

All Hands Meeting Recaps a Year of Change and Opportunity

by Wendy O'Dea

December 18, 2018

Aerospace President and CEO Steve Isakowitz and Executive Vice President Wayne Goodman recapped the first quarter of the fiscal year at the December corporate All Hands meeting on Monday, Dec. 17, noting that 2018 was a year filled with change, opportunity, and challenges that Aerospace is meeting head-on.

"We've been working hard the past two years and Aerospace is doing great," Isakowitz said, kicking off the meeting to a packed house in El Segundo, with thousands more participating via video conferencing at locations across the country. It was a record attendance for a CEO quarterly report, with 3,000 people watching the event, representing 75 percent of the Aerospace population.

Isakowitz and Goodman introduced the new chief technology officer (CTO), announced xLab, the new name for the Technical Demonstration Center, and highlighted accomplishments of the past year.

Keeping Up with Technological Change

Dr. David Miller will become vice president and chief technology officer (CTO). This is a newly created position based in El Segundo, reporting directly to the CEO. Miller will enhance the company's efforts in the growing importance of new technologies and game-changing ideas.

He was most recently the director of the Space Systems Laboratory and the Jerome C. Hunsaker Professor in the Department of Aeronautics and Astronautics at Massachusetts Institute of Technology. He has also served on the Air Force Scientific Advisory Board and served two-and-a-half years as NASA's chief technologist in Washington, D.C.

Miller will help lay out technical strategy and vision, including managing four key activities currently underway: the Engineering, Science, and Technology Hubs; ensuring that Aerospace technical fellows are being utilized in the best possible way; and overseeing both iLab and xLab (short for Experiments Lab) — the recently-announced technology demonstration, or prototyping, center.

Aerospace experts working in xLab spoke briefly, highlighting some of the cool technologies currently in progress including ECP-Lite, a package of sensors to determine whether radiation is space weather or a hostile attack; AeroCube 11, a project to move CubeSats from testbeds to operational satellites; and Polar Scout, a small satellite project to help the Coast Guard locate endangered vessels in Arctic waters.

Project Thor and Project Odin

Project Thor, Aerospace's quick and well-received response to Congress' request that the Department of Defense be more responsive in space, has been well-received. Isakowitz said that the next step for the project, which provides a holistic picture of what needs to happen next and reinforces Aerospace's commitment to shaping the future, is implementing the recommendations Aerospace has made.



President and CEO Steve Isakowitz and Executive Vice President Wayne Goodman at the December 2018 All Hands meeting. (Photo: Elisa Haber)



New Chief Technology Officer Dr. David Miller is introduced at the December All Hands meeting. (Photo: Elisa Haber)

One of those is Continuous Production Agility, or CPA, which involves using the strength of the industrial base to more rapidly develop new capabilities that can be inserted into products and processes that will be employed to outpace the threats to the space assets of the U.S. and its allies.

Isakowitz also introduced Project Odin, an internal project to brainstorm what else Aerospace can be doing to stay ahead of the curve. Project Odin aims to expand Aerospace's customer base, enhance mission assurance, outpace threats, and improve technical velocity.

Mission Success and Quarterly Progress

After highlighting the successful AEHF-4 launch in October, the 50th successful ULA launch for the U.S. Air Force, Goodman discussed upcoming launches with which Aerospace has been involved.

Goodman then touched on some of the other accomplishments as they relate to the strategic imperatives:

Growth

- In FY18, Aerospace delivered 2,543 STE, a 10 percent increase from FY17, and delivered on a 132 STE increase that came mid-year. Aerospace hired almost 560 new employees, a 35 percent increase over last year.
- Aerospace was awarded a 10-year contract by SMC. "This is unprecedented," Goodman said, "and recognizes the strong partnership with our government customers." Previous contracts were five years.
- Aerospace will soon submit a proposal to NASA for the largest contract ever.
- The CSG team exceeded its yearly revenue and net margin goals, which benefits all customers through reduced overhead.

Innovation

- The corporation is making strategic investments in cross-cutting technologies to strengthen the company's technical edge and is investing seed money in the areas of artificial intelligence, optical communications, hypersonics, and model-based systems engineering.
- As part of the National Engineering and Technology Group (ETG) initiative, Goodman shared that East Coast lab capabilities are also being expanded. National Systems Group and ETG have looked at customer demands and identified areas of need.
- On Dec. 15, two innovative CubeSats developed by Aerospace were launched on an Electron rocket from New Zealand and images will be relayed to the ground through high-speed laser communication downlink.
- Aerospace teamed up with JPL on a project called [Solar Gravity Lens](#), which will enable enhanced viewing of exoplanets located light years away.

Velocity

- There was a 52 percent decrease in security infractions and violations compared to last year, resulting in a superior security rating from the Space and Missile Systems Center (SMC).
- Hiring time for new employees was reduced by 70 percent. A 2019 employee engagement survey will be initiated in January and all employees are encouraged to participate.
- The executive reporting structure will be changing in January with the vice presidents of EIS, People Operations, and Office of the CFO reporting directly to the president/CEO or executive vice president. Leaders of Corporate Communications, Security and Safety, and Facilities will continue to report to the chief velocity officer.



Project Engineer Bill Crain discusses xLab's ECP-Lite project. (Photo: Elisa Haber)

Aerospace Corporate Awards and Aerospace Cares

Before the meeting closed with two fun holiday videos, Goodman announced changes to the Corporate Awards Program. There will be new categories based on achievements that directly support the Aerospace corporate values and strategic imperatives and these awards will be more inclusive of the entire Aerospace workforce. The nomination process will also be simplified. Winners of other awards, including the Employee Resource Group award winners and division award winners, will also be included.

Hero and CEO 007 Awards

The Hero Awards are presented throughout the quarter to various individuals, and some were recognized at the All Hands meeting for their contributions:

- Shaping the Future Hero Pin: Patrick Brown and Jeremy Eckhart, for their leadership in the development of the Space Warfighting Scenario for USAF Leadership's Corona Fall 2018 at Colorado Springs.
- Innovation Hero Pin: Lynn Friesen, for her critical efforts in evolving prototyping efforts into a fully actuated tech demo center; and Mike Stallard, for his direct systems engineering and technical advisement to the AFRL Center for Rapid Innovation, which is directly benefiting the warfighter in a war zone.
- Growth Hero Pin: Margie Eastman, for her pivotal work on the Polar Scout, a dual-CubeSat system with search and rescue payloads.
- Velocity Hero Pin: Bob Cummings, the leader of the Security team, for relentless improvement in Aerospace's security posture over the last three years, resulting in the top security grade from the Space and Missile Systems Center.

The CEO 007 pin was awarded to Lisa Neufeld, for the role she played in securing the precedent-setting 10-year contract renewal with SMC.

Happy Holidays

Before closing, Goodman and Isakowitz thanked employees for their work throughout the past year, and confirmed the merit increases have been approved by the board of trustees. They also encouraged employees to participate in the holiday gift drives and in Aerospace Cares, the new corporate citizenship program.

SpaceX Makes History With GPS III Launch

December 24, 2018

Generating a million and a half pounds of thrust, a SpaceX Falcon 9 rocket lifted off into history Sunday morning as its nine Merlin engines lit up the Florida Space Coast.

It was SpaceX's first Air Force National Security Space (NSS) mission — carrying the first, Global Positioning III Space Vehicle satellite to orbit.

The Aerospace Corporation worked extensively with the Air Force and SpaceX to prepare the company for its NSS mission. Aerospace was also deeply involved in developing the new GPS III series, which boasts numerous upgrades over previous GPS models. These include better anti-jamming capabilities; more military and civilian signals that are more accurate and powerful; specialized signals, such as for aviation services; and a signal that can be used with other satellite navigation systems such as the European Union's Galileo system.

The launch was also the first time Aerospace utilized the Agile Monte Carlo cloud platform analysis tool. A new, more efficient platform for simulating launch trajectory, Agile Monte Carlo is used to verify orbit injection accuracy, propellant margins, flight software robustness, and vehicle response to launch-day winds.

"Monte Carlo is the type of analysis where we simulate the same mission multiple times while varying input parameters, approximately 10,000 runs to ensure high-statistical confidence, and observe the resulting variations in the output parameters," said Slava Ananyev, a senior project engineer working on the project with teams from the Engineering and Technology Group and Enterprise Information Services. "This then gives us a sufficient statistical set of expected results."

[Click here](#) for complete story.



*SpaceX's Falcon 9 rocket carrying the GPS III satellite launched from Cape Canaveral.
Photo courtesy of SpaceX.*

Capitol Hill Event Focuses On The Threat Of Space Weather

December 20, 2018

A group of experts recently gathered on Capitol Hill for a conversation on how space weather and radio frequency spectrum can have a tremendous effect on the world. The event, [Breaking Space: A Discussion on Space Weather Disturbance and Spectrum Interference](#), featured a panel of experts from NASA, the U.S. Air Force, the White House, the European Space Agency (ESA), and Aerospace. Moderated by Dr. Josef Koller of Aerospace's Center for Space Policy and Strategy, the discussion touched on the challenges space weather presents, along with the opportunities for collaboration and sound policy making.

Keynote speaker Dr. Scott Pace, executive secretary of the National Space Council, described RF spectrum—which wireless technology and systems such as mobile devices, broadcast entertainment, and WiFi rely on and are increasingly consuming—as being like oxygen, in that you don't notice it until you are running out. Fellow keynote speaker Jennifer A. Manner, senior vice president for regulatory affairs at EchoStar Corporation, added that neither the formal nor informal processes in place to handle spectrum issues are ready to deal with the bad actors who threaten spectrum use.

[Click here](#) for complete story.



CSPS's Josef Koller introduces the space weather panel.

Aerospace to Create New Center to Study Space Weather

by Gail Kellner

December 06, 2018

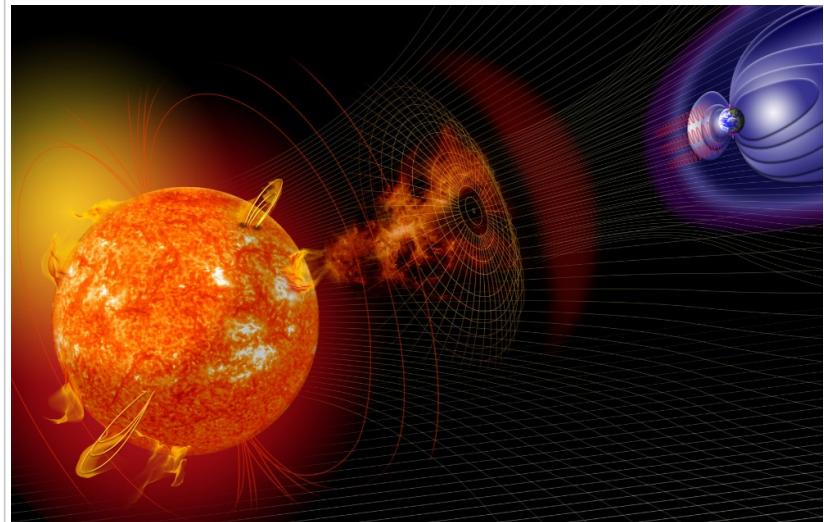
As society's reliance on technological systems grows, so does our vulnerability to space weather. To address this phenomenon, Aerospace is poised to create a center where like-minded heliophysicists can collaborate to make advancements in research studies about the dynamics of space weather.

The Center for Assessing Space-weather Impacts and Innovation (CASII) will focus on carrying out basic heliophysics research to improve the understanding of different types of space weather events that can result in major impacts to society.

Space weather refers to the dynamic conditions in the Earth's outer space environment. It includes all events on the sun, in the solar wind, in near-Earth space, and in our upper atmosphere that can affect space-borne and ground-based technological systems. Heliophysics is the study of the Earth-space environment.

Dr. Alexa Halford, member of the technical staff, Space Sciences Department, is part of a small group of heliophysicists who has an interest in creating a larger, more dynamic community.

[Click here](#) for full story.



Artist concept of the dynamic conditions in space. (Illustration: NASA)

The Quantum Key to Communications

by Gabriel A Spera
December 10, 2018

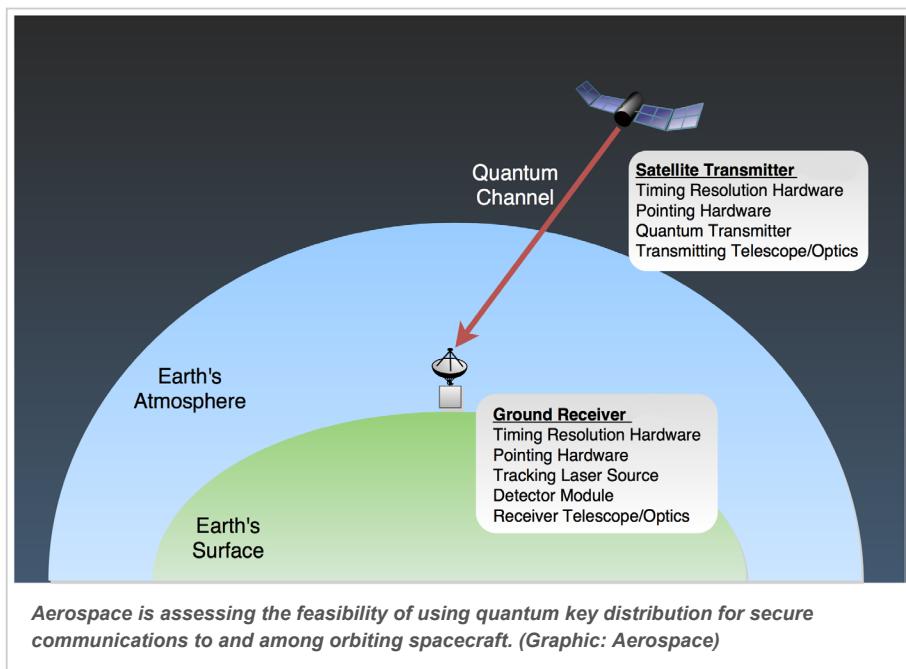
In the cloak-and-dagger days of international espionage, spies and their handlers would often communicate via coded messages. Each would have an identical notepad of cryptographic keys used to code and decode their communiqués. After each transmission, the keys would be destroyed, rendering the messages virtually indecipherable.

That worked well for human actors, who could clandestinely meet to receive their keys before going their separate ways. It's much harder for computers, which need to receive their keys over insecure communication channels. As a result, most computers rely instead on algorithms that would require an impractically long time for unauthorized users to crack, but could be cracked if enough computing power was applied by so-called brute force.

Quantum physics may provide a better alternative. In traditional radio frequency communications, binary data is encoded on a radio wave by modifying its amplitude, frequency, or phase. The quantum approach encodes data on an individual photon, typically based on its polarization. Security comes from the fact that in the quantum world, the act of measuring a particle's state changes that state.

Furthermore, a basic tenet of quantum physics—the “no cloning” theorem—asserts that an unknown state cannot be perfectly duplicated. Thus, any attempts to secretly intercept or recreate the information would fail.

[Read more about The Quantum Key to Communications](#)



Pathfinding AeroCube Launched to Provide High-Value Capability at Fraction of Cost

December 18, 2018

EL SEGUNDO, Calif., Dec. 18, 2018 – In this dynamic new environment demanding rapid technological evolution and faster access to space, [The Aerospace Corporation](#) (Aerospace) has designed the innovative Rapid + Responsive + Reimagined (R3) CubeSat to meet the pressing need for faster acquisition speed at a fraction of traditional costs. Rocket Lab's small satellite launcher, Electron, successfully launched R3 on Dec. 16 at 7:33 p.m. New Zealand time (10:33 p.m. PST Dec. 15), from its New Zealand's Māhia Peninsula launch site.

R3 is an experiment in smallsat low Earth orbit (LEO) technologies that will focus on faster development of new prototype concepts at lower costs.

“Our Innovation Lab (iLab) supported the development of this new technology in half the time it takes to build larger systems,” said Dr. Randy Villahermosa, executive director of iLab. “R3 is two percent of the size of larger spacecraft and three percent of the cost of larger satellites. Our plan is to experiment with several off-board artificial intelligence (AI) technologies that will be critical to creating future space capabilities and building resilient architectures. For example, automated image processing and feature-flagging using AI.”

R3 is exploring the edge of the possible in smallsat capabilities in remote monitoring of vegetative health that has previously only been performed by traditional larger spacecraft. R3 will provide remote sensing operations for AI training and a multi-spectral imager

to capture images from space. Transmission of those images will be delivered through a 200 Mbit/sec. laser communications downlink as successfully demonstrated in AeroCube-7 as part of NASA's Optical Communications and Sensor Demonstration (OCSD) mission. Aerospace's innovative smallsat laser technology provides space-to-ground communications that is 100 times the rate than any other current CubeSat on orbit – a major milestone in capabilities that is normally performed by larger satellites.

"R3 is just one example of our innovation strategy to develop new capabilities in the lab that can be tested quickly on CubeSats to buy down risk in future operational systems," said Villahermosa. "The space industry has entered a new era in which venture-class rockets will enable responsive launch of smallsats to rapidly develop proliferated architectures in the future."

About Aerospace CubeSats

Aerospace was an early pioneer in the development of nanosatellites (1–10 kilograms; 4 to 12 inches) and picosatellites (0.1–1 kilograms; under 4 inches). Company researchers continue to conduct pathfinding research in the field by developing new technologies for smallsats that have not been previously demonstrated. Since 1999, Aerospace has flown 33 nano- and picosatellites, with six scheduled to launch in 2019. Today, Aerospace is one of the leading private operators of satellite constellations worldwide with 19 AeroCubes currently operating on orbit on a variety of missions.

Aerospace Names Dr. David Miller to New Chief Technology Officer Position

December 18, 2018

EL SEGUNDO, Calif., Dec. 17, 2018 – Committing to continue to define and harness the rapidly changing technology landscape across the space enterprise, [The Aerospace Corporation](#) (Aerospace) has selected Dr. David W Miller as vice president and chief technology officer (CTO). This is a newly created position based in El Segundo, Calif., reporting directly to Aerospace's CEO.

"David's passion for new space, innovation, and experience with our most senior customers are critical as we work to outpace the threats in space," said Steve Isakowitz, Aerospace president and CEO. "His experience developing agile space solutions – including rapid prototyping and new space demonstrations – across the academic, civil, commercial and national security space enterprise are a perfect match for the leadership we need from our chief technologist."

Miller joins Aerospace from the Massachusetts Institute of Technology (MIT), where he most recently held the position of director of the Space Systems Laboratory and the Jerome C. Hunsaker Professor in the Department of Aeronautics and Astronautics. At MIT, Miller's work focused on developing ideas for spacecraft that can repair and upgrade satellites with multi-mission functions through space operations and docking using standard interfaces. He also helped develop a technique to control satellite movement, without propellant, using high temperature super-conducting electromagnets.

As Chief Technology Officer, Miller will provide vital leadership for the company's growing prototyping efforts through his supervision of Aerospace's Experiments Lab, or xLab, previously the Technology Demonstration Center. He will also oversee Aerospace's Innovation Lab (iLab) and the company's Science & Technology Hubs.

Earlier in his career, Miller served five years – two as vice chair – on the Air Force Scientific Advisory Board, a federal advisory committee that provides independent counsel on science and technology matters relating to the Air Force's mission. He also served two-and-a-half years as NASA's Chief Technologist at its headquarters in Washington, DC. Miller has been involved with and chaired several key panels and committees to include the James Webb Space Telescope Product Integrity Team and Exoplanet Technology Assessment Committee. He is an AIAA Fellow and formerly a distinguished visiting scientist at NASA's Jet Propulsion Laboratory. Miller earned his undergraduate and graduate degrees from MIT, and has been a member of its faculty since 1997.



Dr. David Miller joins The Aerospace Corporation as chief technology officer.

Awards and Recognitions, December 2018

by Gail Kellner

December 19, 2018

Aerospace employees frequently earn recognition for their professional accomplishments. This Orbiter feature acknowledges those honors and awards, including the publication of books. To nominate someone for consideration in this section, send details of the award to orbiter@aero.org.

Peggy Tatum

Peggy Tatum, applications administer specialist, Unified Communications Applications, was selected as the 2018 Heroine of Washington Technology Award recipient during the March of Dimes Gala in Tysons Corner, Va., on Nov. 14. This is the second year in a row that the winner has come from The Aerospace Corporation.



The Heroines of Washington is an annual event in which women are recognized and honored for their dedication to community service and work in the healthcare, real estate, professional services, public sector, and technology industries. The goal of the award is to shine a spotlight on women who make a difference in the world through STEM programs, to empower girls and other women, as well as inspire others.

Dr. James Northern III

Dr. James Northern III, senior project leader, Acquisition and Technology, will be honored in February 2019 at the 33rd Black Engineer of the Year Awards (BEYA) Science, Technology, Engineering, and Mathematics Global Competitive Conference.

Northern will be honored under the category of Community service – Industry. BEYA categories recognize exceptional careers in government and industry, and actions that have energized both corporations and communities.

BEYA winners will be featured in the conference edition of US Black Engineer and Information Technology magazine to be published in February.

December 2018 Obituaries

by Christine T Kato

December 01, 2018

Sincere sympathy is extended to the families of:

Warren Begley, member of technical staff, hired April 27, 1964, retired April 1, 1979, died Oct. 17, 2018

Walter Buell, member of technical staff, hired March 3, 1997, died Oct. 31, 2018

Glenn Colbert, office of technical support, hired March 31, 1980, retired Sept. 1, 2013, died Oct. 27, 2018

Ralph Herbert, member of technical staff, hired Jan. 28, 1980, retired April 1, 2015, died Oct. 22, 2018

Robert Johnson, member of technical staff, hired March 3, 1980, retired Dec. 1, 1990, died Nov. 12, 2018

Donal Jolley, office of technical support, hired May 15, 1961, retired Oct. 1, 1998, died Oct. 16, 2017

Paul Marx, member of technical staff, hired March 20, 1961, retired April 1, 1988, died Oct. 8, 2018

Geoffrey Smit, member of technical staff, hired April 14, 1980, died Nov. 17, 2018

Ernest Urata, member of administrative staff, hired Feb. 12, 1980, retired July 1, 1997, died Nov. 15, 2018

To notify Aerospace of a death and have it included in the Orbiter, please contact People Operations at (310) 336-5107.

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2310 E. El Segundo Blvd., El Segundo, CA 90245-4691

310-336-5000

www.aerospace.org

Orbiter staff: orbiter@aero.org