National Aeronautics and Space Administration

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Boom! Boom!

Columbia landing 40 years ago ushered in new era

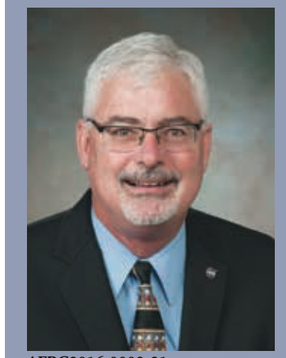
NASA

The distinctive double sonic boom on April 14, 1981 indicated that Space Shuttle Columbia was headed to its planned landing on the dirt runway on Rogers Dry Lake, which is adjacent to NASA Armstrong (then Dryden). An estimated crowd of 320,000 people, including a graduate student who now is Armstrong's Deputy Director Pat Stoliker, were there to greet shuttle commander John Young and pilot Robert Crippen. Young and Crippen had completed the Space Shuttle Program's first mission to space. *See story, page 2.*

www.nasa.gov/

Witnessing history

Deputy director was graduate student then



AFRC2016-0002-21
NASA/Ken Ulbrich

NASA Armstrong Deputy Director Pat Stoliker was a graduate student when he witnessed Space Shuttle Columbia's landing on April 14, 1981.

S81-30734 NASA

Space Shuttle Columbia landed on Runway 23 on April 14, 1981 to conclude the first shuttle mission to space. The orbiter landed on Rogers Dry Lake, which is adjacent to NASA Armstrong (then Dryden).

By Jay Levine
X-Press editor

Patrick Stoliker began to scan the sky as he heard the loud double boom. He and about 320,000 spectators knew that sound signaled the re-entry and soon landing of Space Shuttle Columbia on a dirt runway on Rogers Dry Lake, adjacent to NASA Armstrong (then Dryden).

Shuttle commander John Young and pilot Robert Crippen completed the 54-hour first space shuttle mission, which is considered one of the boldest test flights in history and which ushered in a new era in human space flight.

April 14 marked 40 years since that milestone happened, but in many ways some details are as vivid as if it was that clear, calm day. Stoliker, who was a 25-year old graduate student in 1981 at the University of Southern California, Los Angeles, now is the deputy director at Armstrong.

He and some friends drove from USC north to Lancaster, where his family lived, when Columbia was set to land. Stoliker's father, Fred, was technical director at the Air Force Flight Test Center (now known as the Air Force Test Center) and had passes to the shuttle landing.

The family motor home departed early the morning of Columbia's landing for the air force base main gate with Stoliker, his family and his friends. In addition to a wide open view of the skies where they were parked by the rock formations on Rosemond Boulevard, Stoliker said he also could see the mass of people who came in cars, trucks, motor homes and buses to be a part of history.

"Seeing the mass of cars helped put it in perspective that this was a historical moment," Stoliker said.

"Following the double boom people scanned the skies for the orbiter and watched as it landed," he recalled. "Columbia rolled to a stop and the Star-Spangled Banner began to play on the loud speakers. It was a very patriotic moment."

There were many highlights that day, but there is one that

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NASA/Ken Ulbrich

The NASA Armstrong Unmanned Aircraft Systems Integration in the National Airspace System project team was honored with the 2020 Aeronautics Research Mission Directorate Associate Administrator Award in the category of Technology and Innovation (Group). In the above image, the Flight Test 6 team is seen prior to the pandemic by the aircraft used in that effort. The aircraft include from center clockwise, the TigerShark, the T-34C, The Beechcraft Beech 200 Super King Air aircraft and the TG-14.

Team recognized

UAS Integration into the NAS project earns award for groundbreaking work

The Unmanned Aircraft Systems Integration in the National Airspace System project team was honored with the 2020 Aeronautics Research Mission Directorate Associate Administrator Award in the category of Technology and Innovation (group).

"As we strive to make aviation more sustainable and enable new forms of air travel for all, your group's contributions toward achieving our research goals during the past fiscal year stood out among your peers across the nation," ARMD AA Robert Pearce said. "You and your team more than deserve this special recognition."

The team was honored for its completion of two partner-inspired Unmanned Aircraft Systems (UAS) demonstrations in fiscal year 2020, along with capturing certification lessons learned. In addition, the project delivered data research and inputs that resulted in updates to operational performance standards for mid-size UAS Detect and Avoid and Command and Control functions.

These accomplishments will pave the way for future UAS operators to successfully complete the FAA certification process to obtain permission to operate their vehicles. The UAS-NASA project has helped open the door for industry to bring mid-size UAS for FAA certification.

News at NASA

Helicopter makes first Mars flight

By D.C. Agle
NASA's Jet Propulsion Laboratory

NASA's Ingenuity Mars Helicopter became the first aircraft in history to make a powered, controlled flight on another planet April 19. The Ingenuity team at the agency's Jet Propulsion Laboratory in Southern California confirmed the flight succeeded after receiving data from the helicopter via NASA's Perseverance Mars rover.

"Ingenuity is the latest in a long and storied tradition of NASA projects achieving a space exploration goal once thought impossible," said acting NASA Administrator Steve Jurczyk. "The X-15 was a pathfinder for the space shuttle. Mars Pathfinder and its Sojourner rover did the same for three generations of Mars rovers. We don't know exactly where Ingenuity will lead us, but today's results indicate the sky – at least on Mars – may not be the limit."

Altimeter data for the solar-powered helicopter indicate Ingenuity climbed to its prescribed maximum altitude of 10 feet (3 meters) and maintained a stable hover for 30 seconds. It then descended, touching back down on the surface of Mars after logging a total of 39.1 seconds of flight. Additional details on the test are expected in upcoming downlinks.

Ingenuity's initial flight demonstration was autonomous – piloted by onboard guidance, navigation, and control systems running algorithms developed by the team at JPL. Because data must be sent to and returned from the Red Planet over hundreds of millions of miles using orbiting satellites and NASA's Deep Space Network, Ingenuity cannot be flown with a joystick, and its flight was not observable from Earth in real time.

NASA Associate Administrator for Science Thomas Zurbuchen announced the Martian airfield will be called Wright Brothers Field, in recognition of the ingenuity and innovation that continue to

Mars helicopter page 8

Rising to the challenge

By Jay Levine
X-Press editor

NASA Armstrong moved to required telework in March 2020. No one anticipated the dramatic changes to how people worked, how major work could be accomplished, or that a year later the worldwide pandemic would continue to influence daily life.

As the anniversary date approached, NASA Armstrong staff discussed at a town hall how they have responded, the challenges, and how the center continues to work on major milestones.

March 13 was the last full day on center for most people. Armstrong Center Director David McBride remembers it well.

"I was driving to visit my mother when I found out we had COVID-19 positive people at the center," he said. "I had to make a U-turn because there was a risk of exposing her to the pandemic and I have not seen her since."

Hope is on the horizon.

"She just received her second vaccine shot," McBride added. "In a couple of weeks, I should be able to go see her."

The morning before the town hall multiple people tested positive for COVID-19 on campus, which led center officials to decide to error on the side of caution and close a building and get everyone tested.

"Don't let your guard down," McBride said. "The situation shows why COVID-19 is still a danger to us. We still need masks and to socially distance and get the vaccine when you can."

NASA

A town hall panel talked March 13 about how the center has continued to make progress on major projects during the pandemic and learned to live in the very different work environment. Top left clockwise are Megan Person, Jennifer Cole, David McBride, Kassidy McLaughlin, Jerry Dobbins, Russell Leonardo and Kevin Rohrer.

AFRC2020-006331 NASA/Lauren Hughes

The Flight Operations Office at NASA Armstrong was able to gain agency approved to use its G-III (pictured) and C-20 aircraft at Armstrong for transport of mission-critical JPL staff from California to Florida.

AFRC2021-0040-018 NASA/Lauren Hughes

NASA's all-electric X-57 Maxwell aircraft under goes high-voltage ground testing at NASA Armstrong. A goal of the X-57 project is to help the Federal Aviation Administration set certification standards for emerging electric aircraft markets.

NASA/Bill Werner

Early in the pandemic NASA Armstrong and all NASA centers were required to have most staff telework and for few but the most essential to be at the facilities.

AFRC2020-0058-032 NASA/Carla Thomas

NASA Armstrong engineer Mike Buttigieg works on an oxygen hood system prototype worn by Dr. Daniel Khodabakhsh from the Antelope Valley Hospital. The hood is designed to help coronavirus patients who don't yet need a ventilator, but who are experiencing breathing troubles. The hood forces oxygen into patients with mild coronavirus symptoms, minimizing the likelihood that the patient will need to use a ventilator.

As part of that vigilance, Dr. Dwight Peake, AFRC chief medical officer, offered some advice.

"We need to be persistent with our PPE (personal protective equipment) preventive practices and maintaining our space," he suggested. "The time will come in the next couple of months when we will all have a chance to get our vaccination. That is key to returning to something resembling normal."

Megan Person, Armstrong news chief, moderated the town hall discussion and Kevin Rohrer, Strategic Communications chief, read questions staff posted electronically during the event.

Panel members described empty parking lots and few people in the halls at the start of the pandemic and how center personnel adapted to work on key missions.

Kassidy McLaughlin, Armstrong instrumentation and integration engineer, has been working on NASA's Advanced Air Mobility National Campaign, which is working toward a new type of transportation system, and the X-57 electric aircraft.

"The past month or two has been pretty crazy with aircraft flying for the National Campaign and getting ready for the X-57 high-voltage testing," she said.

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Challenge... from page 5

"Making sure I shut off the computer at a reasonable hour has sometimes been difficult."

McLaughlin, who is early in her Armstrong career, said teleworking has disadvantages for new employees who can't just go down the hall and ask mentor a quick question. However, a lot of work can be accomplished remotely in a similar way to how works on center.

"A tech brief (which provides an aircraft project status) is different online, but a lot has happened to make it a seamless process," McLaughlin said "You feel like you are presenting as you would in a room. A lot has changed in the virtual environment to enable us to do a majority of work from home from the non-flight stage to the flight stage from home."

For staff members who have jobs that require hands on tasks on the aircraft, the challenges are many.

Jerry Dobbins, Armstrong SOFIA crew chief since 2014 and currently serving a detail as the deputy branch chief for Aircraft Maintenance, noted some of those challenges for the Stratospheric Observatory for Infrared Astronomy maintenance team.

"We have had some ups and downs and some of our colleagues have gotten sick," Dobbins said. "We've had to learn how to operate in a new environment, which has not been an easy adjustment. I am encouraged by the way we have adapted and we've learned to communicate in new ways. We have had a lot of opportunity to think outside the box."

Russell Leonardo, Armstrong deputy chief information officer and Information Technology Services branch chief, said the work/life balance was a challenge when the crisis initially started.

AFRC2020-102-35 NASA/Ken Ulbrich

Bolts are torqued on a Compact Fiber Optic Sensing System unit, also known as a FOSS rocket box, which was developed at NASA Armstrong. NASA research engineer Jonathan Lopez works on the unit that is a new variant of aircraft technology that researchers have advanced to withstand the harsh environments of a rocket launch and space travel.

"I was easily working more than 60 hours a week because my computer was six feet from where I was sitting, I could hear messages coming in and I couldn't go anywhere," he added. "Now I am trying to take a lunch, even if it's just on the patio."

Jennifer Cole, Aeronautics Projects office branch chief, works on management and technology development projects in the Aeronautics Research Mission Directorate. Helping project managers adjust was a focus at work. At home, having dueling meetings for her and her husband and school for their two children is challenging.

"There are distractions all day," she said. "I really have tried hard to carve out time just for our family and doing things to help us to connect. We have a lot going on any given time. I also feel for my school age kids who have not been able to play with other kids in a year."

The pandemic has brought center employees together even though everyone is dealing with challenges in different ways.

"Our project managers and teams are wonderful and remind me of family members that that I miss," Cole said. "I look forward to seeing everyone on center and hearing aircraft on the flight line and getting back to whatever that new normal looks like."

Immediately after most Armstrong staff were required to telework, it was noticeably different right away.

"I remember when I locked the door behind me at work," Russell said. "It was surreal to see the parking lot empty. I thought it would be a few weeks and that it would provide extra quiet time to get extra work done. I don't think anyone realized the seriousness of our new situation and how to adapt. A few more people are back on center now and it is a little less strange because I get to see some folks, but it is all at a distance."

Cole added that no one was aware of how long the telework guidance would remain.

"As a supervisor, I did not know how much to bring home," she said. "There were performance reviews and project plans. Faxing and the regular exchange of information also was a challenge. In fact, just to be in office when the flight line and office was empty felt like I was intruding, like I shouldn't be there."

All of the speakers focused on the center's amazing teams that have proved to be flexible and innovative. For example, Leonardo said his team is still repairing computers and about 20 people a week are able to receive help at Armstrong's Building 703 in Palmdale.

"We have changed the ways we do things in nearly every facet of IT for everyone to do their jobs," he said. "It is incredible to me how the team has managed to get the work accomplished."

While what people used to call normal will be different, McBride said, some changes, such as some of the staff telecommuting more frequently, will remain. Regarding getting back on Armstrong, he said the center has a plan, but is awaiting upcoming guidance from the Center for Disease Control and NASA Headquarters.

"We want to make sure we come back in a safe and effective way," he said.

In the meantime, McBride said staff members should try to balance the work-life equation.

"I am taking a week off and I encouraged others to do the same," he said. "Get away and disconnect."

NASA

NASA Space Shuttle astronauts John Young and Robert Crippen (in tan space suits) are greeted by members of the ground crew after stepping off the Space Shuttle Columbia after STS-1. The first shuttle mission from space ended with a landing on Rogers Dry Lake, which is adjacent to NASA Armstrong (then Dryden).

NASA

Columbia received a humorous sendoff before its ferry flight atop a modified NASA 747 back to NASA's Kennedy Space Center. From left are Melvin Burke, Armstrong (then Dryden) Orbital Flight Test (OFT) program manager, Armstrong Director Isaac 'Ike' Gillam, NASA 747 pilot Fitzhugh 'Fitz' Fulton, and Donald 'Deke' Slayton, NASA Johnson Space Center OFT project manager.

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stands out to Stoliker.

"I enjoyed sharing the day with my father," he said. "Dad had worked at Edwards since the early 1950s and he had seen a lot of history occur. I was raised on the accomplishments at the air force base and took them for granted. I remember seeing the Enterprise Approach and Landing Tests, but this was something above and beyond that."

After the landing, Stoliker, his family and friends, went back to Fred Stoliker's office and waited for the traffic to clear.

Stoliker had grown up with Mercury, Gemini and Apollo launches and, "it was right that the United States had a spacecraft again."

Stoliker's experience with the space shuttles began years earlier when he was a cooperative education engineering student at Philips Laboratories (now the Air Force Research Laboratory), which is just up the hill from Armstrong. While there, he was able to view three of the flights of the Space Shuttle Prototype Enterprise as it was released from the back of a NASA 747 to an unpowered landing on the lake bed in 1977.

NASA

An estimated 320,000 people waited on Rogers Dry Lake, which is adjacent to NASA Armstrong (then Dryden), for the Space Shuttle Columbia to land on April 14, 1981. The landing marked the end of the program's first mission to space and back and the beginning of a new era in space flight.

In 1992 Stoliker came to Armstrong as a senior aerospace engineer for PRC Inc. and became a government employee two years later assigned to the X-31A Enhanced Fighter Maneuverability project as the lead flight controls engineer.

"I always had tremendous pride in everything we do here," he said. "The projects we take on and the people who work on them make my day, every day."

One of those events can be seen on the main screen of Stoliker's cell phone. Big and bold is an image of the Space Shuttle Endeavour on the back of the NASA 747 Shuttle Carrier Aircraft during its final mission, which is detailed at https://www.nasa.gov/sites/default/files/files/10_05_12.pdf. The aircraft landed at Armstrong and departed the next morning for a final flight along the California coast and for a landing at Los Angeles International Airport. From there, it was towed through the streets of Los Angeles to the California Science Center, where it is on display.

Stoliker book-ended his shuttle experience with seeing Atlantis make the final space shuttle mission on July 8-21, 2011.

"That was special to me, being able to see the first landing and the final launch," he said.

See more about the center's contributions to the space shuttle program at https://www.nasa.gov/sites/default/files/files/09_11_Shuttle_Tribute.pdf

Mars helicopter... from page 3

propel exploration.

As one of NASA's technology demonstration projects, the 19.3-inch-tall (49-centimeter-tall) Ingenuity Mars Helicopter contains no science instruments inside its tissue-box-size fuselage. Instead, the 4-pound (1.8-kg) rotorcraft is intended to show whether future exploration of the Red Planet could include an aerial perspective.

This first flight was full of unknowns. The Red Planet has a significantly lower gravity – one-third that of Earth's – and an extremely thin atmosphere with only 1 percent the pressure at the surface compared to our planet. This means there are relatively few air molecules with which Ingenuity's two 4-foot-wide (1.2-meter-wide) rotor blades can interact to achieve flight. The helicopter contains unique components, as well as off-the-shelf-commercial parts – many from the smartphone industry – that were tested in deep space for the first time with this mission.

"The Mars Helicopter project has gone from 'blue sky' feasibility study to workable engineering concept to achieving the first flight on another world in a little over six years," said Michael Watkins, director of JPL. "That this project has achieved such a historic first is testimony to the innovation and doggedness of our team here at JPL, as well as at NASA's Langley and Ames Research Centers, and our industry partners. It's a shining example of the kind of technology push that thrives at JPL and fits well with NASA's exploration goals."

The helicopter team will receive and analyze all data and imagery from the test and formulate a plan for the second experimental test flight.

Fisher, former engineer, dies

David Fisher, a former long-time engineer at Armstrong (then Dryden), died March 12. He was 76.

Most of his career was at Armstrong as a research engineer. Fisher worked on a number of projects including the rocket-powered X-15, the XB-70 and the triple supersonic YF-12. He also worked on the F-15, the Jet Star, the F-18 High Alpha Research Vehicle, the F-16XL, forward swept wing X-29, and the highly maneuverable X-31. Fisher also published numerous articles on his research and was known for his boundary layer research.

Gaugler, former center lead, dies

Linda Gaugler, who worked at Armstrong (then Dryden) for decades, died Nov. 12, 2020. She was 68.

She came to the center in 1991 and served as lead mathematician for the Acquisition and Management Office. Gaugler retired in 2012.

Halasey, former engineer, dies

Robert Halasey, who retired in 1985 from NASA Armstrong (then Dryden) as an engineer and system analyst, died Jan. 17. He was 88.

Wells, former mathmatician, dies

Larry Wells, former mathmatician, died March 15. He was 88.

Wells began his 28-year career at NASA Armstrong (then Dryden) in 1961. He worked in the flight simulation lab and developed simulations for the X-15 and the Lunar Landing Research Vehicle.

Enevoldson, former pilot, dies at 88

Einar K. Enevoldson, a former research pilot at NASA Armstrong (then Dryden), died April 14. He was 88.

He worked at the center for 18 years and was involved in many research programs, including those with experimental wings, propulsion, and digital computer flight control systems.

The NASA aircraft he flew included the F-111, F-14, F-8 Digital Fly-By-Wire and F-8 Super Critical Wing. Enevoldson also piloted the triple supersonic YF-12A, the oblique wing AD-1, the Controlled Deep Stall Sailplane, the subscale F-15 remotely piloted spin research vehicle and the X-24B lifting body aircraft.

He was awarded a Distinguished Flying Cross and two NASA Exceptional Service Medals. In 1974 Enevoldson was awarded the NASA Exceptional Service Medal for his contributions as a NASA project pilot on the F-111 Supercritical Wing Program and on the F-15 Remotely Piloted Research Vehicle. In 1980 he was awarded the NASA Exceptional Service Medal for contributions as project pilot on F-14 stall and spin resistance tests.

In 2006, at the age of 74, Einar and his co-pilot set the sailplane altitude world record. The Perlan Project continues to carry forward his vision for high-altitude flight.

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