



THE ARMSTRONG X-PRESS

Volume 61 Number 2 March 2019

NASA, center budgets solid

Bridenstine mentions X-57, X-59 in opening remarks

By Jay Levine
X-Press editor

The Trump Administration's proposed 2020 NASA budget was released March 11 and it's good news for the agency and for Armstrong.

"At \$21 billion, this budget represents a nearly 6 percent increase over last year's request and comes at a time of constrained resources across the federal government," said NASA Administrator Jim Bridenstine. "It also is a huge vote of confidence for all of the agency's hard work and dedication."

"We will go to the Moon with innovative new technologies and systems to explore more locations across the lunar surface than ever before," he said. "This time, when we go to the Moon, we will stay. We will use what we learn as we move forward to the Moon to take the next giant leap – sending astronauts to Mars."

NASA also will continue ushering in a new era of human spaceflight as American astronauts are launched on American rockets from American soil for the first time since 2011. The Space Launch System, Orion spacecraft, and Gateway will continue to be the base for deep space exploration.

Additional goals include NASA studying the Earth and the Sun, revealing the unknown with missions to Jupiter's moon Europa



AFRC2019-0047-16

NASA/Lauren Hughes

Armstrong Deputy Director Patrick Stoliker discusses the center's proposed budget.

and the launch of the James Webb Space Telescope. Planning and developing the first round-trip mission to Mars with a sample return also is under way.

Closer to Earth, the Aeronautics proposed budget is \$667 million, up more than \$31 million. Included is funding for the X-57 distributed electric propulsion aircraft and construction of the experimental supersonic X-59 aircraft. The budget also accelerates research in urban air mobility and completes technology demonstrations to integrate larger UAS into the NAS.

In fact, Bridenstine began his presentation with mentions of the agency's two new X-planes

pushing technology and regulatory boundaries. The X-59 could lead to commercial supersonic travel, currently prohibited by law, that could greatly reduce travel times for coast-to-coast travel, while the X-57 could reduce noise, emissions and regional travel costs to open new economic possibilities.

Armstrong's proposed 2020 budget is \$293.7 million, which is up from last year overall, and employment and the center's core work are stable, said Patrick Stoliker, Armstrong deputy director.

Of the proposed \$293.7 million Armstrong budget, Aeronautics, Science and Safety, Security and Mission Services comprise the

biggest portions: \$129.8 million, \$62.6 million and \$69 million, respectively. Rounding out the budget are \$3.9 million for Exploration Technology, \$0.8 million for Deep Space Exploration Systems, \$0.2 million for Low Earth Orbit and Spaceflight Operations and \$27.4 million for Construction and Environmental Compliance and Restoration.

The Science funding supports extended operations for the airborne Stratospheric Observatory for Infrared Astronomy (SOFIA), a partnership with the German Aerospace Center. Armstrong operates the airborne astronomical observatory that is capable of observing a wide variety of astronomical objects and phenomena.

The Science budget also supports center Airborne Science platforms that are set to support the Earth Venture Suborbitals-3 mission. Armstrong operates a fleet of scientific aircraft supporting remote sensing observations for Earth science.

Deep Space Exploration Systems include the Ascent Abort-2 Flight Test in 2019 and Exploration Technology funding is stable. That area includes Armstrong's role as the Level 2 Program Office for the Flight

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Air shows return in 2020

First the good news: there will be two air shows in the Antelope Valley in 2020. Now the bad news: no air shows in 2019.

The Los Angeles County Air Show (LACAS) Board of Directors and Edwards Air Force Base senior leadership are working to complete a multi-year partnership to have air shows within the Aerospace Valley. The partnership includes resuming air shows at Edwards Air Force Base in 2020, which have not occurred since 2009.

The October 2019 air show dates for the LACAS Gen. William J. Fox Air Field in Lancaster moved to March 2020 to accommodate the schedule of the U.S. Navy Blue Angels flight demonstration team. An air show is set for Edwards Air Force Base in October 2020 featuring the U.S. Air Force Thunderbirds.

“The Blue Angels communicated their desire to kick off their 2020 season at the LACAS at Fox Field in Lancaster,” said Mike VanKirk, LACAS president. “After careful consideration, the LACAS board of directors agreed that accommodating the Blue Angels schedule is in the best interest of our air show, our fans and our key



AFRC2018-0056-062

NASA/Ken Ulbrich

Armstrong pilots Stu Broce, Greg Nelson and Tim Williams sign autographs at the 2018 Los Angeles County Air Show at the Gen. William J. Fox Airfield.

stakeholders.”

The air show dates for 2020 are:

- March 21-22, 2020, at Fox Airfield, Lancaster, featuring the U.S. Navy Blue Angels
- Oct. 10-11, 2020, at Edwards Air Force Base featuring the U.S. Air Force Thunderbirds.

The future plan is to rotate bi-annual shows starting in 2021 with the following preliminary dates:

- Oct. 15-17, 2021 at Fox Airfield, Lancaster.

- Oct. 14-16, 2022 at Edwards Air Force Base

“Team Edwards is very excited to move forward with our LACAS partners to bring an air show back to Edwards Air Force Base – the center of the aerospace testing universe,” said Brig. Gen. E. John Teichert, 412th Test Wing commander.

“Our partnership will establish a one-of-a-kind, world-class Aerospace Valley Air Show that

will showcase this amazing location as the primary place on the planet for aerospace expertise, innovation and partnerships,” Teichert said. “It will also provide an incredible opportunity to inspire, encourage and educate adults and children alike while demonstrating what we at Edwards provide to the warfighter. We are proud to be a key part of the Aerospace Valley and to work with the superb team at the LACAS.”

Los Angeles County Air Show Inc. will host key community events this year, including a large interactive Aerospace Valley STEM exhibition at the Antelope Valley Fair Aug. 16-25.

“Our commitment to inspire and connect our local youth to STEM has not wavered,” said VanKirk. “In 2019, along with many of our air show partners, we will host an impressive, interactive Aerospace Valley STEM event that is second to none at this year’s Antelope Valley Fair. This will be a great way to engage both young and seasoned air show fans. Having the opportunity to have an impressive footprint at an iconic event like the AV Fair is invaluable to raise awareness for our future shows.”

Super Guppy visits for its maintenance

By **Kate Squires**

Armstrong Public Affairs

NASA’s B-377SGT Super Guppy Turbine cargo aircraft, operated by NASA’s Johnson Space Center, arrived at Armstrong’s Building 703 in Palmdale, April 1 to continue its phase maintenance period requiring hangar support. The whale-like aircraft transports oversized parts, such as International Space Station modules, Orion heat shields, Orion crew modules, the Space Launch System Service Module Adapter, and other oversized aerospace hardware across the U.S. for the agency.

Phase maintenance checks are periodic inspections that have to be performed on all commercial and civil aircraft after a certain amount of time or usage. While the Super Guppy normally undergoes such maintenance at Ellington Field near the Johnson Space Flight Center facilities in Houston and the El Paso Forward Operating Location at El Paso International



AFRC2019-0062-01

NASA/Ken Ulbrich

NASA’s Super Guppy aircraft arrives for maintenance at Building 703.

News at NASA

ISS research looking at Parkinson's

Parkinson's disease affects more than 5 million people on Earth. Research on the International Space Station could provide insight into this chronic neurodegenerative disease and help scientists find ways to treat and prevent it.

The investigation, Crystallization of LRRK2 Under Microgravity Conditions-2 (CASIS PCG 16), grows protein crystals of Leucine-rich repeat kinase 2 (LRRK2) on the space station. A kinase is an enzyme that adds phosphate groups to other molecules as part of the body's metabolic processes. People with Parkinson's disease experience increased function of LRRK2, and genetic studies link mutations in the LRRK2 gene to an increased risk of developing Parkinson's disease. Medications that inhibit LRRK2 are in development, but without knowing the precise structure of this enzyme, such work is like making a key without knowing the shape of the keyhole it must fit.

Growing LRRK2 crystals on Earth is difficult and does not produce samples with high enough quality for researchers to determine the protein's shape and structure – the keyhole. Protein crystals grow larger and more uniformly in space, though. Scientists can analyze the larger space-grown crystals to get a better idea of how the disease works and develop drugs – or keys – that target the condition more effectively and with fewer side effects.

This space station research may bring those working to treat and prevent Parkinson's disease one step closer to finding the right key.



NASA/David C. Bowman

DAWN readied for DC-8 mission

Electronics technician Anna Noe makes final checks to the Doppler Aerosol Wind Lidar (DAWN) before it begins a cross-country road trip for use in an upcoming airborne science campaign. Noe is pictured here from the underside of the instrument looking through the exit optical window. Developed at NASA's Langley Research Center in Virginia, DAWN uses laser pulses to take highly accurate measurements of vector wind speed and direction. In the upcoming campaign, which will be based from Armstrong, scientists will use DAWN to validate measurements from Atmospheric Dynamics Mission Aeolus (ADM-Aeolus), a European Space Agency satellite that profiles wind speeds across the globe. ADM-Aeolus launched in August 2018. Researchers believe data from the satellite will help improve the accuracy of weather forecasts. Validation flights aboard the Armstrong DC-8 flying laboratory are scheduled to begin April 15. Langley scientist Michael Kavaya is the principal investigator for DAWN. Langley atmospheric scientist Kristopher Bedka is the mission lead for the flight campaign.

Super Guppy... from page 2

Airport, those facilities did not have large enough hangar space available, bringing the Super Guppy to the Antelope Valley.

The aircraft has made previous visits to Armstrong and Building 703 for a landing gear change and other routine maintenance checks. Although Armstrong has expertise in maintaining its own fleet of aircraft, the center is only providing a "home away from home" for the Super Guppy's own maintenance team to perform all of the necessary checks and work on this one-of-a-kind aircraft.



AFRC2019-0062-03

NASA/Ken Ulbrich

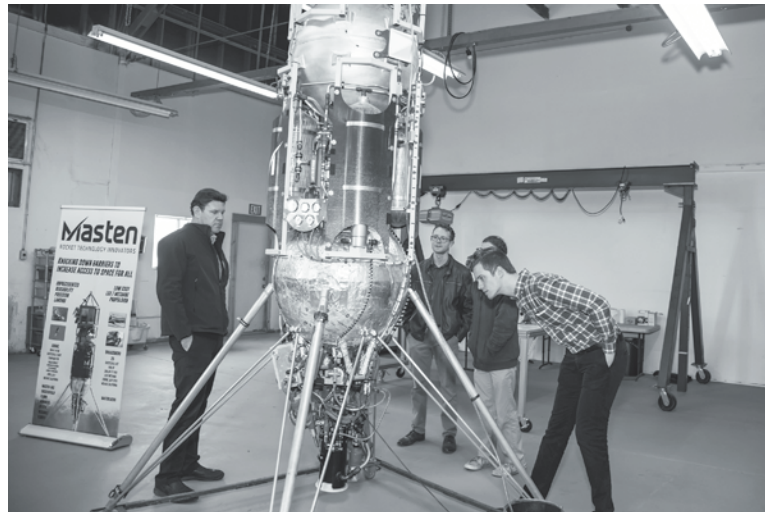
This Super Guppy side view shows how it can carry such large payloads.



AFRC2019-0047-7

NASA/Lauren Hughes

Christian Gelzer, Armstrong chief historian, discusses some previous center projects now in the U.S. Air Force Museum on Edwards Air Force Base.



AFRC2019-0047-32

NASA/Lauren Hughes

Media and social media representatives attending a budget event at Armstrong also toured Flight Opportunities program's partner Masten Space Systems.

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Opportunities program. The center also provides technical oversight for Small Business Innovation Research and Small Business Technology Transfer.

Deep Space Exploration Systems and Low Earth Spaceflight operations includes work on the Space Launch System and the Orion crew vehicle, support of the International Space Station and Mission

Operations and Crew Program Management.

The Construction and Environmental Compliance and Restoration budget includes \$9.7 million for repairs and improvements to renew and sustain tests facilities including capital repairs and improvements to NASA infrastructure and cleans up pollutants released

into the environment from past activities. Also included are minor revitalization and construction projects that include repair of the fire suppression system.

A NASA Social was hosted at each of the centers following Bridenstine's presentation.

Media and social media representatives saw the Lunar Landing Research Vehicle, a

major contribution of the center to the vehicle that first landed on the Moon, watched the budget briefing, were welcomed by Stoliker, learned about Flight Opportunities, saw some of the aircraft used in research, observed the control room and headed to the Mojave Air & Space Port to learn about NASA partners Masten Space Systems and Virgin Galactic.

Noffz, Flight Opportunities program chief engineer, dies

Greg Noffz, Armstrong Flight Opportunities program chief engineer, died March 22. He was 53.

He began at the center as a student intern more than three decades ago and became an experienced thermal dynamics measurement test engineer. He was very focused on the

accurate measurement of thermal dynamics and was sought after for his expertise. Noffz's diligence is said to have saved the government resources by identifying potential project overlap.

One of the experiments he was involved in was the Pegasus

Hypersonic Experiment. The project involved a "glove" attached to a Pegasus rocket booster and flown underwing of an L-1011 aircraft from the Kennedy Space Center in 1998. The hypersonic experiment provided information about heat transfer, temperature

and pressure measurements at high speeds and altitudes. Another part of the mission was to launch a small satellite into space

People who knew Noffz said he enjoyed the outdoors, was intelligent, a perceptive and creative engineer and detail oriented.

The X-Press is published the first Friday of each month for civil servants, contractors and retirees of the NASA Armstrong Flight Research Center.

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