

Hills Headlines Mentoring Maximizing Event

by Gail Kellner
October 28, 2015

Dr. Malina Hills arrived at The Aerospace Corporation at age 27 with a willingness to accept new opportunities and a dedication to continuous learning. Armed with a Ph.D. in chemical engineering, she knew a lot about metals and gases and how they interacted on an atomic and molecular scale, but she didn't know a lot about space.

She explained her journey through many different jobs, starting off in the laboratories and into her current position as vice president of Space Program Operations, during "Maximizing Your Mentoring Experience," Tuesday, Oct. 27, in Titan IVB. Presented by the Corporate Mentoring Steering Committee, the event drew a diverse audience.

Hills dispelled the common myth that mentoring is typically a formal process. She pointed out that mentors are everywhere — they are your colleagues, your admins, your managers, and the people sitting right next to you, she emphasized.

"Mentoring is all about learning from people," she said. "It applies to technical, leadership, career, and life," she said. "If you are a good listener, people will enjoy teaching you. Stay curious, ask questions, and accept learning opportunities," she said.

Hills' career took many twists and turns from working in the labs, Project West Wing, Research and Program Development Office, to satellite program offices, just to name a few of her jobs.

She addressed mentoring in terms of technical mentoring and leadership and career skills.

"To gain knowledge and experience, there is a lot of informal technical mentoring that occurs when you collaborate with other people," Hills said. "For me in my early career, this was collaborating on research and working with other scientists and technicians. You can learn a lot about theory from other scientists, but if you want to know how equipment works, ask a technician," she said.

Hills shared that a retired vice president advised her that she had the opportunity to learn something from each person that she meets. She said that in applying the advice at Aerospace, she has learned that everyone is eager to share their technical knowledge if you approach them with genuine interest.

Her leadership skills were developed with a lot of informal mentoring from her management, and from internal and external contacts.

She also gained long-term, strong relationships more than 20 years ago that would never have happened if she hadn't had some interest in the Health Club and the Aerobics Club.

"Back then, I wouldn't have called it networking, but I met Chuck Gustafson and Willie Krenz at the Air Force gym. I met Randy Kendall running races."

She also joined the Aerospace Women's Committee and became president. She met many interesting women there, including Gwynne Shotwell, now president of SpaceX, who was her vice president at the time, and Dr. Wanda Austin.



After her talk, Dr. Malina Hills answered questions from the audience. (Photo: Elisa Haber)



"There is a lot of informal technical mentoring that occurs when you collaborate with other people."
(Photo: Elisa Haber)

Hills fielded an extended Q and A session with the audience, and in return she asked questions to those in attendance.

Her parting advice:

- Potential mentors are all around you; be respectful, respect confidentiality, start from a position of trust; have goals, be flexible and grab opportunities;
- Goal making is helpful; know thyself; analyze short term goals, be open to new opportunities, reflect, and ask for feedback;
- Networking is crucial to getting opportunities; deliver high-quality products so people will invite you to participate in new activities, both external and internal relationships are important.

To learn more about how to become a mentor/mentee, go to the [Aerospace Mentoring Initiative website](#).

Aerospace Establishes STEM Endowment Fund

October 21, 2015

Aerospace has a strong commitment to inspire future engineers and scientists. In support of that, the corporation has recently established the Aerospace STEM Endowment Fund to support science, technology, engineering, and math education.

"The goal of this fund is to support the next generation of students in their pursuit of academic and career paths in math and science – with an emphasis on underrepresented and underprivileged students," said Dr. Wanda Austin, Aerospace president and CEO. "It will allow us to raise funds through charitable donations that can be applied to scholarships, events, and other programs benefitting STEM students."



Aerospace employees have already shown their commitment to STEM by volunteering to run science fairs, mentors teams, give tours, visit classrooms, and more. Now, any Aerospace employee can donate to the Aerospace STEM Endowment Fund via payroll deduction.

The money will be used to support student scholarships and grants, schools with significant percentages of underrepresented and underprivileged students, teacher education programs, and other programs as the fund grows.

At present, donations can only be made through payroll deduction as part of the America's Charities Giving Campaign. In the future, employees will be able to make donations by check or credit card.

In recent years, the number of students in the United States studying the STEM disciplines has been steadily declining. Aerospace hopes to help reverse that trend.

"Here at Aerospace, we want to reach out and make a difference in our community, so that young students and professionals get the opportunities to succeed that they so greatly deserve," Austin said. "That's the purpose of The Aerospace Corporation STEM Endowment – to make a difference, one life, and one inspiring story at a time."

AeroCube-7 Ready for Duty as Atlas V Prepares for Launch

by Kimberly Locke
October 07, 2015

Riding on the coattails of its older siblings, AeroCubes 1 through 6, the first in the AeroCube-7 (AC-7) trilogy sits aboard an Atlas V at Vandenberg Air Force Base, California, awaiting its day in the sun. Launch is currently scheduled for Oct. 8, with the remaining two CubeSats in this series set for launch in spring 2016.

The AeroCube-7 trilogy, supported by the Space Technology Mission Directorate (STMD) at NASA headquarters in Washington, D.C., is designed to demonstrate two different capabilities — high-speed optical transmission of data, and small spacecraft proximity operations. NASA calls the overall mission the Optical Communications and Sensor Demonstration (OCSD) mission.

The first AC-7 flight is a pathfinder that will demonstrate most of the subsystems required for both OCSD missions and will be used to evaluate the performance of the attitude-control system. The pathfinder is also expected to demonstrate optical downlinking at speeds up to 100 megabits per second to a ground-based 30-cm telescope using an advanced attitude-control system and a moderate-power, tightly-focused laser beam.

"Much of the pathfinder's mission is to see how fast we can communicate to Earth from a CubeSat in low-Earth orbit," said Dr. Richard Welle, Microsatellite Systems Department, Space Materials Laboratory, Technology and Laboratory Operations (TLO), Engineering and Technology Group (ETG).

The second phase of the mission will address the need for low-cost sensors that small spacecraft can use to help them maneuver and operate safely while in close proximity to other spacecraft or objects in space. This will enable multiple small spacecraft to operate cooperatively during science or exploration missions, to approach another spacecraft or object for in-space observation or servicing, or to connect small spacecraft together to form larger systems or networks in space.

According to NASA, the Block II AC-7 satellites will be modified and upgraded as necessary to incorporate any lessons learned from the pathfinder mission and the laser communication system will be tuned to higher data rates provided they can be supported by the attitude-control system. Additionally, the Block-II satellites, flying together, will perform the proximity operations demonstration.

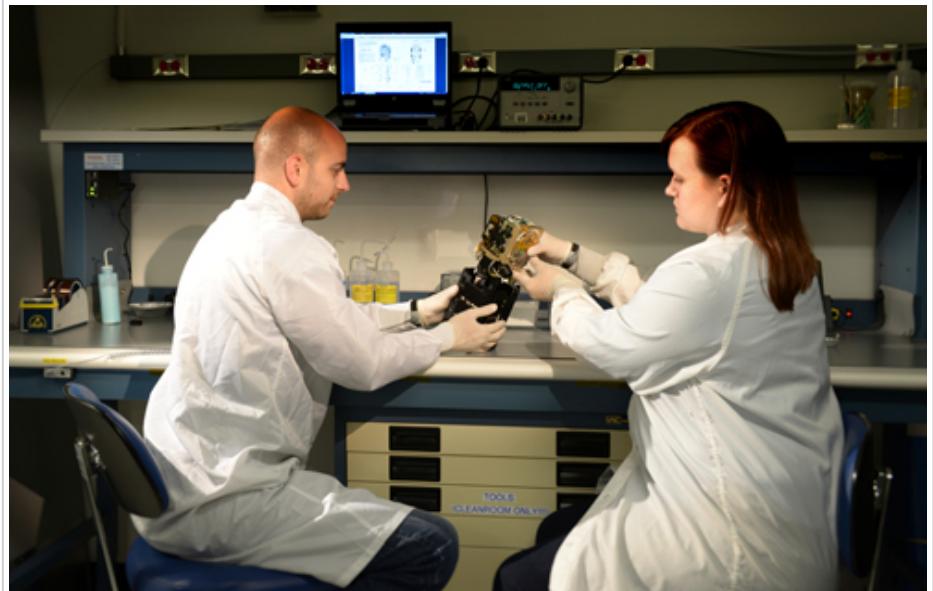
The mission is funded through NASA's Small Spacecraft Technology Program (SSTP) within STMD. SSTP was created, according to NASA, specifically to develop and demonstrate new technologies and capabilities for small spacecraft.

These tiny spacecraft, commonly referred to as CubeSats, are power challenged due to their small size. They can collect and store a relatively small amount of energy, an essential ingredient for performing many operations in space. This power challenge makes it difficult to meet the large power requirements typical of high-bandwidth data transmission systems.

Laser communication offers the potential for high-bandwidth communications at power levels well below comparable radio-frequency systems.

"These AeroCubes represent a continuing commitment to determining what can and cannot be done in such a small package," said Welle.

A CubeSat is a 10-centimeter (about 4 inches) on a side cube-shaped satellite that conforms to the CubeSat Standard developed by the California Polytechnic State University at San Luis Obispo. These small satellites are most often ejected into space from a Poly-Picosatellite Orbital Deployer (P-POD). The P-POD is the most widely used interface between CubeSats and launch vehicles, and its design is responsible for the iconic cubic shape.



Geoffrey Maul, left, and Jacqueline Tardif work on one of the AeroCube-7 triplets. (Photo: Eric Hamburg)

The common thread or tether, pardon the space pun, is that of technology testing and development. "These small satellites

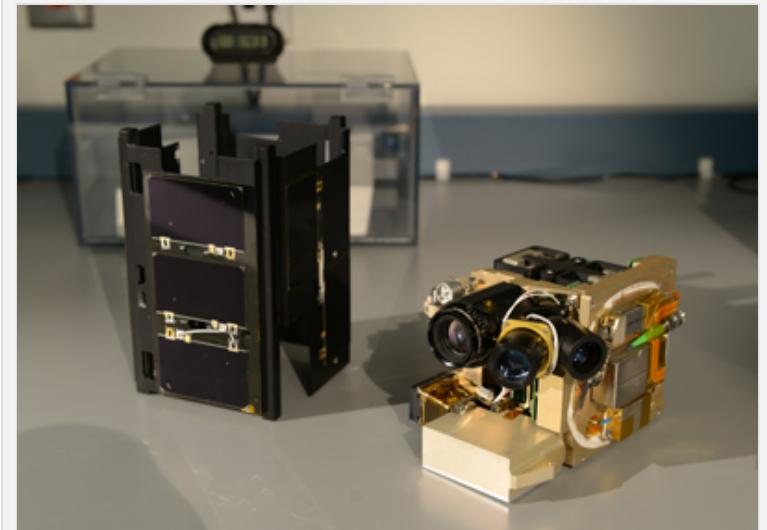
give us and others in the satellite business the opportunity to test power, attitude control, and communications features," explained Welle.

The small size and comparative simplicity of CubeSats encourages rapid development and testing, with a development cycle measured in months instead of the years typical of larger satellites. The entire satellite mechanical design can be incorporated in a single SOLIDWORKS model, which simplifies the design process while making it easier for the design team to identify any potential issues.

Geoffrey Maul, CAD design specialist in the Microsatellite Systems Department, has been the principal designer of several AeroCubes, and brought this experience to the AC-7 design.

"Flexibility is probably the biggest challenge when designing a CubeSat," said Maul. "When we start a CubeSat design we have to pick a starting point and sometimes that means making certain assumptions that prove to be wrong. It is my job to make sure the physical design can adapt to whatever changes are required when those assumptions change."

The challenge of flexibility is also a feature that allows CubeSat technology to evolve as fast as it has, ultimately leading to the very-high capacity communication system that will fly on AC-7, Welle added.



One of the AeroCube-7 triplets: The body is on the left, and the internal components are on the right. (Photo: Eric Hamburg)

Atlas V Lifts National Security Payload and AeroCube-7

October 08, 2015

In the early morning darkness, an Atlas V rocket lifted off from SLC-3E at Vandenberg Air Force Base carrying a national security satellite. The mission, which launched at 5:49 a.m. Oct. 8, also successfully deployed 13 CubeSats, including Aerospace's AeroCube-7, the Optical Communications and Sensor Demonstration mission for NASA's Space Technology Mission Directorate.

It was a very smooth countdown, followed by a nominal flight and another extremely accurate spacecraft insertion to the intended orbit, according to Randy Kendall, vice president of Space Launch Operations. However, the smooth countdown belied the amount of activity that took place in the days leading up to the launch.

"This team continues to amaze me with their dedication to the launch mission," Kendall said. "Last week they were simultaneously working close-out of issues from the post-flight review from the Atlas V MUOS-4 launch last month, the post-flight crossover assessment for the Atlas V Morelos launch last week, preparing for this launch, and conducted the Aerospace Readiness Review for the upcoming Atlas V GPS IIF-11 launch scheduled for the 30th of October."

He congratulated the team on this latest success:

"My thanks to the entire launch team and congratulations to the customer on another critical national security asset successfully delivered to orbit."



An Atlas V lifts off from SLC-3E at Vandenberg Air Force Base carrying a national security payload on Oct. 8. (Photo: United Launch Alliance, LLC)

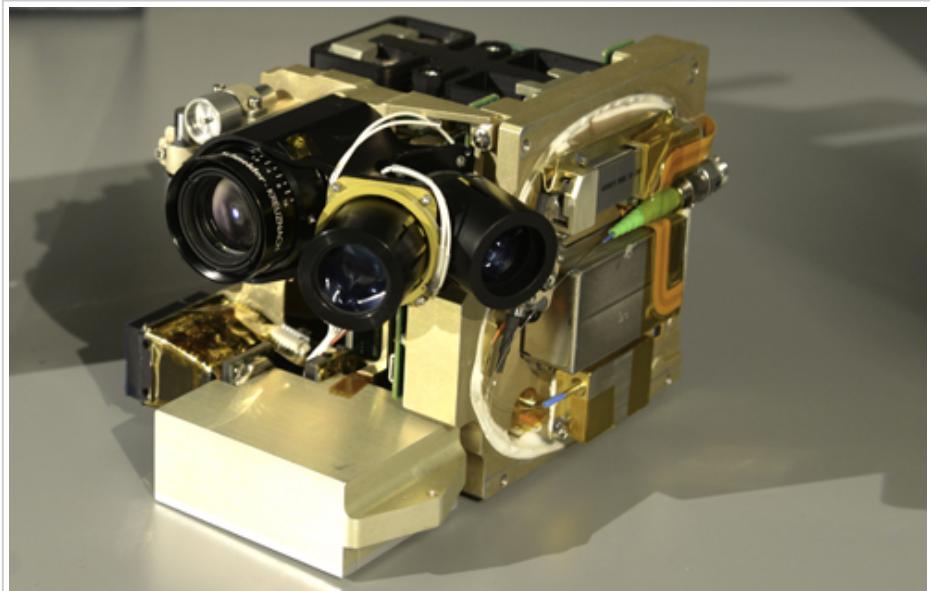
Cutting-Edge CubeSat Pathfinder Mission Suffers Software Failure

October 15, 2015

A software malfunction has disabled key components of the AeroCube-7 launched last Thursday from Vandenberg Air Force Base.

The first AC-7, part of NASA's Optical Communications and Sensor Demonstration (OCSD) mission, was designed to be a pathfinder to demonstrate most of the subsystems required during operation of the next two OCSD satellites, which are still on schedule to launch next year.

"We encountered an anomaly with the satellite over the weekend that has resulted in early termination of most of the mission," said Dr. Sherrie Zacharius, vice president of Technology and Laboratory Operations. "There were two errors, one in the software code structure and one in the process used to upload new code."



An AeroCube-7, similar to the one shown here, suffered a software malfunction after reaching orbit. (Photo: Eric Hamburg)

During extensive software upgrades, the satellite went through one of its normal reboot sequences in the middle of a software change in the attitude control system (ACS) processor. When the satellite restarted, the ACS processor not only booted into a mode that disabled the processor altogether, it also limited the performance of several other processors.

Aerospace engineers were able to reproduce the anomaly in a ground unit and understand root cause of the problem.

Aerospace executives pointed out that missions such as the first AeroCube-7 are designed to test new technology, which sometimes doesn't work on the first try.

"We celebrate our successes and embrace and learn from our failures," said Dr. Dave Gorney, executive vice president.

Chuck Gustafson, senior vice president, Engineering and Technology Group, said "customers understand and know they are accepting a risk," when they ask for advanced technology produced on a fast-development schedule. "In this arena, the customer values our ability to move quickly. We take on additional risk but help them measure that risk in a reasonable way."

As disappointing as the loss is to the Aerospace team, which involves dozens of people throughout ETG and their partners in NASA's Small Spacecraft Technology Program (SSTP), the flying satellite will still provide useful information.

"Although the loss of the attitude-control system (ACS) is a significant setback, we have been evaluating which other systems in the satellite can still serve a useful risk-reduction function for future flights," said Dr. Rich Welle, director of the Microsatellite Systems Department. "For example, we have been able to get initial data from our software-defined radio, which is flying for the first time on this satellite."

In the wake of the anomaly, the team will modify the OCSD software, update upload processes, and refine the pre-flight testing of software and processes to ensure that this issue will not happen again.

Gustafson said results from a complete investigation into the AeroCube-7 anomaly will be incorporated into a Corrective and Preventive Action (CAPA) report and be reviewed by the Corporate Quality Management Office.

Fawcett Appointed PD in GEOINT Innovation Office

October 27, 2015



Dr. Philip Fawcett

Dr. Philip Fawcett has been appointed principal director, GEOINT (Geospatial Intelligence) Innovation Office, Imagery Programs Division (IPD), National Systems Group.

In this position, Fawcett is providing technical leadership in support of several IPD customers covering technology, future planning, and advanced programs.

Fawcett joined Aerospace in 1992 as a member of the technical staff in the Fluid Mechanics Department in the Engineering and Technology Group (ETG). His most recent previous assignment was principal engineer, Directorate H, Electronic Programs Division, where he supported the acquisition of national assets.

Fawcett earned bachelor's, master's, and doctorate degrees in aerospace engineering from the Georgia Institute of Technology.

Awards and Recognitions, Fall 2015

by Matthew Kivel

October 13, 2015

Aerospace employees frequently earn recognition for their professional accomplishments. This Orbiter feature will acknowledge those honors and awards, including the publication of books. To nominate someone for consideration in this section, send details of the award in a timely fashion to orbiter@aero.org, or contact Matt Kivel at mattthew.k.kivel@aero.org. Include a photo related to the award, if available.

Dr. Todd Beltracchi

Dr. Todd Beltracchi, senior project engineer, Space Based Sensing Division, was awarded the prestigious NASA Silver Snoopy Award in a ceremony at Schriever AFB on Aug. 25. The award was presented by Col. Robert Behnken, former Chief of the Astronaut Office. Dr. Beltracchi was specifically recognized for showing excellence in support of the nation's human spaceflight endeavors.

The Silver Snoopy Award is one of the most prestigious awards given by NASA. It is presented by the Human Exploration and Operations Mission Directorate to individuals who have made outstanding achievements related to human flight safety or mission success. Dr. Beltracchi received this award for his sustained contributions to mission success, for his continued support of every NASA launch involving U.S. astronauts, and for his application of engineering principles to assist in analysis of in-flight anomalies.

Roberta Gleiter

Roberta Gleiter, MTS, Software System Lifecycle, has been honored by The Society of Women Engineers (SWE) with the SWE Advocating Women in Engineering Award.



Col. Robert Behnken congratulating Dr. Todd Beltracchi on receiving the Silver Snoopy Award.

The Advocating Women in Engineering Award recognizes individuals who have demonstrated professional excellence in their chosen STEM field and have proven to be advocates of women in engineering and SWE's objectives. Gleiter will be recognized at the SWE Awards Banquet at the WE15 Conference on Friday, Oct. 23, in Nashville, Tennessee.

Rachel Morford

The Society of Women Engineers has selected Rachel Morford, project leader, Systems Integration and Test Office, to receive the SWE Distinguished New Engineer award.

The SWE Distinguished New Engineer award honors women engineers who have demonstrated outstanding technical performance, as well as leadership in professional organizations and the community, in the first ten years of their career. Morford will also be recognized at the SWE Awards Banquet at the WE15 Conference on Friday, Oct. 23, in Nashville, Tennessee.

AAIA Associate Fellows

The following Aerospace employees have been selected by the American Institute of Aeronautics and Astronautics (AIAA) as Associate Fellows:

Dr. David Bearden, general manager, Civil and Commercial Programs
Andrew Dawdy, general manager, Developmental Planning and Architectures
David Eccles, general manager, National Space Systems Engineering
Thomas Starchville, director, Mission Analysis and Operations
Dr. Wayne Van Lerberghe, director, Propulsion
Patrick Yee, senior engineering specialist, Fluid Mechanics

AIAA Associate Fellows are defined as individuals with at least 12 years of professional experience who have accomplished or been in charge of important engineering or scientific work, or have done original work of outstanding merit, or have otherwise made outstanding contributions to the arts, sciences, or technology of aeronautics or astronautics.

The Aerospace Corporation

The Aerospace Corporation has been named a Cobey Honoree by the Constitutional Rights Foundation (CRF) for its work with the CRF's Expanding Horizons Internships program. The company was officially honored at the Justice James A. Cobey reception on Thursday, Sept. 24, at the Bonaventure Brewing Co. in downtown Los Angeles.



Robert Stern, CRF president, with Aerospace Senior Vice President, General Counsel, and Secretary Malissia Clinton, who received the award on behalf of Aerospace.
(Photo: Constitutional Rights Foundation)

October 2015 Obituaries

by Elaine Young
October 01, 2015

Sincere sympathy is extended to the families of:

David Mizer, member of technical staff, hired Oct. 10, 1983, retired July 1, 1988, died Sept. 5, 2015.
Franklin Koenig, member of the administrative staff, hired Nov. 14, 1960, retired Oct. 1, 1988, died Sept. 1, 2015.
Masami Miyahira, office technical support, hired May 12, 1969, retired Dec. 1, 1996, died Sept. 10, 2015.

To notify Aerospace of a death and have it included in the Orbiter, please contact Cynthia Johnson in Human Resources at 310-336-5806.

October 2015 Notes

by Elaine Young
October 01, 2015

Notes of appreciation to fellow employees and Aerospace for thoughtfulness and sympathy have been received from:

Tim Schroeder, on the recent passing of his father-in-law, Chuck Ainsworth.
Tom Morgan, on the recent passing of his mother, Norma Morgan.
Violet Barghe-Sharghi, on the recent passing of her mother-in-law, Hao Hang.

To submit a note of appreciation to Aerospace, please contact Valerie Jackson in Human Resources at 310-336-0891.

October 2015 Anniversaries

by Elaine Young
October 01, 2015

5 Years

Engineering and Technology Group: Andrew Mollner, Brianne Williams, Chibueze Ogamba, Edward Carolipio, Jason Young, John Gevargiz, Kyungsik Kim, Leon Palmer

National Systems Group: Jeff Goodell, Richard Barnisin

Operations and Support Group: Valerie Jackson

Space Systems Group: Arnoldo Silva, Jay Jacobs, Raymond Bonesteele

Vaeros: Sherreth Vaughan

10 Years

Engineering and Technology Group: Diana Alaan, Mark Nixon, Preston Partridge

National Systems Group: Lisa Mohn, Patrick Almazar, Steven Brownell, Vickie Wagner

Operations and Support Group: Tracy Ferington

Systems Planning, Engineering, and Quality: Patrick Schubel

15 Years

Engineering and Technology Group: Calvin Kalbach, Joseph Estrada, Marsha Moone, Roland Duphily, Thomas Curtiss

Enterprise Information Services: Robert Vesely

National Systems Group: Kim Briscoe

Space Systems Group: Diane Stoner

Systems Planning, Engineering, and Quality: Roseanne Villalobos, Thomas Adang

Vaeros: David Adlis

20 Years

Engineering and Technology Group: David Kunkee, Peter Frantz

Vaeros: Steven Covington

25 Years

Audit, Controls, and Compliance Directorate: Eunice Joachim
Engineering and Technology Group: Margaret Chen
Enterprise Information Services: Daniel Goodenberger
Operations and Support Group: Barbara Sampson, Stephen Presley
Space Systems Group: Bruce Steiner, Hakan Ozisik, Jeffery Emdee, Ronald Marchetti

30 Years

Engineering and Technology Group: Ragini Joshi, Renny Fields
Enterprise Information Services: Constance Cureton, Vincent Reher
Space Systems Group: Mark Brosmer
Systems Planning, Engineering, and Quality: Lisa Kobayashi, Miriam Nadel

35 Years

Engineering and Technology Group: Philip Grant, Virginia Bixler
Operations and Support Group: Thomas Brown
Space Systems Group: John Ligda
Systems Planning, Engineering, and Quality: Patricia Chambers

40 Years

Enterprise Information Services: Emily Montoya
Operations and Support Group: Johanna Rosser

45 Years

Engineering and Technology Group: Harold Yura

50 Years

Space Systems Group: Delbert Bakeman
Systems Planning, Engineering, and Quality: Jan Prazak