarize several important aspects of JWST including the Observatory's current status and expected research impact.

JWST ENSURES LEADERSHIP IN SPACE SCIENCE

JWST is recognized as the successor to the Hubble Space Telescope and will ensure US leadership in space astronomy for the next decade. The telescope is the cornerstone of future space astronomy and is the foundation upon which the 2010 Astronomy Decadal Survey, "*New Worlds, New Horizons in Astronomy and Astrophysics*", was built.

JWST OPENS NEW FRONTIERS IN ASTROPHYSICS

There is no mission planned either by NASA or any other space agency that can achieve the science goals of JWST. These goals are transformative and will open a new era in astrophysics:

- JWST will see the first stars and galaxies, and follow the Universe's ionization history.
- JWST will study the assembly and evolution of galaxies and their dark matter, stars, and metals.
- JWST will find liquid water on planets around other stars.
- JWST will reveal the births of stars and planetary systems.

Astronomers interested in answering the question, "What can JWST do for me?", are encouraged to quantify the telescopes scientific impact through the recently released JWST Exposure Time Calculators. The ETCs include support for all four science instruments and are available at jwstetc.stsci.edu/etc.

JWST PUSHES THE BOUNDARIES OF TECHNOLOGY

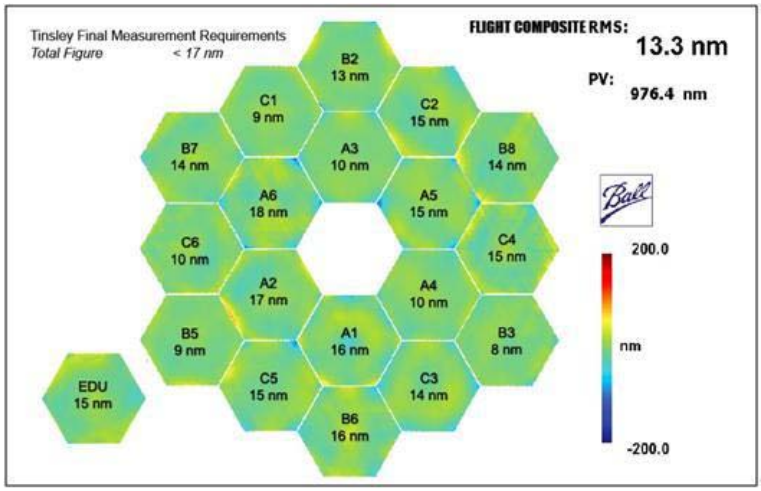
JWST has been a technical success despite being much more challenging than any of NASA's Great Observatories.

- Spacecraft deployment and operation at cryogenic temperatures.

- Spacecraft operations at L2, one million miles from Earth.
- Thermal control requiring a deployable tennis court-sized sunshade.
- 6.5 m deployable mirror.

The Independent Comprehensive Review Panel (ICRP) recently evaluated the project upon Senator B. Mikulski's request, and confirmed the investment to date, the excellence of the technology, and recommended a viable path for NASA to correct the identified project management deficiencies. For example, the ICRP states "...*the JWST project has invested wisely in advancing necessary technologies and reducing technical risk.*" In total, the JWST project required the development of at least 10 new technologies that have now been successfully conquered.

In June 2011, JWST achieved a major milestone. The 18 segments of the 6.5 meter diameter primary mirror, the most critical element of the observatory and the largest mirror ever built for space, have completed final polishing and demonstrate superb performance. Overall, 75% of the telescope hardware is in fabrication.



All 18 JWST segments have been polished and their RMS surface errors meet specification.

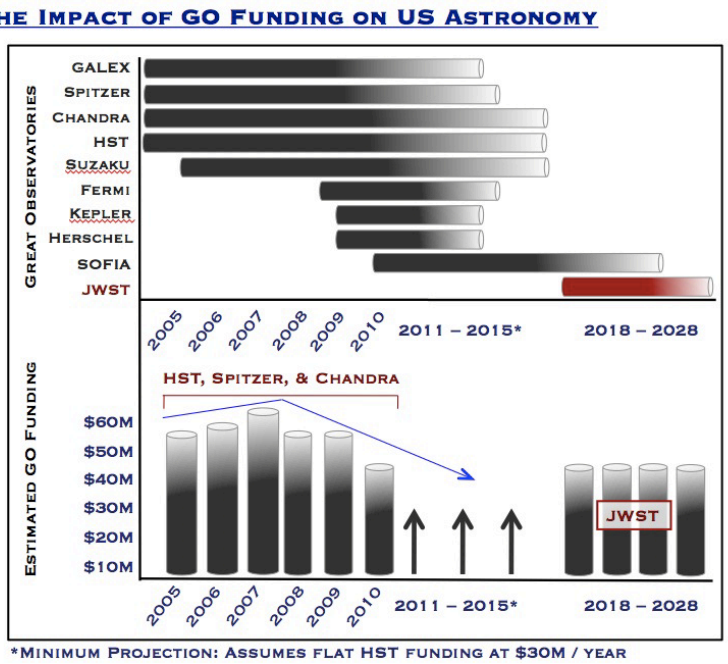
JWST REPRESENTS THE FUTURE SPACE ASTRONOMY FUNDING LINE

General Observer funding through NASA's Great Observatories currently represents 35-40% of all NASA research grant funding. This funding is essential to maintaining the health of the current paradigm of astronomical research, for observers and theorists:

- Provides 1000 new awards to US astronomers per year.
- Supports 8000 astronomers.
- Permits educating 100's of US PhD students in research & instrumentation.
- Provides avenues for postdoctoral researchers to lead high impact projects.
- Supports summer salaries of professors across US Universities.
- Fosters cross-institution collaborative research projects and new initiatives.

- Funded Research leads to >1500 scientific research papers per year.

Although it is unknown how long individual missions will be able to operate, the legacy from the Great Observatories is expected to pass to JWST.



JWST WILL INSPIRE THE NEXT GENERATION OF SCIENTISTS AND ENGINEERS

The Hubble Space Telescope's impact on the public has been legendary and culturally transformative. Hubble has inspired school children around the world and rewritten classroom textbooks. The science results from Hubble inspire many STEM (Science, Technology, Engineering, and Math) programs. JWST is the “Hubble” for the next generation of young scientists and engineers. Its research accomplishments and images will be equally profound and the discoveries will be just as unimaginable. JWST will explore the Universe beyond what Hubble could see.

For more information on JWST, please contact jwstinfo@stsci.edu

NEWS

CONTACT: Alexis Allen
(703) 358-1075 office
(703) 362-0682 cell
Alexis.allen@aia-aerospace.org

FOR IMMEDIATE RELEASE
July 11, 2011

AIA Concerned by NASA, NOAA Cuts

Arlington, Va. — The Aerospace Industries Association is concerned about the substantial cuts being made to the budgets of NASA and NOAA in the House Appropriations Subcommittee on Commerce, Justice and Science markup of the fiscal year 2012 appropriations bill.

"We recognize that tough economic times call for tough choices," said AIA President and CEO Marion C. Blakey. "However, cutting NASA and NOAA this deeply threatens American leadership in space and impairs our ability to make life-saving weather predictions."

The subcommittee's markup cuts NASA's space programs by 10 percent from the president's request and nearly 13 percent from the NASA Authorization passed last October. Given the current fiscal environment, AIA believes the level of funding proposed by the president provides the minimum required for important programs. The Appropriations bill should reflect the policy priorities of the NASA Authorization Act of 2010 as closely as possible.

In addition, NOAA would get $1 billion less than the President's request—an 18 percent cut in a year when storms have already taken hundreds of lives and shown the need for accurate forecasts. It is absolutely crucial to public safety, national security and economic recovery that the President's fiscal year 2012 request for NOAA satellites is fully funded to get observing programs back on track and mitigate any loss in coverage due to aging systems.

AIA is encouraged by continued support for the Orion Multipurpose Crew Module and the Space Launch System; developing new capabilities are essential to NASA's path forward after the space shuttle. However, funding the Commercial Crew budget below authorized levels is shortsighted. "We need to regain independent crew access to the Space Station," Blakey said. "Each seat NASA buys from Russia costs the annual equivalent of 1000 American aerospace jobs."

Furthermore, cancellation of James Webb Space Telescope is especially disappointing—foregoing the successor to the Hubble Space Telescope means

ceding leadership in astrophysics to the rest of the world. We urge the Congress to restore this vital program.

"The health of our space programs has major implications for the innovation economy, the national maintenance of critical skill sets and fostering math and science education," Blakey said. "Supporting NASA and NOAA at stable and predictable funding levels is crucial for mission success, impacting lives, the economy and our nation's security.

-AIA-
News Release 41
7.11.11
Draft

Statement by Garth Illingworth on proposed JWST Cancellation

Hi Folks:

The House Appropriations Committee today released the fiscal year 2012 Commerce, Justice, Science Appropriations bill.

NASA loses nearly $2B in total of which $431 is lost from NASA Science and terminate JWST. The Space science part:

"$4.5 billion for NASA Science programs, which is $431 million below last year's level. The bill also terminates funding for the James Webb Space Telescope, which is billions of dollars over budget and plagued by poor management."

Note that the money is LOST COMPLETELY from Astrophysics and Space Science.

It is for deficit reduction. This is as expected. Every time an astronomy program has been terminated or reduced over the last few years, Astrophysics has lost the funding.

Terminating JWST would the same -

Astrophysics loses all the funding. Yet this termination would go beyond what has happened over the last few years - the funds would be lost to Space Science and NASA also...

This is not the last word. The House Appropriations Subcommittee will consider this bill tomorrow. And the Senate will also have a separate bill on NASA funding. However, in the present climate this step puts the centerpiece of astronomy's future at great risk.

JWST and Astrophysics has entered a very dangerous zone.

The impacts are numerous if JWST is terminated:

1) termination is very damaging for future astronomy and astrophysics scientific productivity and for the pre-eminence of US science;

2) termination would result in no observatory-class mission to carry out broadly-based research when the current Great Observatories reach end-of-life;

3) termination undercuts the Decadal Survey process since it was the top ranked program in the prior 2000 Decadal Survey, and it is identified numerous times in

the 2010 Decadal Survey as a foundational program for future astrophysics research;

4) termination of JWST, as the natural successor to Hubble, would result in the loss, once Hubble fails, of a very large part of the remarkable public interest that astronomy has enjoyed;

5) termination would eliminate a major source of inspirational science education and outreach results, particularly for the interest in STEM (science, technology, engineering and math) that comes from the high profile HST and JWST science results;

6) termination would reduce the strength and visibility world-wide of the US science program, not just astrophysics;

7) termination would reduce US credibility as an international partner given the Canadian and European partnership on JWST and their substantial contributions to the program;

8) termination of JWST, following on from the termination of the SSC (Superconducting Super Collider), would send the message that the US is relinquishing leadership in major science projects -- it will be very difficult to start any other major science project or mission;

9) termination would eliminate the broadly-based research funding for the community that results from the Great Observatory-class missions if none are operating, and greatly reduces opportunities for undergraduate, graduate and post-graduate education;

It is essential that we make our voices heard.

It is particularly crucial that we each act quickly and email, fax or call our local House Representatives and also contact our Senators.

The loss of JWST will affect us all. It will damage the prospects for Astronomy for a decade or more.

Please use any of these points in your own words and any other good arguments that you can think of...

Please distribute widely to your department members and colleagues.

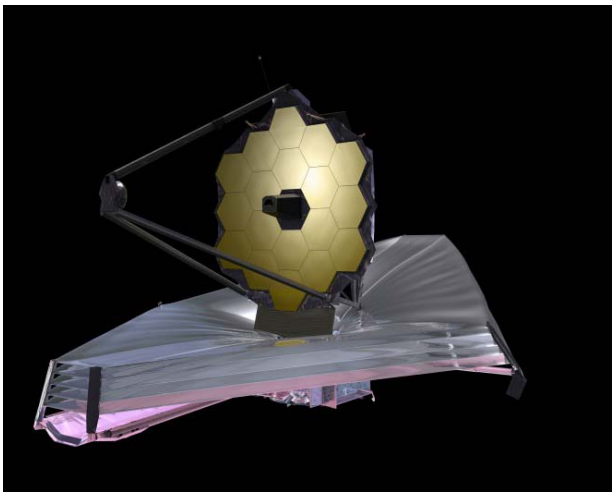
Thanks

Garth

GEEKDAD
RAISING GEEK GENERATION 2.0

Why You Need to Help Save the James Webb Space Telescope

By GeekDad Rewind July 10, 2011 | 9:00 am | Categories: Science and Education



Artist's rendition of JWST. Image: NASA

The latest U.S. House of Representatives appropriations bill seeks to cut funding for NASA by $1.6 billion, and in the process eliminate the James Webb Space Telescope (JWST) project. While it is undeniable that the project has had large cost overruns and is behind schedule, it is also very clear that the project will once complete be a tool of enormous worth to the scientific community — and, through them, to the general population — not just in the U.S. but in the entire world.

JWST was supposed to be finished by June 2014 and to cost about $5.1 billion. An independent review panel, however, last fall determined it would likely cost $6.5 billion and not be finished until September 2015. This is of course not a good thing, but it's nothing new. In fact, there was a NASA project that was supposed to launch in 1983, but didn't make it into space until 1990, and by the time it launched it had cost triple its original budget — about $11 billion in 2011 dollars. In the 21 years since its launch it has cost many billions more in servicing missions.

I refer, of course, to the Hubble Space Telescope, whose cost overruns were outlined in a General Accounting Office (now Government Accountability Office) report in 1992 (PDF). Yes, Hubble has cost the U.S. a substantial amount of money, but its contributions to science have been of incalculable worth: the way we look at the universe has changed in ways we could never have predicted before the telescope's launch.

And JWST will be a much, much better telescope than Hubble, and not just because it has the benefit of decades-better technology. Not only will it be in a much higher orbit than Hubble, but it will be substantially larger and thus able to collect considerably more detailed and more distant observations. Scientists have some educated guesses as to what kinds of discoveries JWST could make, but it's very likely that, as it was with Hubble, many things it will find are so revolutionary they're simply beyond our ability to predict.

This would not be the first time Congress has struck down a major scientific project in the middle of its production. In 1993 Congress eliminated funding for the Superconducting Super Collider (SSC) project because of predicted substantial cost overruns. The SSC would have, had it been completed, been nearly three times the size of the Large Hadron Collider (LHC) in Europe and would have gone online considerably earlier. Who knows where particle physics would be today if the discoveries being made only now with the LHC had been made ten or fifteen years ago?

And it's not just the scientific discoveries made by the final product that are significant: There have been many technological advances made in the process of the telescope's creation, just as there were when Hubble was constructed. It would be senseless to throw away the $3 billion already spent on JWST and to forego discoveries we can only imagine right now.

If you're American, you can help keep NASA funded to complete JWST: First, contact your congressperson online either via email or his/her official website, because the bill has to clear the House first. If it should make it through the House, contact your senators urging them to vote against it. Help them see that, even though the price isn't cheap (although compared to the rest of the budget, it might actually *look* cheap), the knowledge gained from the project's completion will almost certainly make it look like a bargain. And spread the word on Twitter, on Facebook, on Google+, and anywhere else you can think of: This is a project we can't afford to lose. Senator Barbara Mikulski of Maryland, who initiated the study last fall that revealed the cost overruns, has issued a statement strongly opposing defunding the project.

The New York Times

Way Above the Shuttle Flight

New York Times
July 9, 2011

As the space shuttle carries out its final mission to the space station orbiting 220 miles above the globe, NASA's plan to conduct far more important research from a telescope that would be perched almost a million miles from Earth is in trouble.

The James Webb Space Telescope is running way over budget, is way behind schedule and is draining money from other important space science programs. There is no easy solution to this budgetary problem, but it would be premature to terminate the program, as a House Appropriations subcommittee voted to do last week, without taking a much deeper look at whether this immensely important research platform can be saved.

The Webb telescope is the planned successor to the Hubble Space Telescope, which has revolutionized astronomy over the past two decades, discovered hundreds of proto-galaxies, and helped establish the age and expansion rate of the universe. The more powerful Webb telescope is designed to detect even more distant objects and stars being formed even further back in time. The National Academy of Sciences ranked it the highest-priority astronomy research project to be started in the last decade.

When NASA committed to the project in 2008, the Webb was expected to cost $5 billion and be launched in 2014. The expected costs have since soared to $6.5 billion, with the earliest launching date delayed to 2018 if annual funding is increased, and even later if it is not.

While the Webb's cutting-edge technologies cost more than early estimates, its technical development is going well. The problem, a review panel concluded last November, is that an unreasonably low budget and poor management by NASA forced the program to keep deferring work to subsequent years, which drives up costs.

The delays now threaten to gobble up money that would otherwise be spent on other research projects in the coming decade, like a $1.6 billion satellite telescope that would investigate the mysterious "dark energy" that may be accelerating the universe's expansion.

Instead of killing the Webb project, Congress should let NASA accelerate testing to determine whether the complicated instrument is likely to work as expected; most repairs in space would be impossible.

Critics should remember that the Hubble telescope also experienced technical difficulties, cost overruns and a mistake by a manufacturer that created a devastating optical problem until a shuttle crew could repair it. Yet in the end, the Hubble offered a rich scientific payoff. The Webb's scientific payoff could be even richer.

The New York Times

Panel Proposes Killing Webb Space Telescope

By DENNIS OVERBYE
Published: July 6, 2011

The House Appropriations Committee proposed Wednesday to kill the James Webb Space Telescope, the crown jewel of NASA's astronomy plans for the next two decades.

The telescope, named after a former administrator of NASA, is the successor to the Hubble Space Telescope, and it was designed to study the first stars and galaxies that emerged in the first hundred million years or so after the Big Bang.

It was supposed to be launched in 2014, but NASA said last year that the project would require at least an additional $1.6 billion and several more years to finish, because of mismanagement.

Just last week, NASA announced that it had finished polishing all the segments of the telescope's mirror, which is 6.5 meters in diameter, but the agency has still not announced a new plan for testing and launching the telescope.

The announcement of the telescope's potential demise came as part of a draft budget for NASA and other agencies, including the Commerce and Justice Departments. In all, the committee proposed lopping $1.6 billion off NASA's current budget, which is $18.4 billion for 2011. The Obama administration had originally requested $18.7 billion for NASA.

Astronomers reacted with immediate dismay, fearing that the death of the Webb telescope could have the same dire impact on American astronomy that killing the Superconducting Supercollider, a giant particle accelerator in Texas, did in 1993 for American physics, sending leadership abroad.

Canceling the Webb telescope would "have a profound impact on astrophysics far into the future, threatening U.S. leadership in space science," said Matt Mountain, director of the Space Telescope Science Institute in Baltimore, which would run the new telescope. "This is particularly disappointing at a time when the nation is struggling to inspire students to take up science and engineering," he added.

Tod R. Lauer, an astronomer at the National Optical Astronomy Observatory in Tucson, echoed his view. "This would be an unmitigated disaster for cosmology," he said. "After two decades of pushing the Hubble to its limits, which has revolutionized astronomy, the next step would be to pack up and give up. The Hubble is just good enough to see what we're missing at the start of time." The Webb telescope, he said, "would bring it home in full living color."

The Appropriation Committee's proposal was the opening act in what is likely to be a long political drama, in which the Senate will eventually have a say. The measure is expected to be approved Thursday by the subcommittee in charge of NASA and the other agencies, according to Jennifer Hing, a spokeswoman for the committee.

Next Wednesday the full Appropriations Committee will meet again to consider the final bill.

A version of this article appeared in print on July 7, 2011, on page A16 of the New York edition with the headline: Panel Proposes Killing Webb Space Telescope.

DISCOVER®

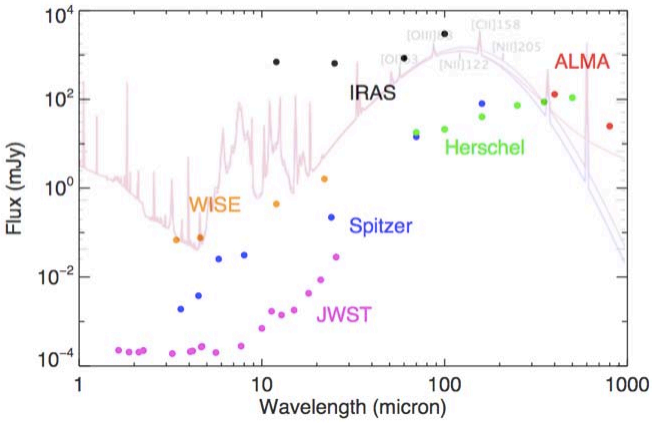
Why We Need the James Webb Space Telescope

by Julianne

Over the last 24 hours, the astronomy community has begun facing the possible cancellation of the James Webb Space Telescope (JWST). The House Appropriations Commerce, Justice, and Science Subcommittee has recommended: "$4.5 billion for NASA Science programs, which is $431 million below last year's level. *The bill also terminates funding for the James Webb Space Telescope, which is billions of dollars over budget and plagued by poor management.*" This is not the end of the game for JWST, as many other branches of government have yet to weigh in, but it's not good news.

Looking at it from the public's view, sure, cutting projects that are "billions of dollars over budget and plagued by poor management" sounds like a pretty reasonable action. But I'd like to try to take a few minutes to explain why it's not as simple as the committee would like you to believe.

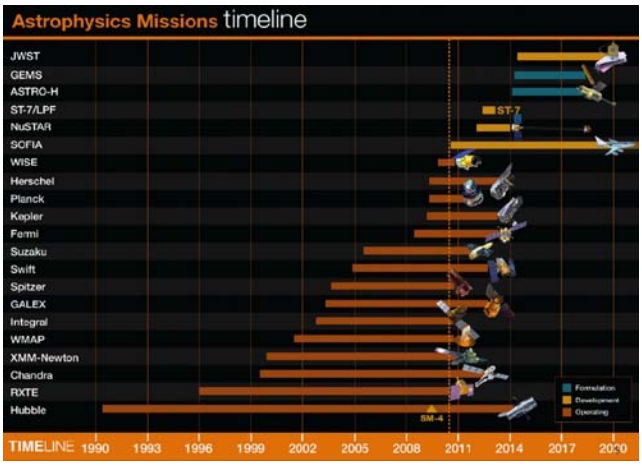
First and foremost, in many fields of astronomy we are rapidly approaching the limit of what can be done scientifically *without* JWST. I recently finished teaching a graduate class on extragalactic astronomy, and I can't tell you the number of times where I brought the students up to speed on the state of a field, and then had to say "If we're going to push this to the next level, we need JWST". To demonstrate this, the plot below shows the brightness (i.e., flux) of an astronomical point source that can be detected with different telescopes in a fixed amount of time, as a function of the wavelength of light (along with a typical galaxy spectrum). The magenta points show that JWST is *hundreds* of times more sensitive than anything out there. In terms of scientific impact, this is like the difference between walking (4 miles/hr) and flying (400 miles/hr) for your ability to explore terrain on the Earth. This is not to mention the drastic increase in the angular resolution of JWST compared to any other telescope on that plot — JWST will be able to see fine-scale structure that has never been seen at these wavelengths.



Moreover, JWST will blow through limits that lie at some of the most exciting areas of astronomy, with some of the widest public appeal, including high redshift galaxies and extrasolar planets. The public rightfully adores Hubble for expanding our view of the universe, but it's not going to last forever. (Given funding constraints, the most likely fate for Hubble is the same as your 20 year old Toyota Tercel — it gets you where you're going, but at some point you stop paying the money to fix the heater, repair the cracked windshield, and deal with the oil leak, and accept that sooner or later you're going to be stranded on the side of the highway.) When Hubble expires — and it will within a decade or less — where is the system that will expand upon the wonders that Hubble revealed? Even Milky Jay knows that JWST is the future.

The demise of JWST would be a huge blow to american space-based astronomy as well. On the ground, the US has ceded much of its historical primacy to the Europeans. If JWST were cancelled, it would be a heavy blow to the US dominance in running true space-based observatories. NASA will continue to run "experiments" in space — i.e., targeted smaller missions focused on limited scientific goals, but they will be giving up their unique place in creating flagship facilities that literally *anyone* can potentially use. The impact of Hubble came in large part because it wasn't a specific experiment for one particular problem. It has broad capabilities, that were kept up to date with servicing missions, but using those capabilities was then essentially "crowd-sourced" to the *entire world*. Through on-going rigorous, and frankly brutal, evaluations of scientific proposals, the community identifies the *single most important scientific questions* to be addressed by Hubble. This process is carried out every. single. year., making sure that Hubble gets the most bang for the buck. The same process also applied to NASA's other "flagship" missions (e.g., Chandra, Spitzer), focused on other wavelengths, but these facilities too are rapidly running out of time.

To see what the loss of JWST would mean, look at the following chart of NASA missions. JWST is the only flagship observatory coming up. If we lose it, the person with the next great idea loses the chance to try it out.



So yes, JWST has cost more than was planned for. But the majority of the cost is now “sunk costs”, and a *huge fraction of the telescope and instruments actually exist*. This is not just a hole that people have been shoveling money into, and not getting anything for — useful stuff is actually built! And working! I would of course prefer that JWST launched on time and under budget, but, given how close we are to the end, I much prefer to go for it. Canceling JWST is *not* going to usher in a golden age of other space-based science opportunities (the “crowding out theory”, where once the shade of JWST is gone, a thousand flowers will bloom). The money will simply be *gone* from space-based astronomy, and instead of a single tree we can *all* climb, there will be some smaller pieces of shrubbery.

Details about the House's proposed NASA budget

July 13, 2011 at 9:34 am · Filed under Congress, NASA

In advance of this morning's markup by the full House Appropriations Committee of its Commerce, Justice, and Science (CJS) appropriations bill, the committee released yesterday its report about the bill, which includes some additional funding details and other items about the bill. Some highlights:

- On perhaps the bill's biggest issue, the proposed termination of the James Webb Space Telescope (JWST) program, the committee effectively states that this move is designed to serve as an example, and warning, that cost overruns on NASA programs in general will not be tolerated in the future. "The Committee believes that this step will ultimately benefit NASA by setting a cost discipline example for other projects and by relieving the enormous pressure that JWST was placing on NASA's ability to pursue other science missions."
- The bill includes $4 million to carry out "descoping studies" for the two highest-ranked planetary science missions in the recent decadal survey, a Mars rover that would cache samples for a future sample return mission and Europa orbiter, moves that are essential to make those missions affordable given projected budgets.
- The bill includes $10 million for NASA to restart production of plutonium-238 needed for radioisotope thermoelectric generators (RTGs) for future planetary missions. But since that work must be done in cooperation with the Department of Energy, which did not get corresponding funding in its House appropriations bill, this could be a moot point.
- For Space Technology, the committee justifies its more than 60 percent cut from the administration's proposal by saying that the proposed growth in this area is "premature", citing the ongoing technology roadmap studies and lack

of “a sustainable budgetary plan for absorbing a new program of such significant size without causing damage to other necessary activities.”

- The bill funds the Space Launch System at $1.985 billion, a little more than the administration’s request but below the authorized level of $2.65 billion. The committee makes clear that the ultimate goal of the SLS is a vehicle that can place 130 tons into orbit, and that any development of a smaller vehicle (in the range of 70-100 tons, as described in the authorization act) must be on the path to that larger SLS. “NASA should not expend funds on design or development of a smaller vehicle that does not add value to the overall SLS effort.”
- The committee also asks NASA to develop a “destination-based approach” to its exploration plans “that would designate a specific target location, such as the Moon, to drive development decisions and timelines going forward.” It’s not clear how this would be different from the president’s stated goals of a human mission to a near Earth asteroid by 2025 and Mars orbit by the 2030s. (No specific asteroid has been identified yet, of course, and it’s even possible that the specific destination hasn’t even been discovered yet.)
- The bill provides $312 million for commercial crew, the same as last year. The committee finds that the administration’s proposal for $850 million is, like that space technology proposal, “premature”, citing a lack of an acquisition strategy for next round of its Commercial Crew Development (CCDev) program. The committee also recommends NASA make use of unfunded Space Act Agreements for the next CCDev round, in addition to funded awards, “to maximize the number of commercial partners who stay engaged with the program and remain in contention for an eventual service contract.”
- The committee, stating its frustration with “the uncertainty of leadership within the Administration on space policy and the resulting lack of focus within NASA itself,” has included $1 million for the Office of the Inspector General to perform “a comprehensive independent assessment of NASA’s strategic direction and agency management,” due 120 days after enactment of the appropriations bill.
- The appropriations bill would also remove restrictions that have kept NASA from carrying out layoffs of its workforce.

More concerns about the House NASA budget

July 9, 2011 at 1:41 pm · Filed under Congress, NASA

As the details about the House Appropriations Committee's proposed FY2012 NASA budget sink in, more individuals and organizations are raising concerns about the budget. The one item that has received the most attention has been the committee's plan to terminate funding for the James Webb Space Telescope (JWST), effectively ending the program. The American Astronomical Society (AAS) released a statement Thursday calling on Congress to "support JWST to its completion" but also "provide strong oversight" for a project that has suffered major cost overruns and schedule delays. "It is time to complete construction and look ahead to JWST's launch and science operations," the AAS statement notes.

The proposed termination of JWST has attracted the attention of Sen. Barbara Mikulski (D-MD), who chairs the corresponding appropriations subcommittee in the Senate. "It was a shortsighted and misguided move," she said in a statement about the House appropriators' decision to kill the project, noting that ending JWST would "kill 2,000 jobs nationwide and stall scientific progress and discovery." She also called on the White House to "step in and fight for the James Webb Telescope."

Rep. Donna Edwards (D-MD) also made similar comments about the attempt to kill JWST. "I worry about the message we send to our students to reach for the stars and pursue careers in the sciences while simultaneously eliminating projects that further research and technology and keep us on the cutting edge of competitiveness," she said.

Rep. Adam Schiff (D-CA) told the *Burbank Leader* that he would move to restore proposed cuts in NASA's budget when the full appropriations committee marks up the budget next week. Schiff, who serves on the CJS subcommittee that proposed the budget, said he was concerned about "dramatic cuts to space technology research and development and other vital efforts" in the budget. The Space Technology account was by over 60 percent from the administration's budget request.

Cuts to space technology as well as potentially to NASA's Commercial Crew Development program are at the heart of a political call to action issued Friday by the Space Access Society. The organization is asking people to contact their

members of Congress by no later than midday Tuesday (in advance of Wednesday's scheduled markup by the full appropriations committee) about full funding for those two programs. "There are lots of cuts coming this year, and the ones who protest the loudest, i.e., generate the most calls, are the ones who may get some of their funding back," the alert notes.

Finally, Rep. Mo Brooks (R-AL) said he would consider voting against the proposed appropriations bill if it reaches the House in its current form. Brooks did not mention objections about specific programs cut in the bill, like JWST, but instead appeared to object to the overall cuts to the agency.

guardian.co.uk | TheObserver

NASA Fights to Save the James Webb Space Telescope From the Axe

Astronomers shocked by House of Representatives' move to scrap deep-space observatory after costs soar to $6.5bn

Robin McKie, science editor
guardian.co.uk, Saturday 9 July 2011 21.05 BST

A Nasa engineer begins final cryogenic testing of the first flight-ready segments of the James Webb telescope. Photograph: AP

Nasa is fighting to save its next-generation space observatory, the James Webb Space Telescope. Politicians want to end the project – one of the most complex ever conceived by space engineers – even though billions of dollars have already been spent on its construction.

Scheduled for launch in 2016, the James Webb, intended to replace the ageing Hubble Space Telescope, would orbit in deep space, a million miles from Earth, and peer into the dawn of the universe. Its observations would answer major questions about the structure of the cosmos, say astronomers.

The cost of the observatory has soared from an initial estimate of $1.6bn (£996m) to more than $6.5bn (£4bn). As a result, budgets for other astronomical research projects have been slashed, leading the journal *Nature* to describe the James Webb as "the telescope that ate astronomy".

Last week the US House of Representatives' appropriations committee on commerce, justice, and science decided that it had had enough of these escalating costs and moved to cancel the project by stripping $1.9bn from Nasa's budget for next year.

A terse statement, released by the Republican-dominated committee, said that the project "is billions of dollars over budget and plagued by poor management". The decision still has to be approved by the full appropriations committee, the House and the Senate. Nevertheless, analysts say the telescope now faces a struggle to survive.

Not surprisingly, the move to scrap the telescope, which has been under construction since 2004 and is named after a former Nasa administrator, has horrified astronomers. The James Webb was intended to be the centrepiece of astronomical research for the next two decades. Its segmented mirror would be almost three times the diameter of the Hubble telescope's, and because it would orbit outside Earth's atmosphere it would be able to make observations of

unprecedented accuracy. This would allow it to capture images from a time when the first stars and galaxies lit up the universe.

Tod Lauer, of the National Optical Astronomy Observatory in Tucson, said: "[Cancellation] would be an unmitigated disaster for cosmology. After two decades of pushing the Hubble to its limits, which has revolutionised astronomy, the next step would be to pack up and give up. The Hubble is just good enough to see what we're missing at the start of time." The James Webb would be able to fill in those gaps, he added.

The problem for engineers working on the telescope has been the complexity of its design. It will primarily gather infra-red radiation because most objects that interest astronomers emit light at these wavelengths. But this is a tricky process. The telescope must be cooled so that its own heat does not interfere with incoming infrared light. Similarly, it must be shielded from radiation from the Earth and the Sun, and so placed in deep space far beyond the point where it can be reached by astronauts.

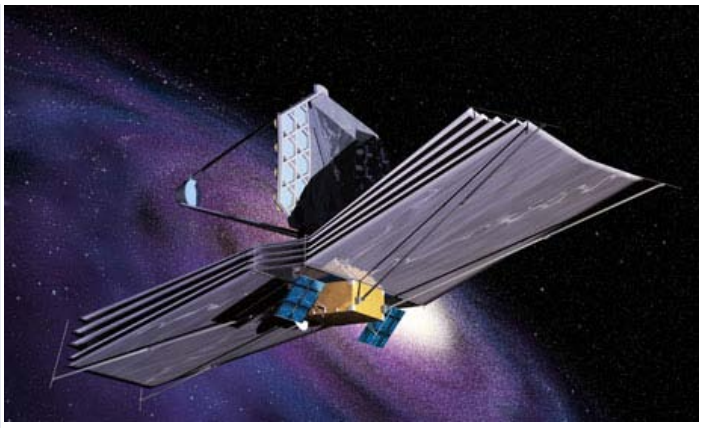
Axing the project would have an impact beyond the US, however. Many other countries have committed large amounts of time and money to building components for the telescope. One example is the Mid-Infrared Instrument (Miri), which would analyse light gathered by planets forming from dust clouds around stars. This is a joint US-European project which has two project leaders, one British and one American.

Sarah Kendrew, a member of the Miri team, said she had been working on the project for four years. "We should be ready to ship the instrument to Nasa by the end of the year," she said. "All we can do is finish the job, I suppose, and give as much support as we can to our colleagues over there."

guardian.co.uk | TheObserver

To scrap the James Webb Space Telescope would be short-sighted

No one now debates whether Hubble was worth its delays and budget overruns, and yet its successor the James Webb Space Telescope now faces the axe for similar reasons

o 

An artist's impression of the James Webb Space Telecope. Photograph: European Space Agency

The Hubble Space Telescope was launched in 1990 as Nasa's flagship observatory and was the largest to be flown in space at that time. In the early stages of the project, Hubble was plagued by technical delays and budgetary problems. Its troubles continued after launch, and a manned rescue mission was sent to fix Hubble's optics at huge expense. Twenty years on, it is hard to overstate the impact that Hubble has had on science, and on the public imagination. Yet today the US government is on the brink of scrapping Nasa's successor to Hubble, the multi-billion dollar James Webb Space Telescope (JWST).

Hubble's images have graced the front pages of our newspapers, inspired thousands to look at the sky and think about our place in the universe. They've even been made into high-fashion dresses worn by the wife of Britain's prime minister, Samantha Cameron. If you've seen any pictures of stars, nebulae or galaxies in the past 20 years, there's a good chance they were taken by Hubble.

Don't let the pretty pictures fool you: Hubble is a formidable scientific observatory, and its data has revolutionised our understanding of the universe. Competition to use its instruments is fierce as ever. But at 20 years old, Hubble is nearing retirement. JWST's main mirror has more than six times the area of Hubble's, and the telescope is designed specifically to push ahead in those areas where Hubble made its biggest breakthrough contributions. The performance we can expect from JWST is so much better than any similar instrument or telescope on the horizon. Its impact is almost certain to rival that of Hubble.

Last Thursday, the subcommittee in the US House Appropriations Committee responsible for the science, commerce and justice budget passed a bill with little fanfare that would withdraw all funding for the mission, following criticism of top-level management and

budget overruns. It's just the first step in what is likely to be a drawn-out drama, in which the bill will be bounced around between various committees in House and Senate for months to come. A tough battle for the JWST's survival lies ahead.

What would cancellation mean for science, and for society? To me, the Hubble experience is key. What would we have missed in the past 20 years without Hubble?

Hubble's observations have proven crucial in many of the most significant scientific breakthroughs in recent history, with important contributions stretching across all areas of astronomy. Its early observations in the 1990s of galaxies in the distant universe have launched one of the most active fields in astrophysics research today, the study of galaxy evolution throughout cosmic history. For the first time galaxies other than our close neighbours could be imaged in such detail that we could see their shapes, sizes, even watch their stars blink and explode, and measure their distances. With Hubble's newest instruments, we've been able to look back more than 13bn years in time, when the universe was just a couple of hundred million years old. That is simply incredible.

Hubble's exquisite image quality also provided the first visual confirmation of the existence of planets around other stars in the Milky Way. This provided a huge impetus to the rapidly expanding field of exoplanet studies and the search for life elsewhere in the universe. Importantly, Hubble's entire data archive is open to everyone, and Nasa hosts a huge archive of its images that are free to download and use. As a result, Hubble has found its way into popular culture, fashion, art and education, more than any other scientific instrument before. The observatory has inspired a generation of children, including myself and many of my peers, to take an interest in science and technology. That, to me, is as important as the scientific results Hubble has produced.

Today, the James Webb Space Telescope's mid-infrared instrument (MIRI), which I've worked on for a number of years, is nearly completed. The instrument is currently undergoing its final run of tests at the Rutherford Appleton Laboratory in Oxfordshire before we send it off to our NASA colleagues for integration with the telescope.

MIRI is without question the most advanced mid-infrared instrument ever built for astronomy, under the joint scientific leadership of the UK Astronomy Technology Centre in Edinburgh, the University of Arizona and Nasa. After years of work, it's very special to see MIRI's data coming in, albeit in the lab, and looking just the way we intended.

Needless to say, seeing JWST among the "extraneous, duplicative and unnecessary programmes" that the House has proposed to cut comes as a shock.

The crucial point to the proposed budget is that the money taken from the JWST mission is removed from the Nasa budget entirely. It will not go into other missions or research grants. Some $3bn has already been spent in the US alone, simply to be written off. Around 2,000 US jobs are thought to be on the line. The European Space Agency is a 15% partner in JWST, its Canadian counterpart will contribute over $100m. The stakes here in Europe are high too.

Hubble cost several billion dollars more than initially planned, and its launch was delayed by almost a decade. Yet now, 20 years on, no one debates whether those funds were well

spent. Will its successor leave the same legacy? And, more importantly, can we afford not to find out?

It's hard to see who will be better off if JWST really is axed. For scientists, its loss will slow progress in understanding the physics that governs the universe at a time when huge advances are within our reach. Engineers, who have successfully completed many aspects of the observatory, will see more than a decade of work go to waste.

The public will lose the opportunity to marvel once again at the amazing place that is our universe: the thousands of planets that populate our own galaxy, the places where new suns are born, the first galaxies at the dawn of time. We'll all miss out on the opportunity to inspire a new generation of scientists by simply being capable, as a species, of launching this fantastic telescope into space and seeing the things it will see.

Frankly, I think cost-saving exercises don't come much more short-sighted than this. Whatever the problems with the mission, I think it's our duty to find a solution that will see JWST launched. I hope the US government will come to the same conclusion.

Sarah Kendrew is an engineer at the Max Planck Institute for Astronomy in Heidelberg, Germany, where she is a member of the Adaptive Optics Lab and the Planet and Star Formation Group

What We Could Lose if the James Webb Telescope Is Killed

PC Mag
ARTICLE DATE: 07.08.11
By Peter Pachal

NASA's James Webb telescope, the successor to the Hubble, is on the chopping block. With the U.S. Congress arguing over fiscal matters, one of the things that may get cut is NASA's budget, with the expensive James Webb telescope potentially getting the ax. If that happens, a generation of scientific discoveries about the nature of the universe may need to be put on hold.

Right now the future of the Webb telescope, scheduled to launch in 2018, is uncertain. Congress is looking to cut costs, and NASA's budget could be cut by as much as $1.6 billion (or about nine percent of its overall budget). Such a big cut would certainly be the death knell for the Webb telescope, which has so far cost $3 billion but whose final price is expected to hit the $6.8-billion mark.

"The cost overruns are driven by a couple things," says Rick Howard, the program director of the James Webb Space Telescope at NASA. "We've had ten or so technologies that needed to work in order to have this kind of telescope—mirrors actuators, the sunshade. We've made great progress, but it's taken longer and it's been harder than we thought. We've had to invent new adhesives for carbon fiber because what we thought was the right chemical equation didn't work at all. Another source was inadequate early funding of reserves."

Seeing in Infrared

With the Webb in jeopardy, its mission to find out more about the nature of the universe may be postponed. The telescope is fundamentally different from Hubble, scanning the infrared spectrum rather than visual light. Being able to see in infrared is the key to the Webb making new discoveries. For example, it will be able to penetrate dust clouds that are opaque to normal telescopes.

But seeing in infrared is also one of the reasons the Webb is so expensive. Since all objects emit some infrared light, the telescope needs to be positioned much farther from the earth than normal satellites to shield it from potential interference. In fact, the Webb will ultimately be four times further from the earth than the moon. At such a long distance, servicing the telescope will be impossible, says NASA, so it cannot afford any screw-ups or design flaws. As such, testing the Webb's components is extremely detailed.

"We are very concerned about that," says Howard. " There's a huge amount of testing that goes on. We've gone to great lengths to build both sub-scale and full-scale prototypes in order to be able to make sure we fully understand this design. In addition to that we have a lot of testing going on of the flight unit."

What We'll Lose With the Webb

Once it's in place, though, the Webb is quite literally expected to unlock a universe of discoveries. Positioned so far from the Earth and shielded from outside infrared interference, the telescope will be able to see things the Hubble never could. Chief among them: seeing back in time. Since light only travels so fast, the further you look out, the further you look back. The Webb is expected to be able to peer into some of the universe's earliest moments, before even stars existed. This could give insight into how the cosmos came into being.

On top of that, the Webb is going to be looking at how the first galaxies were formed. From observations from Hubble and other telescopes, we know know most galaxies have huge black holes at their centers, but questions remain about how this symbiotic pairing of black holes and stars emerges. The answer likely has to do with "dark matter," the term for the missing matter in the universe that scientists can observe the gravitational effects of, but can't see directly. By looking into the formation of galaxies, the Webb may unlock the secrets of this mysterious substance.

"We'll be looking at the very first stars and galaxies in the universe, which right now are very fuzzy little blobs on the deepest images with Hubble," says Howard. "Not just seeing them, but getting [good] resolution on them. Because it'll be able to look back at the earliest galaxies, it'll be able to see how dark matter has affected light as it travels to us."

Finally, the Webb may help answer the question of whether life exists elsewhere in the universe. The telescope will be able to see better than ever before planets in other star systems and more importantly—which ones have water. A planet with large amounts of water is a prime candidate for life, and the Webb could point us right to them.

"[We'll] be able to look at those planets and look at the spectra, the composition of the atmosphere, the composition of water— it's something only the [James Webb telescope] will be able to do," Howard says. "It'll be able to tell water in the atmosphere, maybe even on the surface."

Looking Back at Hubble

All of its potential discoveries come at a price, however, and it may be one Congress isn't willing to pay. The risk factor is high, too, since the telescope must

set itself up perfectly at a vast distance from the earth. If anything goes wrong, it's billions in wasted taxpayer dollars.

In considering the fate of the Webb, it's informative to look back at Hubble, which led to almost two decades of cosmological discovery. Besides finding those galactic black-hole nuclei, Hubble's observations revealed the age of the universe, the repulsive force known as "dark energy," and that planets are common.

"When we launched Hubble, no one thought that it would be able to make the observations and discoveries that it has," Howard says. "Hubble's the only telescope that has ever made an actual observation of a planet orbiting another star. Nobody else has done that. When we launched Hubble, no one had even thought dark energy existed.

"The discovery space is huge for this observatory."

SPACE NEWS
INTERNATIONAL

House Proposal To Kill Webb Telescope Sets Stage for Showdown with Senate

Space News
8 July, 2011
By Dan Leone

WASHINGTON — Congressional backers of the James Webb Space Telescope (JWST) are preparing to defend the flagship NASA science mission against House budget hawks who intend to pull the plug on the project as part of a broad swath of NASA budget cuts unveiled July 6.

The proposal to kill JWST is included in the NASA portion of a 2012 spending bill that cleared the House Appropriations commerce, justice, science subcommittee July 7. Rep. Frank Wolf (R-Va.), the subcommittee's chairman, gave no explanation for the cut during the hour-long markup session that preceded a voice vote to send the bill to the full committee for consideration July 13. But in a statement released ahead of the markup, appropriators said they were denying funding for JWST because the program "is billions of dollars over budget and plagued by poor management."

Supporters of the project, notably Wolf's counterpart on the Senate subcommittee in charge of NASA appropriations, immediately sallied forth to defend the troubled science mission.

"Killing the James Webb Space Telescope is shortsighted and misguided," Sen. Barbara Mikulski (D-Md.), who chairs the Senate Appropriations commerce, justice, science subcommittee, said in a July 7 statement. "The Administration must step in and fight for the James Webb Telescope."

Mikulski has been a fierce advocate for the Webb telescope, which is being developed at the Goddard Space Flight Center in Greenbelt, Md., and would be operated in orbit by the Space Telescope Science Institute in Baltimore.

Mikulski's subcommittee has yet to unveil its appropriations bill for 2012.

Meanwhile, Rep. Adam Schiff (D-Calif.) told Space News July 7 that he has "an amendment to try to restore funding on key projects like Webb," which he will introduce when the subcommittee's bill goes before the full House Appropriations Committee. Schiff, whose congressional district includes NASA's Jet Propulsion Laboratory, got his spot on the House Appropriations Committee in 2007.

JWST's price tag has been spiraling upward and its launch date has been slipping to the right for years. The project entered the implementation phase — in which the bulk of construction and testing occurs — in 2008. It was then expected to cost $4.5 billion and launch in 2014.

A cradle-to-grave estimate completed last fall by an independent panel established at Mikulski's request concluded JWST would cost $6.5 billion and launch no sooner than September 2015. NASA Administrator Charles Bolden in April told Mikulski's subcommittee that the agency could not afford the $1.5 billion short-term cash infusion recommended by the panel and that the telescope might not launch until 2018, given its funding troubles.

NASA Deputy Administrator Lori Garver, speaking at a July 7 press conference at the Kennedy Space Center in Florida, said the agency is prepared to lay out a revised plan in the next budget cycle that would permit the launch of JWST "within the next decade."

NASA's 2012 budget proposal, submitted back in February, asked Congress for $375 million for JWST for the coming year — hundreds of millions less than what the independent review said the program would need to keep the launch from slipping beyond 2015. The 6,500-kilogram telescope is being designed to launch aboard an Ariane 5 rocket as part of the European Space Agency's contribution to the program.

The House subcommittee's call for terminating JWST is part of a broader proposal to roll back overall NASA spending to $16.8 billion for 2012, or some $2 billion below the agency's request and $1.6 billion less than it received this year. About one-fourth of the proposed reductions would come out of NASA's science program, which would receive $4.5 billion next year — $513 million less than the president's request — under the subcommittee's bill. Assuming the NASA cuts clear the House intact, they must be reconciled with any changes adopted by the Senate before final spending legislation can be sent to Obama to be signed into law.

While lawmakers debate JWST's future, work continues on the infrared telescope long billed as the successor to the Hubble Space Telescope. Most recently, prime contractor Northrop Grumman Aerospace Systems said the JWST team had completed polishing the telescope's mirrors. JWST has a 6.5-meter foldable mirror, in addition to a deployable, tennis court-sized sunshield.

The Association of Universities for Research in Astronomy, which is funded in part by NASA, decried the proposal to kill JWST.

"Against a backdrop of widespread discussion over the future of NASA and the human spaceflight program, it is tragic that the Congress is also proposing to curtail NASA's science program," William Smith, the group's president, said July 6

in a statement. “JWST is NASA’s premier science facility, unsurpassed by any other telescope now or in the future.”

Despite the support it enjoys in the astrophysics community, others in the space science community have argued that Webb’s ballooning price tag has sucked up funds that otherwise could have enabled numerous, smaller-scale missions.

Post-Tribune
A CHICAGO SUN-TIMES Publication

With shuttles shelved, science education faces new challenge

Post Tribune
By Colleen Sikorski
csikorski@post-trib.com
Last Modified: Jul 9, 2011 02:01AM

After NASA's space shuttle program ends, educators will have to work even harder to show students how molecules and equations in the classroom relate to space exploration and other real-world science fields. Purdue University Calumet and the Challenger Learning Center are both working on projects to help teachers meet the challenge.

"The space program has excited generations of children to pursue careers in science and engineering," PUC physics and science professor Shawn Slavin said. "Without that there, it is really like getting rid of the role model or the celebrity that is the thing that drives people to that field. There isn't much replacement for that."

Slavin and Professor Robert Napora are working together on the Northwest Indiana Robotic Telescope, hoping to booster local middle school and high school science education.

"We're really focused on using the telescope as a way to teach science," Slavin said. "Astronomy is the vehicle because that's what we know. It's an exciting science and it's very visually stimulating."

Challenger Learning Center won't have to make big adjustments to its simulated space missions for school groups and summer camps, marketing director Kristin McKone said. NASA is shifting its priorities to deep space exploration, where Challenger's missions have already been "traveling" to.

"Our mission scenarios we do for fifth through eighth graders aren't based on shuttle," she said. ""One of them is voyage to Mars, which will actually be more relevant."

McKone said, if anything, Challenger's simulated missions will be more relevant in the post-space shuttle era. "The money that gets put into the shuttle program needs to be able to funneled into the deep space exploration," she said. "Maybe this is a good thing. I think it's time to move forward."

The space shuttle program's end could have an upside for Slavin. NASA spent the majority of its budget on manned space flight, and the space shuttle was the main

manned space flight program. The end of the program could mean more money for NASA's other initiatives, such as deep space exploration and funding for astrophysics and astronomy research.

"What I have been hoping is that the emphasis on producing more STEM [Science, Technology, Engineering and Mathematics] education would see a general increase in funding," Slavin said. "Right now, it seems to be mostly lip service."

Slavin also credits the Hubble Telescope, put into orbit and serviced by the space shuttle program, as a key interest generator, and is concerned about future telescope plans. Right now, a bill sits before Congress to de-fund the Hubble's replacement, the James Webb Telescope.

"That is not a good thing," Slavin said. "The images the Hubble has sent back, they're exciting and interesting and stimulating in a way we never had before."

Slavin said he hopes NASA's science initiatives and funding won't be forgotten about.

"The de-emphasis on science and technology that's been made available through NASA is going impact science in the us in a very negative way. It's really a shame. I hope that something will come along to kind of save the day, that someone in the decision making process will wake up and say this is important to us."

As the Shuttle Mission Ends, Analyzing the Cost of Exploration

The Atlantic
July 8
By Lane Wallace

Private industry has little reason to invest in endeavors where the result is not returns, but greater scientific knowledge or understanding

Sometime Friday, or in the next few days, weather and mechanics permitting, the very last Space Shuttle mission will depart the launch pad at the Kennedy Space Center. For some, this marks a great loss in our national vision, capability and space endeavors. To my mind (and I've written six books on NASA history, so I have at least a bit of background on the subject), the ending of the Shuttle program is merely an ending of a chapter -- and a less-than-overwhelmingly productive chapter, at that.

In an article on the closing down of the Shuttle program in Tuesday's *Science Times*, space writer Dennis Overbye called the Shuttle "the space truck to nowhere." Fun for the astronauts involved, somehow cool to think humans were still leaving the planet but ... with the notable exceptions of servicing the Hubble Space Telescope and a couple of other satellites ... an era rather devoid of any astounding expansions in science, understanding or capability." It's why commercial companies may well be able to take over the bulk of the relatively simple (relative being the operative word, there) low Earth orbit experiences and supply missions.

But exploration of the cosmos still takes an enormous amount of commitment and investment. Which is to say ... money. Federal, government money.

Leaving the planet is still a vastly difficult and risk-laden operation -- note the difficulty that the commercial space companies SpaceX and Orbital Sciences (who are developing commercial space vehicles and launch systems) have had developing successful rockets and launching them on schedule. But enabling humans to see the Earth from space and taking supplies to low Earth orbit are not cutting-edge exploratory missions. They're an engineering challenge, to be sure, but NASA has already greatly reduced the risks involved through its 30 years of testing, improving and flying the Shuttles. That's what NASA is supposed to do. Go somewhere first, and in cases where technology might hold promise for commercial development, reduce the risk of the technologies involved enough so that private industry can, in good stockholder conscience, take on the risk of developing commercial applications of that technology.

But what of the greater human mission of exploration? Of boldly going where no one has gone before? Of taking great risks to discover great new worlds, or capabilities or understanding? The sobering fact is that actually may be at risk -- but not because of the ending of the Shuttle program.

Along with the ending of the Shuttle program, this week also marked the one millionth observation by the Hubble Space Telescope. Over the past 20 years, the Hubble, as it's affectionately known, has opened the eyes of scientists and schoolchildren alike to just how vast, mysterious and glorious the universe really is. It's shown us, in various wavelengths, the composition of stars, exoplanets and patches of the cosmos we once saw only as black spaces in between the visible stars. It has changed the minds of scientists and physicists, let alone the average person, about whether there is, in fact, intelligent life and carbon-based life on other planets besides our own. We may not yet know how to get to those distant planets. But because of the Hubble, we now have a far better idea of how many of those places exist.

We may not yet know how to land a human on an asteroid, as President Obama has challenged NASA and the nation to do by 2025. But a NASA satellite mission called "Dawn," because its mission is to search for information about the dawn of our solar system, has already reached a protoplanet called Vesta in the asteroid belt between Mars and Jupiter -- and is sending back images and data from Vesta daily. We have missions and probes investigating comets, dark matter, black holes, solar flares and other mysterious and powerful phenomena and celestial bodies. We may be using robotic eyes, just as surgeons in one city are now experimenting with doing remote surgery on patients residing somewhere else. But what those eyes are discovering is far more compelling and assumption-shattering than anything the Shuttle ever produced, or the Apollo-era space folk even realized existed.

But exploration of the cosmos -- even through robotic eyes -- still takes an enormous amount of commitment and investment. Which is to say ... money. Federal, government money. Why government money? For the very same reason national laboratories, NASA, and its predecessor, the National Advisory Committee on Aeronautics, were formed in the first place. Private industry has no incentive to invest in endeavors where either: a) the result is greater scientific knowledge or understanding, but nothing that has any hope of a fiscal return on investment, or b) cutting-edge technology whose development is so nascent that its incorporation into commercial products is simply too risky to attempt.

So the disturbing piece of news in Thursday's *New York Times* was not the article about the ending of the Shuttle program. It was the article just below it (for those of us who still read the print version of our daily newspapers) about the House Appropriations Committee's proposal to cancel the James Webb Space Telescope project -- the follow-on telescope being built to replace the Hubble when the Hubble inevitably wears out.

Granted, the Webb project is over budget and behind schedule. But it's worth remembering that the Hubble itself was initially supposed to be launched in 1983 and was significantly over budget by the time it actually reached space in 1990 -- and even then, it still had a defective mirror needing repair. Yet, the Hubble is now one of the few space efforts most people agree was a spectacularly productive investment and achievement, even with those problems. It's estimated that the Webb telescope will require $1.5 billion to complete. But to put that amount in perspective, that's only the equivalent of three Space Shuttle launches. And the Webb telescope holds the promise of far more return on investment, as far as frontier-expanding knowledge is concerned, than most of the Shuttle missions combined.

The Webb is in danger, of course, because of the current budget-cutting fervor on Capitol Hill -- a subject with many tentacles and complexities that go far beyond funding a space telescope. But I think it's worth pointing out that the great achievements of the Apollo Era, which we look back on so nostalgically, and yearn for so pointedly ... took place in a very different federal budget and tax environment. In 1961, when President Kennedy made his famous moon challenge, the top tax rate for the wealthiest individuals in America was approximately 90%, and federal tax revenues totaled 17.8% of the GDP, according to the Office of Management and Budget. In 1966, when the top individual tax rate was reduced to 70%, tax revenues were still 17.3% of GDP. In 2010, the top tax rate for individuals was 35%, and federal tax revenues totaled only 14.9% of the GDP -- the lowest percentage in over half a century, and a number that the OMB estimates will drop even further in 2011.

I recognize that a tax rate is not the same thing as an actual tax paid. And that statistics are surprisingly malleable to support almost any argument a person wants to make, depending on how you set the selection criteria. But no matter how you work the numbers, the point is, not only was there more federal revenue, relative to GDP, in the 1960s than there is now, there was also a much different level of acceptance when it came to individuals contributing to federal infrastructure, systems and programs through taxes. Including the exploration of space.

The wealthy may have grumbled, but there was no revolt over the higher limits on the highest portion of a person's income, and certainly no fight to reduce that rate to below 30%. Conceptually, the idea of the wealthy contributing a higher share of their income (even if in practice, the actual amount was reduced dramatically) to the nation's purposes, was more acceptable, and more accepted, in fact and real numbers.

One can point to companies like SpaceX, co-founded by Elon Musk, who made his money developing PayPal, as an example of wealthy individuals who invested their more closely-kept wealth in entrepreneurial ventures that create jobs. True. But the goal of SpaceX is a commercial utilization of space, not exploration with no financial return in sight. If we want America to explore new scientific horizons and

be exceptional in its national efforts, we need to rethink our death grip on the "mine is mine" philosophy of income and taxes.

A CEO friend of mine in Silicon Valley, who worked as an advisor to a long list of top American companies, often said that you can't cut your way to growth. Even if that weren't true, I would never advocate exploring space at the expense of the basic Medicare and social services that provide a baseline protection to those humans right here on Earth who are most in need. Exploration is a luxury, not a necessity. But we have been most proud of our nation when it endeavored to do great things, and aimed higher than minimizing revenue and operating costs. That's a hard goal to get enthusiastic about.

The Space Shuttle era is ending. Whether anything extraordinary follows will depend, in large part, on whether we can once again get enthusiastic about giving the government the funds it needs not only to take care of the basics here at home, but to aim for the stars, as well.

TIME

House Pitching Death of Hubble Space Telescope Successor

Time Magazine
By Matt Peckham on July 8, 2011

In an attempt to further tighten the national belt, the U.S. House moved this week to cut the James Webb Space Telescope from the budget, effectively threatening NASA's follow-up to the Hubble, and the future of our eyes-in-space program. There's something poetic (poetically dismaying, that is) about the timing, too: Space shuttle *Atlantis* launched just this morning—the last launch of a space shuttle probably ever—signaling the demise of NASA's over 30-year-old shuttle program.

All it took was a voice vote by a House appropriations subcommittee to strip funding for the project. Trouble is, the program was already $1.5 billion and change over budget. It's behind schedule, too. The Webb Telescope should've launched in 2014, but it's currently delayed until 2018.

What's the big deal about yanking a space telescope? For starters, the Webb Telescope's actually more than your average collection of curved mirrors and lenses. In fact it's a full-blown infrared space observatory. Its mission: to scan for light from the very first stars, understand galaxy formation and evolution and study the origins of life in terms of planetary systems. It's also the only thing scheduled to follow the Hubble's mission, which ends (and apparently can't be extended) sometime in 2014.

So should we support the funding cull or protest it? If you're coming at it politically, positions tend to fall along current slash-or-save lines (Democrats want to save it, Republicans want to quash it). But forget the politics of spend-or-save for a moment.

Look at it through *Wired*'s pro-JWST eyes, and you'll hear this sort of argument:

...Hubble has cost the U.S. a substantial amount of money, but its contributions to science have been of incalculable worth... And JWST will be a much, much better telescope than Hubble, and not just because it has the benefit of decades-better technology. Not only will it be in a much higher orbit than Hubble, but it will be substantially larger and thus able to collect considerably more detailed and more distant observations. Scientists have some educated guesses as to what kinds of discoveries JWST could make, but it's very likely that, as it was with Hubble, many things it will find are so revolutionary they're simply beyond our ability to predict.

Or, alternatively, consider *Science 2.0*'s hard-knocks counter-position, arguing that:

Budgets are finite. Everyone knows this except partisans in science. The $1.5 billion that JWST now claims it needs in order to not waste the billions already spent could fund 5,000 basic science research projects in space science (see While Webb Bleeds, Space Science Hemorrhages) and $1.5 billion is just the latest cost overrun, not the total budget that may come up as more engineering concerns arise - so rather than circle the wagons around this project because it is science and people want to avoid a slippery slope, scientists can do a world of good holding each other accountable and making it less necessary for politicians to do so.

I share the spirit of the first quote, but sympathize with the practical sense of the second. If the JWST is in fact an artifact of sloppy budgets or bureaucratic hobgoblins, we need to restructure the system so that craziness like going over budget by more than $1.5 billion can't happen. Budgetary compliance shouldn't be political. If we're so shortsighted that budgets have to overspill by billions for admittedly ultra-complex projects like the JWST, well, Houston, meet problem.

I can't say what the right position on JWST is since it's already well along (according to the *Baltimore Sun*, one Democrat argues the project is 75% complete and that it supports 2,000 jobs, including 500 in Maryland), but if the long-term fix means we have to do more (or less) with less, so be it.

TIME

After Hubble: Will Budget Woes Kill NASA's Next Great Telescope?

Wednesday, Jul. 13, 2011
By Michael D. Lemonick

Over the past hundred years or so, the science of astronomy has been utterly predictable, in an utterly unpredictable sort of way. Decade after decade, telescopes got steadily bigger and more powerful, and expanded their range beyond ordinary visible light into the hidden realms of ultraviolet, infrared, radio waves and more. And with every one of those leaps, astronomers discovered something unexpected and astonishing — massive black holes spewing blasts of energy into space, tiny neutron stars spinning a thousand times a second, dark matter pushing galaxies around like toys, and even the afterglow of the Big Bang at the dawn of time.

It was fun while it lasted. Last week, a House subcommittee proposed to kill off funding for the James Webb Space Telescope. The new instrument — which would orbit the sun just a little farther out than the Earth — is the heir apparent to the Hubble Space Telescope, NASA's flagship space-science project. Some kind of second act was always seen as a good idea, but the folks on the Hill have a right to be exasperated with the way this one is turning out: the Webb, originally proposed in the mid-1990s under the name the Next Generation Space Telescope, was supposed to launch by 2007 and cost about $500 million. But it's gotten progressively more expensive, less powerful and further behind schedule. An independent review board reported last November that the poorly managed Webb (uninspiringly renamed after a former NASA administrator) could end up costing up to $6.8 billion and wouldn't launch until 2015 at the earliest. With the Republican-dominated House determined to slash spending everywhere it can, the Webb is a nice, juicy target.

It's not as though astronomers were completely thrilled with the Webb either, whose voracious appetite for money has sucked in about 40% of the agency's budget for space science. The telescope is the gorilla in the living room whose very

existence has forced NASA to postpone or cancel other important projects — among them, a telescope called the Terrestrial Planet Finder, which would have searched for signs of life on earthlike worlds.

But that just makes the cancellation of the Webb seem worse. "It's a double whammy," says Natalie Batalha, a high-ranking member of the science team for the Kepler probe, the spectacularly successful planet-hunting mission that's been delivering discovery after discovery since its 2009 launch. "The whole community has sacrificed to fund [the James Webb Space Telescope]. Everyone was unhappy, but we all knew how valuable it would be. And now you have Congress talking about canceling it."

What makes the Webb so valuable is, first of all, its huge light-gathering mirror — more than 21 ft. (6.4 m) across, compared with Hubble's 7.8 ft. (2.4 m). It's so big that the mirror can't go up as a single piece of glass. Instead, it's made of 18 smaller mirrors that will unfold in space to form a mosaic. Since fainter objects are also generally older and more distant, the Webb will be able to study galaxies, dust clouds, and cosmic processes at the earliest stages of the history of the universe.

Better yet, unlike the Hubble telescope, the Webb is designed to see mostly in infrared light — the kind emitted not only by distant galaxies but also by planets. The telescope won't be able to take pictures of earthlike planets at distant stars — they're too faint and too close to their stars, even for the Webb — but it can pick out bigger planets and give astronomers a sense of what they're made of and how they formed.

Beyond that, scientists have already made enormous progress on the project, not only on manufacturing the mirrors for the Webb but also in developing electronic cameras to take maximum advantage of those mirrors — the same sort of technology that lets the Hubble take such fantastic images and do such extraordinary science. After so much money has been sunk into the work, it would be insane, say scientists, to throw it all away.

Certainly, Congress has swallowed a loss on such sunk costs before. Back in 1993, it pulled the plug on the Superconducting Super Collider (SSC), a mammoth particle accelerator that could have unraveled the mysteries of the subatomic realm. The reason: cost overruns, delays and a sense that solving such esoteric

mysteries was an impractical extravagance. The SSC is now a vast, $2 billion doughnut-shaped tunnel beneath the ground in Waxahachie, Texas.

Frugality wasn't a crazy justification then, and it's not entirely crazy now. You can argue that particle physics or astronomy have valuable spin-offs — jobs for the people who build telescopes and accelerators, for example, and technological innovations that can move into the private sector. But you can also argue that there's no need for the U.S. to spend on projects that might well be on parallel tracks elsewhere. The Large Hadron Collider over in Europe may not be as powerful as the SSC would have been, but it will still do science and the knowledge will be available to us just as if the work had been done in Texas. Europe builds space probes and huge ground-based telescopes; so does Japan. So maybe we don't have to.

On the other hand, even the budget cutters in Congress would probably agree that it's a good thing for America to be the world's leader in science and technology. And they might even agree, if pressed, that plenty of things are worth doing simply because they enrich the human spirit. Back in 1969, the Cornell particle physicist Robert Wilson went before Congress to testify in favor of building an earlier generation of accelerator. How, a Senator asked him, would this project help improve the security of the country?

"It has nothing to do directly with defending our country," answered Wilson, "except to make it worth defending."

THE BALTIMORE SUN
LIGHT FOR ALL

Lawmakers Resist Telescope Cuts

Baltimore Sun
July 7, 2011

Maryland lawmakers are pushing back on a proposal advanced Thursday in the Republican-led House of Representatives to cut funding for the James Webb Space Telescope, which supports hundreds of jobs at the NASA Goddard Space Flight Center in Greenbelt.

A House appropriations subcommittee with oversight of NASA and other federal agencies approved by voice vote a spending bill that would strip funding for the project, which is the successor to the Hubble Space Telescope. The program is more than $1.5 billion over budget and its launch has been delayed to 2018 at the earliest.

The spending legislation demonstrates "our commitment to restoring austerity, restraint and thoughtfulness to the" spending process, House Appropriations Committee Chairman Hal Rogers, a Kentucky Republican, said in a statement. Without mentioning the telescope directly, Rogers said the legislation eliminates "extraneous, duplicative and unnecessary programs."

Maryland Democrats called the move shortsighted. Rep. Donna F. Edwards argued that the project is 75 percent complete and said it supports 2,000 jobs, including 500 in Maryland.

"While there is reasonable cause for concern regarding NASA’s management of the project, eliminating this important and ambitious project is truly short-sighted," the Prince George's County Democrat said in a statement. "I worry about the message we send to our students to reach for the stars and pursue careers in the sciences while simultaneously eliminating projects that further research and technology and keep us on the cutting edge of competitiveness.”

If the bill is approved by the full committee and the House, Sen. Barbara A. Mikulski will play a key role in determining the fate of the project when the legislation arrives in the Senate. The Maryland Democrat is the chairwoman of the Senate appropriations subcommittee that oversees science.

In a tweet on Thursday, Mikulski called the House subcommittee's vote "shortsighted and misguided."

"The Webb Telescope will lead to the kind of innovation and discovery that have made America great," Mikulski said in a statement. "It will inspire America's next

generation of scientists and innovators that will have the new ideas that lead to the new jobs in our new economy."

Rep. Steny Hoyer, whose district includes Goddard, said he spoke with the chairman and ranking Democrat on the subcommittee about the issue. "This cut will have a dramatic impact on local jobs here in the Fifth District and threatens the future of science research," he said.

An earlier version of this post misidentified the House district Goddard is located in.

THE BALTIMORE SUN
LIGHT FOR ALL

Hoyer: Don't cut Goddard telescope

Baltimore Sun
July 8, 2011

Rep. Steny Hoyer, the second-highest ranking Democrat in the House of Representatives, sent a letter Friday to members of the House Appropriations Committee asking them to reconsider the decision to strip funding for the James Webb Space Telescope at the NASA Goddard Space Flight Center in Greenbelt.

A House appropriations subcommittee with oversight of NASA and other agencies approved a spending bill Thursday that would cut funding for the project, which is the successor to the Hubble Space Telescope. The program is more than $1.5 billion over budget and its launch has been delayed to 2018 at the earliest. Maryland lawmakers have been pushing back on the cuts.

“The telescope is in fabrication with the mirror finished and other components nearly complete,” the Southern Maryland lawmaker, whose district includes Goddard, wrote in the letter. “It would be devastating to lose the project at this juncture.”

The full letter, addressed to Rep. Hal Rogers, the Kentucky Republican who chairs the House Appropriations Committee, is available after the jump:

Dear Chairman Rogers:

The Subcommittee-reported FY2012 Commerce, Justice, and Science Appropriations bill eliminates funding for the James Webb Space Telescope (JWST). The JWST is of critical importance to the mission of the National Aeronautics and Space Administration’s (NASA) Goddard Space Flight Center in my district and is an investment of national and global significance in the future of space astronomy and astrophysics. The full Committee will consider this bill next week, and I urge the Committee to continue to provide funds for this critical project. Among its merits:

• Scientific Discovery. The JWST is designed to be the successor to the Hubble Space Telescope which is presently used by more than 8,000 scientists. Its observational capabilities will allow those scientists to continue their work and support the next generation of discovery.

• Job Creation. In addition to supporting researchers, JWST is supporting 2000 full time private sector jobs in 22 states. 500 of these jobs are in Maryland, and 250 at Goddard.

• U.S. Prominence and Leadership. JWST technologies are unique to the United States, and will ensure American dominance in space observation.

The Committee has already provided $3 billion for JWST. The telescope is in fabrication with the mirror finished and other components nearly complete. It would be devastating to lose the project at this juncture. It is my hope the Committee can rectify the situation for the benefit of the country.

THE VANCOUVER SUN

Bad news for Canada: U.S. could scrap new space telescope

Vancouver Sun
By Max Harrold, Postmedia News
July 7, 2011

One day before Atlantis was set to launch — marking the end of the storied space shuttle program — the Canadian government seemed caught off guard by a proposal in the U.S. Congress to kill a major new space telescope in which Canada is heavily invested.

CAPE CANAVERAL, Florida — One day before Atlantis was set to launch — marking the end of the storied space shuttle program — the Canadian government seemed caught off guard by a proposal in the U.S. Congress to kill a major new space telescope in which Canada is heavily invested.

But a senior official here on Thursday underscored how important the James Webb Space Telescope is to Canadian ambitions in space. Canada is also spending $150 million in it.

On Thursday, the U.S. House of Representatives' Appropriations Subcommittee on Commerce, Justice and Science approved a yearly budget for the National Aeronautics and Space Administration that does not include funding for the telescope, the successor to the Hubble Space Telescope, which has yielded a heap of amazing images and data.

Federal Industry Minister Christian Paradis, in Florida with his 10-year-old son to watch the shuttle's historic launch, seemed to have had no warning of the decision. It comes at a time when U.S. politicians are debating deep government budget cuts in a range of areas.

"I was just told about this," Paradis told reporters near the launch pad. "I will take the time to fully analyze what it is going on and check with the (Canadian Space Agency).

Standing nearby, Steve MacLean, president of the CSA and an astronaut who went on two space shuttle missions, said the Webb telescope is absolutely worth trying to save.

"I think the one thing that people in North America will remember from the astronomy program in a hundred years is what the Hubble Telescope has done so far and what the James Webb Telescope could do,"

Hopefully, the cash-strapped U.S. government will figure out a way to fly the Webb, he added. "It's that telescope and a few other things that we're doing on the ground that will teach us much about our future. Canada has a major role in this telescope.

We have a technology that is at the heart of the telescope that's involved in precisely pointing it."

The telescope is slated to launch in 2014 and use infrared technology to detect the first stars, quasars and supernovae of the early universe with unprecedented sensitivity. It is to be positioned 1.5 million kilometres from Earth.

The Webb telescope project has been criticized for being poorly managed and for a budget that reportedly ballooned to $6.5 billion U.S. from $1.6 billion U.S..

Minister of State for Science and Technology Gary Goodyear, who is also in Florida, downplayed the vote in Congress, calling it merely "a recommendation."

SCIENTIFIC AMERICAN™

Threat of James Webb Space Telescope cancellation rattles astronomy community

Scientific American
Thursday, July 7, 2011
By John Matson

As NASA prepares to wrap up its shuttle program, leaving open questions about what comes next for U.S. human spaceflight, the next big thing in NASA's astronomy program has been dealt a blow. The James Webb Space Telescope, a tennis court–size spacecraft that would take up a position in deep space to peer farther than ever into the cosmos, has been in development as a replacement for and successor to the Hubble Space Telescope, which has already logged 21 years in orbit. But the House Appropriations Committee, in a bill announced July 6, proposed axing the project entirely this week, citing mismanagement and bad budgeting.

The bill, which would cut $1.6 billion, or about 9 percent, from NASA's overall budget, would have to clear the full House and gain Senate approval before becoming law. But the specter of JWST cancellation looms large over a field already facing diminished resources. "Obviously, this proposal...is upsetting," American Astronomical Society (AAS) Executive Officer Kevin Marvel wrote on his organization's blog. "The astronomy community knows the value of the JWST, recognizes that nearly all technical hurdles have been overcome and that a review of the program's management, budget and completion plan is nearly complete."

The House committee's concerns have some grounds; in November 2010, a review convened by Sen. Barbara Mikulski (D–Md.) found JWST was well behind schedule and $1.4 billion over budget, bringing the total estimate for the observatory to $6.5 billion. (NASA has already spent roughly half that amount.) The telescope, which had been targeted for a 2014 launch, would launch no sooner than 2015, the report concluded. In recent months much later launch dates of 2018 or beyond have been rumored.

But delays and cost overruns are nothing new for projects of unprecedented scale. Take the launch of the Hubble Space Telescope, which is a much smaller observatory than JWST, orbiting far closer to Earth, and whose deployment was a much simpler affair than the elaborate de-cocooning JWST will have to perform in deep space. Hubble was famously delayed by seven years, from a 1983 launch to

a 1990 launch, and had just about tripled in cost by the time it reached orbit, according to a 1992 U.S. General Accounting Office (now the Government Accountability Office) report (pdf). By the time of that GAO report, the Hubble's price tag was roughly $3 billion in 2011 dollars. Its cost over the years has swelled to several times that amount, thanks to two decades of operations and five space shuttle visits to the telescope for servicing. (A single shuttle servicing mission costs about $2 billion, according to one NASA estimate.)

Who knows if Congress would have given a greenlight to Hubble if its total cost were known from the start? But few would argue now that the orbiting observatory has been a poor investment. In fact it has revolutionized humankind's view of the universe.

And who knows what would have happened if Congress had not canceled the Superconducting Super Collider (SSC)? The SSC, a mammoth particle physics experiment in Texas, was axed in 1993 when its price tag grew too large for Congressional funders' liking. Roughly $2 billion had already been sunk into the project by 1993, but its estimated cost had doubled from $5.3 billion to more than $11 billion. (That is about $17 billion in 2011 dollars.)

The SSC would have been the successor to the much less powerful Tevatron in Illinois, a workhorse particle collider that is scheduled to be shut down this year. Instead the title of most powerful collider moved to Europe, when the Large Hadron Collider (LHC) came online in late 2009 and quickly eclipsed the Tevatron by colliding particles at higher energies than had ever been achieved. But whereas the LHC is designed to be about seven times as powerful as the Tevatron, the SSC would have been 20 times as powerful as the Tevatron and nearly three times as powerful as the LHC.

VANITY FAIR

It's Like the House Appropriations Committee Subpanel Doesn't Even Think Deep Space Is That Cool

Vanity Fair
by *Juli Weiner*
July 7, 2011, 4:55 PM
Follow @juliweiner

*From Hubblesite.org.*The no-fun House Appropriations Committee science subpanel is ruining space for everyone. Earlier today, the group voted "to cut funding for the successor to the Hubble Space Telescope, calling the project 'billions of dollars over budget and plagued by poor management,'" *The Hill* reports. Such a budgetary trim still requires a go-ahead from the House and Senate Appropriations Committee.

For those unfamiliar with the objectives of the ill-fated Hubble successor, the James Webb Space Telescope, NASA's Web site is characteristically informative on the subject. The James Webb was designed to orbit a million miles above the Earth's surface to "find the first galaxies that formed in the early Universe, connecting the Big Bang to our own Milky Way Galaxy." Its ancestor, the Hubble, is responsible for this famous deep-space photograph (shown above), instantly recognizable to anyone who took Introduction to Astronomy sophomore year as a pass-fail quantitative-reasoning requirement.

That photograph, which looks like nothing more than wallpaper for a toddler's room, is actually "the deepest portrait of the visible universe ever achieved by humankind." Per the Hubble's Web site: "the million-second-long exposure reveals the first galaxies to emerge from the so-called 'dark ages,' the time shortly after the big bang when the first stars reheated the cold, dark universe." The James Webb photos could have been that much more incredible.

Is it within the budget for the House Appropriations Committee science subpanel to rent *Apollo 13* again and remember why they got into this business? (It's to revel in the unknowable majesty of space.)

stamford advocate.com

Mikulski calls Webb termination vote shortsighted

Thursday, July 7, 2011

WASHINGTON (AP) — Maryland Sen. Barbara Mikulski says a House subcommittee vote to end funding for the James Webb Telescope is shortsighted and will kill 2,000 jobs nationwide.

Mikulski says the vote Thursday by the House Appropriations subcommittee is misguided and will stall scientific progress and discovery. The telescope is planned as the successor to the aging Hubble Space Telescope run by the Baltimore-based Space Telescope Science Institute, but has been beset by cost overruns. NASA announced last year that the telescope's budget had ballooned from $3.5 billion to $5 billion.

The Baltimore Democrat urged the administration to fight for funding for the telescope, which she says will lead to the innovation and discovery that have made America great. Mikulski says the bill will now be considered by the appropriations committee on Wednesday.

Read more: http://www.stamfordadvocate.com/news/article/Mikulski-calls-Webb-termination-vote-shortsighted-1456682.php#ixzz1RkGLTFVV

THE HILL

Panel votes to scuttle space telescope

The Hill
By Gautham Nagesh - 07/07/11 02:58 PM ET

The House Appropriations Committee Science subpanel voted Thursday to cut funding for the successor to the Hubble Space Telescope, calling the project "billions of dollars over budget and plagued by poor management."

The decision to terminate funding for the James Webb Space Telescope, which would still need to garner approval from the full committee, House and Senate, is part of a $1.6 billion cut in NASA's funding approved by the subcommittee.

“This legislation includes funding for some of the most critical aspects of government — the protection of our people here at home, the competitiveness of our businesses and industries, and the scientific research that will help America continue to lead the world in innovation,” House Appropriations Chairman Hal Rogers (R-Ky.) said.

"However, given this time of fiscal crisis, it is also important that Congress make tough decisions to cut programs where necessary to give priority to programs with broad national reach that have the most benefit to the American people."

The Webb telescope was designed to look deeper into space than the Hubble, but its launch date has been pushed back repeatedly — to 2018 at the earliest. The move drew opposition from some Democrats, who have called it the latest blow to the nation's space program.

“Days before NASA embarks on its final space shuttle mission, we can ill-afford to jeopardize both the current and future leadership our country has in space exploration and observation," said Rep. Donna Edwards (D-Md.) in a statement voicing strong opposition to the cuts.

"The project is 75 percent complete and supports 2,000 jobs, including 500 in my state of Maryland. While there is reasonable cause for concern regarding NASA’s management of the project, eliminating this important and ambitious project is truly short-sighted," she said.

Edwards said she worries about the message sent to students by cutting projects aimed at advancing research and technology.

NASA has been the target of frequent cuts in recent years, as the Obama administration has looked to boost the commercial space industry. The president addressed the future of NASA after the retirement of the space shuttle program this year during Wednesday's Twitter town hall.

"Frankly, I have been pushing NASA to revamp its vision. The shuttle did some extraordinary work in low-orbit experiments, the International Space Station, moving cargo," Obama said.

"But now what we need is that next technological breakthrough. We're still using the same models for space travel that we used with the Apollo program 30, 40 years ago," Obama said.

The president said NASA is currently redefining its mission by investing in basic research with the ultimate goal of reaching Mars. He said the private sector could handle the more routine lower-orbit space travel.

JWST Backed by NASA Amid Call to Scrap Telescope Mission

BBC News
7 July 2011
By Jonathan Amos BBC science correspondent, Kennedy Space Center

The James Webb Space Telescope remains central to Nasa's mission, deputy administrator Lori Garver says.

The agency chief was responding to moves in the House of Representatives to cull the troubled observatory, which is now $2bn over budget.

A House appropriations panel has put forward a bill that would clip Nasa's 2012 budget and end JWST funding.

But Garver told BBC News: "James Webb is obviously part of our future that we believe very strongly in."

She said the White House administration and the Nasa management would be working with the House and the Senate to produce a budget that would enable the agency to fulfil its science and exploration objectives. "The process is not over," she added.

Ms Garver was speaking here at the Kennedy Space Center in Florida where Nasa is preparing to launch its last ever shuttle mission.

The JWST is supposed to be the next great undertaking in space astronomy.

The telescope would have the biggest mirror ever sent into orbit and incorporate detectors capable of seeing the very first galaxies to form in the Universe.

But getting it ready for flight has proved to be a major technological challenge.

Uncertain timescale

One recent assessment suggested JWST's total cost had ballooned from $3.5bn to $5bn, and that continued delays could inflate the final bill well beyond $6bn.

In parallel with the price escalation, the probable launch date has slipped deeper and deeper into the decade with some commentators wondering whether JWST might not even be ready to fly this side of 2020.

It is against this background that the House Appropriations Committee has drawn up it Fiscal Year 2012 Commerce, Justice, Science Appropriations bill.

It calls for a $16.8bn budget for Nasa, which is $1.6bn below last year's level and $1.9bn below what US President Barack Obama would like the agency to receive.

The panel would terminate funding for JWST if it had its way. But there is a long way to go in this story.

The Senate will have its view, and then Congress as a whole will have to come to a determination. Nasa itself is conducting its own internal review of the JWST project.

Ms Garver said she was hopeful that everyone could come to an agreement on the telescope's future.

"We absolutely do believe that we are working towards a budget that will deliver a James Webb telescope this decade. We are just now completing the bottoms up review of the cost to be able to get a funding profile to do just that."

JWST is not a US-only project; it has significant input from the Europeans and the Canadians.

Europe's contribution includes the launcher, an Ariane 5, to get the telescope into orbit. It is also leading the provision of two of the observatory's four instruments - MIRI and NIRSpec.

European Space Agency Director General Jean-Jacques Dordain was asked at the recent Paris Air Show about delays to the overall programme. He said Europe would continue working to its timeline and would not be distracted by the arguments over James Webb taking place in the US.

"We will be ready for a launch in 2016/17," he told BBC News.

"If the launch has to be later because Nasa doesn't have the financial wherewithal or the technical ability to go ahead in 2016/17 then we can put our instrumentation in storage pending a launch date. But I stress, we are not going to delay the delivery of our contribution because that would actually cost more, so we are going to finish our work as quickly as possible.

"Esa is not the bottleneck when it comes to the launch date," he added.

US Lawmakers Vote to Kill Hubble Successor

WASHINGTON — In a fresh blow to NASA's post-shuttle aspirations, key US lawmakers voted Thursday to kill off funding for the successor to the vastly successful space-gazing Hubble telescope.

The US House of Representatives Appropriations Subcommittee on Commerce, Justice, and Science approved by voice vote a yearly spending bill that includes no money for the James Webb Space Telescope (JWST).

The move -- spurred on by belt-tightening in cash-strapped Washington -- still requires the full committee's approval, the full House's approval, the Senate's approval, and ultimately President Barack Obama's signature.

But the relatively mild dissents in the committee, which said in a terse statement this week that the project "is billions of dollars over budget and plagued by poor management," suggests the JWST faces an uphill fight to survive.

The vote struck a blow at the National Aeronautics and Space Administration's goals with the space shuttle program about to end after 30 years, and Obama's decision to axe a new plan to return astronauts to the moon.

NASA plans to lay out a budget that "will allow us to launch the Webb telescope in this decade," deputy administrator Lori Garver told reporters at the Kennedy Space Center in Florida.

"We will be working with Congress to assure them we can manage this program and develop the most amazing space telescope," she said, calling the JWST "a perfect example of reviewing the unknown and reaching for new heights."

In February, NASA Inspector General Paul Martin told lawmakers the JWST had careened billions of dollars over budget.

Initial estimates put the cost of the telescope, designed to help the hunt for knowledge about early galaxies in the universe, at $1.6 billion, but now the total price tag has ballooned to $6.5 billion, he said.

NASA has repeatedly pushed back the telescope's launch date, now set for 2018 at the earliest.

The project, initially named the Next Generation Space Telescope, is designed to look deeper into space than the Hubble Telescope, and would also venture farther than the Earth-orbiting Hubble, launched in 1990.

Some Democrats on the panel voted against the bill, and lawmakers often wait until the full committee takes up legislation to offer amendments to protect cherished projects.

The vote came one day after Obama, in an unprecedented question and answer session with Twitter users, said NASA needs new technology breakthroughs to revitalize its mission to explore the universe.

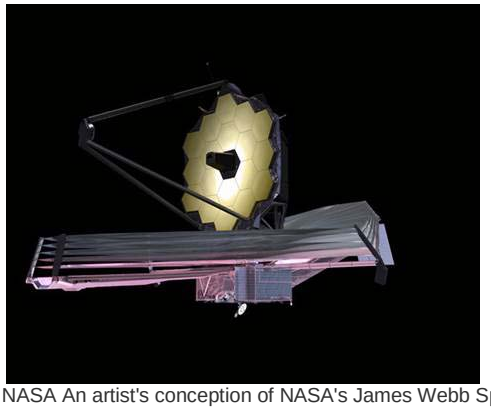
"We are still a leader in space exploration, but, frankly, I have been pushing NASA to revamp its vision," Obama said, as the shuttle Atlantis geared up for its final mission.

Obama, who axed NASA's Constellation program that would have sent astronauts back to the moon, said the United States should move beyond the space travel models it used in the Cold War-era race to the moon in the 1960s.

JWST is an international collaboration grouping NASA, the European Space Agency (ESA), and the Canadian Space Agency (CSA).

Space on msnbc.com

NASA chief tells Congress: Save Webb telescope



NASA An artist's conception of NASA's James Webb Space Telescope.

By Mike Wall

SPACE.com

07/13/11 updated 30 minutes ago

NASA chief Charlie Bolden went to bat for the agency's imperiled next-generation space telescope Tuesday, telling members of Congress that the instrument has greater potential for discovery than the iconic Hubble Space Telescope.

A proposed congressional budget bill announced last week would terminate NASA's James Webb Space Telescope (JWST), an ambitious instrument with a history of delays and cost overruns. But NASA can deliver JWST to space for about the same price as Hubble, Bolden said — and the science returns would be even greater.

"I have tried to explain what I think is the importance of James Webb, in terms of opening new horizons far greater than we got from Hubble," Bolden told members of the House Science, Space and Technology Committee Tuesday. "I would only say that for about the same cost as Hubble in real-year dollars, we'll bring James Webb into operation."

A rocky history

The $6.5 billion JWST, named after a former NASA administrator, is billed as the agency's muscular successor to Hubble, which launched back in 1990 and is still

going strong. JWST is an infrared observatory designed to peer further back into the universe's early days than ever before.

While many researchers have enthusiastically touted the telescope's potential, its development has been plagued by problems. Last November, an independent review panel found that JWST will cost at least $6.5 billion and could launch no earlier than September 2015, putting it $1.5 billion over budget and more than a year behind schedule.

The telescope's issues are primarily the result of poor management practices, the panel further concluded.

A recent budget and technology plan painted an even more pessimistic picture, estimating that JWST could launch by 2018 at the earliest.

And last week, the telescope's future came into even more serious question. The House Appropriations subcommittee that oversees NASA proposed a 2012 spending bill that would give the space agency just $16.8 billion, $1.6 billion less than last year. JWST's funding would be pulled completely.

Fighting for JWST

Bolden came to Capitol Hill on Tuesday to discuss NASA's plans for its next heavy-lift rocket system — specifically, to explain to an increasingly impatient Congress why the agency has yet to decide upon a design. But he also fielded questions about JWST's fate and made a case for the instrument's continued funding.

For example, Bolden stressed that NASA has made changes to JWST's management, and that the instrument is already quite far along in development. More than 75 percent of the telescope's hardware has already been delivered, Bolden said.

The NASA chief also stressed JWST's potential to revolutionize our understanding of the universe, invoking Hubble's great achievements as an example of what such powerful telescopes can do.

"When we started Hubble, dark energy didn't exist. At least, we didn't know about it," Bolden said. "When we launched Hubble, there was no such thing as extrasolar

planets. So those kinds of discoveries would probably go lacking, unless some other nation stepped forward and did it."

redOrbit

James Webb Telescope Funding In Danger

Posted on: Monday, 11 July 2011, 07:25 CDT

The US House of Representatives is moving forward with a proposal that would eliminate funding for the James Webb Space Telescope (JWST)--said to be one of the most complex projects of its kind ever conceived--according to various media reports.

According to a July 8 article by Matt Peckham of Time's Techland, the move to strike NASA's Hubble Telescope successor is "an attempt to further tighten the national belt." However, it threatens the billion dollar device currently planned to replace NASA's existing space telescope once its mission ends sometime in the year 2014.

The JWST was originally scheduled to launch around that same time, but it has since been delayed until 2016, claims Guardian Science Editor Robin McKie. Peckham, on the other hand, claims that delay is actually longer and will last until 2018.

Furthermore, the estimated cost of the next-gen space telescope "soared from an initial estimate of $1.6B to more than $6.5B," McKie said, noting that the journal nature dubbed the observatory "the telescope that ate astronomy" because of the constant delays and budget increases.

As a result of those delays and estimated price hikes, McKie reports that the House appropriations committee on commerce, justice, and science moved to effectively cancel the project by cutting nearly $2 billion from the US aeronautics administration's 2012 budget.

The budget cut must be approved by the full committee, as well as both the House and the Senate, before going into effect. However, "analysts say the telescope now faces a struggle to survive," the Guardian reports.

"What's the big deal about yanking a space telescope?" Peckham asks. "For starters, the Webb Telescope's actually more than your average collection of curved mirrors and lenses. In fact it's a full-blown infrared space observatory. Its mission: to scan for light from the very first stars, understand galaxy formation and evolution and study the origins of life in terms of planetary systems."

"Not surprisingly, the move to scrap the telescope, which has been under construction since 2004 and is named after a former NASA administrator, has horrified astronomers," said McKie. "The James Webb was intended to be the

centerpiece of astronomical research for the next two decades.

Its segmented mirror would be almost three times the diameter of the Hubble telescope's, and because it would orbit outside Earth's atmosphere it would be able to make observations of unprecedented accuracy. This would allow it to capture images from a time when the first stars and galaxies lit up the universe."

However, Hank Campbell of Science 2.0 argues that Congress might be making the right move in terminating the project, asserting that the telescope's "benefit and time to completion were overestimated and its funding requirement underestimated."

Campbell says that the idea behind the James Webb telescope is "a great one," but that the device itself has become "a black hole for funding… It may be that canceling the JWST will be the wake-up call NASA has needed for a long time."

the business of photonics
optics.org

Billion-pixel sensor to map universe in 3D is built

11 Jul 2011

As uncertainty surrounds the future of NASA's James Webb Space Telescope, a 106-CCD, meter-long space camera is assembled in France.

Technicians at Astrium France in Toulouse have finished assembling and aligning more than 100 CCDs that will form the eyes of "Gaia" - the largest digital space camera ever built, and due to start producing a 3D map of the universe after its launch in 2013.

The mosaic of detectors, arranged in seven rows of 16 CCDs in the main array, plus four more that will provide image quality control, were produced by the UK firm e2v Technologies. Each of the detectors measures 4.7 x 6 cm, and the total size of the array is a remarkable one meter long by 50 cm wide. Each of e2v's back-illuminated CCDs provides a 4500 by 1966 array of pixels, meaning that the entire assembly represents a 937 megapixel camera.

Philippe Garé, Gaia payload manager at the European Space Agency (ESA), says that the assembly step just completed is one of the most important in the development of the camera: "The mounting and precise alignment of the 106 CCDs is a key step in the assembly of the flight model focal plane assembly," he said.

Astrium's technical staff took one month to fit the detector mosaic together, reportedly completing the task on June 1 after working double shifts throughout May to add four CCDs per day on average.

But in a week when their confidence may have been dented by news that the James Webb Space Telescope (JWST) is facing an uphill battle to be completed after running over both time and budget, the result of all the painstaking work on Gaia should be a spectacular one for astronomers.

Delayed launch

Gaia had originally been scheduled for launch this year, and once it is in space it is expected to map an unprecedented amount of the night sky. Over the course of a five-year mission, ESA is hoping to map one billion stars across both the Milky Way galaxy and our more distant cosmic neighbors.

To obtain stereo views of those stars and generate a three-dimensional stellar map, the optical payload comprises two telescopes. After launch, it will be deployed permanently in the shadow of the Earth, in the so-called "second Lagrangian point" where the forces of orbital motion and gravitational effects are

exactly in balance – providing a stable point in space 1.5 km from the surface of the Earth.

As well as providing a new map of the heavens, Gaia will be able to measure the color and intensity of each star, thanks to the six different optical instruments that will use the giant camera.

More than half of the CCD array - nine columns of seven detectors – will be used to measure star positions, but also on board are a blue and red photometer. Some of the CCDs have been optimized for enhanced sensitivity at either the blue or red end of the visible spectrum to provide more detailed spectral information.

In addition, Gaia's high-resolution radial velocity spectrometer will measure the velocity of objects in space, while wavefront sensors and basic angle monitoring instruments are also incorporated in the array.

Over the course of the five-year mission, each of the billion target stars will be monitored approximately 70 times, with Gaia's detectors looking for any slight changes in the position, brightness, and color of each star. ESA is also expecting the telescope to discover hundreds of thousands of as-yet-undiscovered stellar objects, including an anticipated 15,000 extra-solar planets and brown-dwarf stars.

Relativity test

Gaia will also be used to test Einstein's General Theory of Relativity to its limits, by measuring the impact of the sun's gravity on starlight to a precision of two parts per million.

Like Gaia, NASA's JWST – the successor to the wildly successful Hubble mission – is behind schedule. But JWST has also run over its initial budget to such an extent that the project is now threatened with cancellation. Although such a drastic outcome is not yet certain, legislation passed by the Republican-controlled House of Representatives in Washington, DC, last week contained several cuts to government spending and specified JWST as a major target.

In the Appropriations Committee's fiscal 2012 budget for the Commerce, Justice and Science departmental spending, $16.8 billion was earmarked for NASA - $1.6 billion less than FY 2011 and $1.9 billion below President Obama's request.

Aside from continuing the close-out of the Space Shuttle program, the committee agreed only $4.5 billion for NASA's science programs, while its bill singles out JWST for "termination", adding that the project is "billions of dollars over budget and plagued by poor management".