

Propelling the Field of Small Sats Forward

August 21, 2019

Small satellites are becoming more and more capable, taking over missions that used to require larger spacecraft. However, adding propulsion systems to these smaller platforms remains a challenge, which means many small sats are limited to applications that do not require active orbit maintenance, increases in altitude, or changes in inclination.

Working in conjunction with the University of Southern California, Aerospace is developing a monopropellant vapor propulsion system that could help solve this problem.

"This type of system could enable the satellite to perform formation flying, auto rendezvous, extend mission durations, or change orbits while not substantially affecting power or volume budgets," said Dr. Brandie Rhodes, the principal investigator on this project.



Small satellites face some unique challenges in terms of propulsion. To start with, they obviously don't have much space for a propulsion system. In addition, they often launch with other satellites, and their propellant must not present a risk to the satellite sitting next to them in the launch vehicle.

Small sat propulsion systems do exist. In fact, Aerospace developed a xenon cold gas thruster that launched in 2006 and a steam thruster that flew in 2017. The problem is that these and other small satellite propulsion systems require some compromise in pressure, power, or performance.

Rhodes and team are looking at a different way of tackling the problem. They patented a method of evaporating the vapor off a liquid propellant (such as hydrogen peroxide), and then delivering the vapor to a catalyst to react.

[Read more here.](#)

Going Into Action With AeroCube-10

August 12, 2019

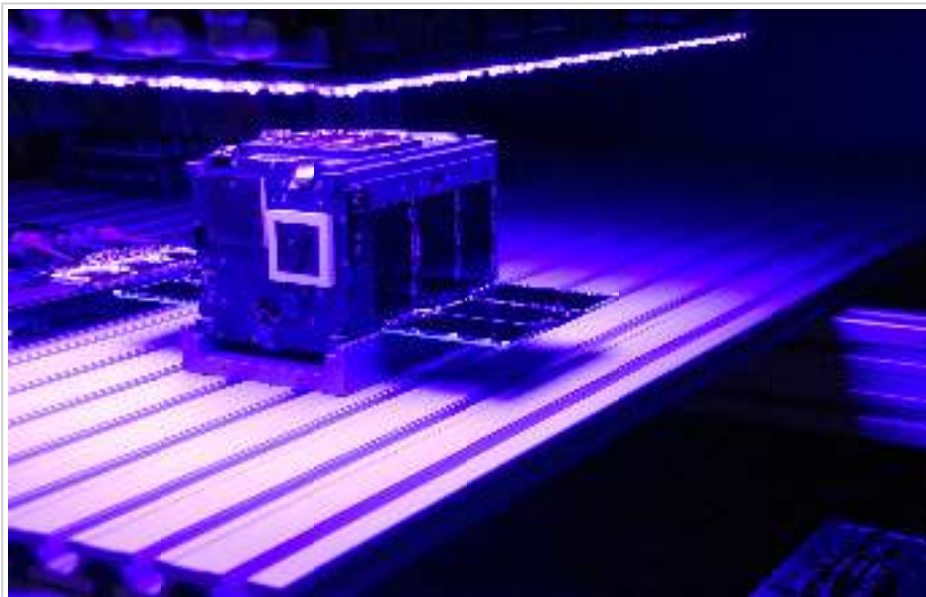
The AeroCube-10 dual CubeSat mission, packed with space experiments and technology demonstrations, was launched into orbit from the Cygnus automated cargo spacecraft after its recent departure from the international space station.

Possibly the most intriguing experiment aboard the Aerospace-funded spacecrafts was designed in-house at Aerospace and consists of hardware for a never-before-done mission. The hardware is a dispenser with a set of 28 atmospheric probes, releasable one at a time on command. These lightweight circular probes unfold into three orthogonal 98 mm diameter disks and weigh only 16 grams. They will reenter within months and will provide sensitive in-situ measurements of the variations in the density of the Earth's thermosphere (atmosphere from about 50 to 600 miles above the Earth's surface), which has not been studied extensively.

The probes were the brainchild of Aerospace's Jerry Fuller, following a hallway discussion in Chantilly with Andrew Abraham, who was working on deorbit analysis and noted that it would be good to have real-time information about conditions in the upper atmosphere. They both wondered whether CubeSats might be able to provide missing information.

Fuller gave some thought to the problem, and that afternoon came up with concept sketches for the probes. After returning to El Segundo, Fuller got together with Dr. Rebecca Bishop of the Space Sciences Department and proposed an experiment based on the concept. Later, the concept was incorporated into the AC10 project, the deployer was designed and testing ensued on the probes to ensure they functioned correctly and could be observed clearly as they returned to Earth.

[Read more here.](#)



Aerospace Opens Expanded Albuquerque Facilities to Support Growing Mission

by **Conor Shine**
August 01, 2019

The Aerospace Corporation emphasized its continuing role as an engine of innovation for national security space and the nuclear deterrence program with the opening of expanded facilities in Albuquerque on Thursday.

Aerospace's presence in Albuquerque has reached record levels, with about 100 scientists and engineers primarily supporting the Department of Defense and the National Nuclear Security Administration. The expanded facility will improve channels of communication with the NNSA, the Air Force and Aerospace's El Segundo campus.

"In our time in Albuquerque, Aerospace has forged enduring partnerships with the NNSA and the Air Force nuclear and space programs to ensure they remain vital elements of our national security," said Steve Isakowitz, Aerospace president and CEO. "Our work has already resulted in new programs for Air Force Space Command's Space Rapid Capabilities Office at Kirtland Air Force Base. As we demonstrate our value in nuclear deterrence, we look forward to helping shape the future of \$150 billion in nuclear programs."



Aerospace president and CEO Steve Isakowitz cuts the ribbon at the newly expanded Albuquerque facility along with senior vice president Ed Swallow and Kent Jones, assistant deputy administrator for defense at the NNSA. (Photo: Bryan Tsunoda)

Following the ribbon-cutting ceremony, Isakowitz spoke at an all-hands meeting where he complimented the Albuquerque team for their outstanding work supporting nuclear and other space missions.

The United States' nuclear capability remains a cornerstone of the country's deterrence strategy at a time when international security is growing more complex in a new era of contested space.

Aerospace has a long history with the country's nuclear program, supporting the development of advanced nuclear missile technologies and missile defense programs through its initial 1960 contract with the Air Force Ballistic Missile Division.



President and CEO Steve Isakowitz talks with Aerospace employees at an all-hands meeting in Albuquerque.

The company's presence in New Mexico dates to the early 1980s, when a handful of engineers began supporting satellite research programs.

Since then, the office has grown to support a number of critical programs over the years, including the Air Force Research Laboratory, the DOD's Operationally Responsive Space Office and the Air Force Nuclear Weapons Center, for which Aerospace provides end-to-end expertise in launch and on-orbit mission success.

The Space Rapid Capabilities Office has been a key recent growth area, with the number of Aerospace technical staff supporting the office tripling since the start of the year and further growth projected in 2020.

"We are cutting the ribbon symbolizing the opening of our new secure facility for our work with the National Nuclear Security Administration as well as the continued growth in Albuquerque as the innovation engine with National Security Space programs," Mark Jelonek, general manager of Advanced Development and Planning, said at Thursday's event.

Press Release: Aerospace Awarded Potential \$621M Engineering Services Contract by NASA

August 20, 2019

EL SEGUNDO, Calif., Aug. 20, 2019 —[The Aerospace Corporation](#) (Aerospace) has received a sole-source nine-year follow-on contract with a total potential value of \$621 million from NASA, the company's third-largest customer, to provide NASA-wide Specialized Engineering, Evaluation and Test Services (NSEETS). The contract has a five-year base period that becomes effective on Oct. 1, 2019 with an additional four-year option.

The *IDIQ* (Indefinite Delivery/Indefinite Quantity) contract provides NASA with access to Aerospace resources and technical experts with deep understanding across the U.S. space enterprise. As the trusted advisor, Aerospace works across government and industry to provide objective analysis that is free from conflict of interest.



"We're delighted to continue delivering critical engineering, evaluation, and test services to NASA that will advance and shape the future of our nation's space exploration, science, and technology over the next decade," said [Edward Swallow](#), senior vice president of Aerospace's Civil Systems Group. "As the leading federally funded research and development center operator for space, our unique technical expertise and objective analysis align well with NASA's needs as it opens an exciting era of vital missions."

Aerospace will provide NASA with highly specialized functional expertise to support mission success. In addition, the company will provide multidisciplinary engineering services, testing, consulting, contractor-on-site monitoring, and evaluation of projects and programs, including safety, mission assurance, cost, and schedule analyses through any phase of NASA's programmatic lifecycle.

About The Aerospace Corporation

The Aerospace Corporation is a national nonprofit corporation that operates a federally funded research and development center and has approximately 4,000 employees. With major locations in El Segundo, Calif., Albuquerque, N.M., Colorado Springs, Colo., and Washington, D.C., Aerospace addresses complex problems with agility, innovation, and objective technical leadership across the space enterprise and other areas of national significance. For more information, visit www.aerospace.org. Follow us on Twitter: @AerospaceCorp.

AWC Celebrates 'Giant Leaps' in Honoring Aerospace Women of the Year

by **Conor Shine**

August 27, 2019

It's been 50 years since the crew of Apollo 11 touched down on the moon and took a giant leap for mankind. This August, The Aerospace Corporation's Aerospace Women's Committee is commemorating that milestone and the progress that's been made in the decades since with a week of activities and events.

"This year's Women's Week theme is 'Giant Leaps'... The theme reminds us of the great strides those before us made in their careers and lives that helped us to get to where we are today," said Julie Pinchak, AWC National President. "From the men and women who fought adversity for opportunities of equality to our community of mentors that helped us forge our path individually, there are so many people who helped us to get where we are and we have them to thank for the Giant Leap that we've all made."

AWC's 45th annual Women's Week kicked off on Aug. 22 with a speech in Chantilly, Va., from Deborah Lee James, 23rd Secretary of the United States Air Force. James shared her journey that took her from an early rejection from the U.S. Foreign Service to serving as a top military leader, recounting how she navigated the career path as a woman in a male-dominated field and as a civilian among a sea of military uniforms.

She spoke about the power of mentoring and building a network of support, as well as strategies to chart a course for your career while remaining resilient if things don't work out exactly as planned.

"Always lead with your strengths but recognize that you don't know everything and that's why you need a good team surrounding you," James said. "Don't be afraid those people will overtake you some day. Leverage those people. They're part of the team and they're important to the overall effort."

On Monday, the Colorado Springs office received a visit from Brig. Gen. DeAnna Burt, Director of Operations and Communications, Headquarters Air Force Space Command.

She spoke to employees about the power of embracing diversity, and the necessity of pushing back against bias and discrimination in the workplace. She challenged Aerospace employees to care for those who work with them and for them, supporting their colleagues in both their professional and personal development.

"That's what leadership is about. It's creating opportunities for the people who work for you," Burt said. "Looking at their skill sets, knowing their strengths and weaknesses, what do you need to get them to be the officer, the engineer or the project manager you need them to be?"



Women of the Year award winners pose with members of the Aerospace Women's Committee. (Photo: Elisa Haber)

Women of the Year Awards

Monday also featured the AWC's Women of the Year awards ceremony, where three Aerospace employees were recognized for contributions to the company and their communities. An invite-only Women of the Year luncheon will be held Tuesday.

The award winners are:

Hope Turney, an administrative specialist in the Advanced Development and Planning Division based in Albuquerque.

Turney worked in a variety of industries from banking to hotels to education before joining Aerospace in 1994. Since then, her work has been recognized with a number of awards and she's taken on numerous leadership roles, including serving as the first co-chair of the Office Professionals Advisory Team from a regional office.

She's also played a part in expanding employee resource groups to regional sites and has been a national officer in the Aerospace Totally Adaptable Group since 2012.

Outside of work, she's dedicated her time to various causes, often involving her sons' schools, including volunteering with baseball and band organizations, as well as the Make-A-Wish Foundation and the Albuquerque Animal Shelter.

"Working at The Aerospace Corporation nearly 25 years has been both a privilege and a joy because our strong corporate values align closely with my personal core values: Dedication, Excellence, Commitment, and Integrity," Turney said Monday. "It takes a village and I would like to thank 'my village' for the love, support, encouragement, and challenges that have made me the woman who stands before you today."

Caley Albert, a member of the Corporate Strategy Office based in El Segundo.

Albert first joined Aerospace in 2010 as a summer intern in the Information Systems and Cyber Division. After finishing her undergraduate degree, she went on to Loyola Law School in Los Angeles, but she continued to spend summers with Aerospace, supporting the Spacelift Telemetry Acquisition and Reporting System facility and later the legal department under the General Counsel.

She joined Aerospace full-time in 2014 after passing the bar, taking roles in STARS and in the Finance, Planning, Analysis and Reporting Department. Albert also assisted in the renewal of the 10-year FFRDC contract before joining the Corporate Strategy Office last year.

Albert is the co-leader of Take Your Kids To Work Day and worked to greatly expand the event. She is the current chair of the TECTalk program and is also actively involved in the Women's Committee. Outside of work, Albert enjoys exploring new activities around Southern California, visiting Disneyland and spending time with friends and family.

"It is an honor and a privilege to join the ranks of past WOTY recipients," Albert said. "The Aerospace Women's Committee is an invaluable resource and I am grateful for all my friends and colleagues in the various Employee Resource Groups."



Women of the Year award winner Hope Turney poses with Chief People Officer Heather Laychak. (Photo: Elisa Haber)



Women of the Year award winner Caley Albert poses with Chief People Officer Heather Laychak

Lina Cashin, a senior project engineer in the Defense Systems Operations Group based at Offutt Air Force Base in Nebraska.

Cashin served 24 years in the U.S. Air Force before retiring in 2013 with the rank of Colonel, serving in critical roles in space and cyber operations, policy and strategy.

At Aerospace, Cashin develops strategies, policies and requirements for space-based capabilities that support national security missions, in addition to serving as a policy analyst at the Center for Space Policy and Strategy.

She holds national leadership positions in the Aerospace Women's Committee and the Aerospace Military Veterans employee groups and has helped foster closer relations between Aerospace and the Air Force Academy.

Outside of work, Cashin is an active volunteer in school, church and veterans organizations and regularly participates in 5k fun runs to support local charities.

"I take true joy in working with individuals who have taken so many small steps to better themselves, their families, our communities, our country and the world," Cashin said. "It's those small steps that bring us closer. Closer to each other. Closer to our goals; closer to our mission. And when that Giant Leap occurs, you know it was the culmination of all those small steps."



Women of the Year award winner Lina Cashin poses with Chief People Officer Heather Laychak

AAPAA Recognizes Excellence With Liang Award

by **Conor Shine**
August 20, 2019

Kimberly Chung was honored with The Dr. Alexander C. Liang Asian Pacific American Achievement this month for her outstanding professional achievements and contributions to The Aerospace Corporation.

Chung, a senior project leader in the Advanced Extremely High Frequency Space Segment, joined Aerospace in 1999. Since then, she's served in a variety of roles, from performing simulations and analyses as part of the Control Analysis Department to overseeing hiring, staff appraisals and mentoring as a section manager in the department.

More recently, she's led efforts on the AEHF Spacecraft Bus Team to resolve AEHF bus and system engineering issues and supported efforts related to AEHF operational resiliency. Her work has been recognized by both the Air Force and Aerospace, most notably in the 2017 Space and Missile Center's Military Satellite Communications Systems FFRDC of the Year award for her role in resolving significant technical issues leading up to the launch of AEHF-4 in October 2018.

"She is generous in sharing her time and knowledge, providing mentoring for her peers and management. She prepares and provides high quality technical presentations to her team, management and customers to keep them apprised of any technical issues," a letter nominating Chung for the award read. "Her professional demeanor and technical aptitude are immediately apparent in any engagement with Ms. Chung."

A University of California, Los Angeles graduate, Chung spends her time outside of Aerospace volunteering with her son's Boy Scout Troop and with her church's ministry.

The award, sponsored by the Aerospace Asian Pacific American Association, is named in honor of Dr. Alexander C. Liang, a highly respected technical leader and former general manager of the Vehicle Systems Division. It recognizes an Aerospace employee who embodies Liang's values of doing what's right for Aerospace and the community.

The award ceremony featured a keynote speech from John Kobara, executive vice president and chief operating officer of the California Community Foundation.



John Kobara, executive vice president and chief operating officer of the California Community Foundation, delivered the keynote address at the award ceremony.



Kimberly Chung was recognized for her contributions to AEHF efforts and her leadership within the company.

Aerospace's GPS and NSSL teams honored for work on GPS III program

by **Conor Shine**
August 16, 2019

On Dec. 23, 2018, a SpaceX Falcon 9 rocket lifted off into space, carrying with it the first GPS III satellite.

While it took under two hours for the spacecraft to be deployed to its initial orbit, the historic moment — including the launch of a next-generation satellites and the certification of a new national security space launch provider — was more than a decade in the making, built on countless hours of work from The Aerospace Corporation employees and their government and industry partners.

On Thursday, members of the Global Positioning System and National Security Space Launch teams were honored for their role in the successful mission with a celebration and reception on the Paulikas Mall in El Segundo. The two groups received the Program Recognition Award earlier this year at the Aerospace Corporate Awards.



Employees from the GPS and NSSL groups were recognized for their work on last year's GPS III launch. (Photo: Gabrielle Robinson)

"What that launch represented is the best of what Aerospace has done over decades of honing our mission assurance, our dedication to mission success and technical excellence. It's a recipe we can't take for granted," said Aerospace president and CEO Steve Isakowitz. "This program and what you've achieved really has been in many ways a poster child for where this company is going in the future."

Thursday's event included remarks from Isakowitz, as well as several other leaders involved in the mission, including Akhil Gujral, General Manager of the Launch Systems Division; Steven Leontis, General Manager of the Navigation Division; Dr. Walter Lauderdale, Chief of the Air Force Space and Missile Systems Center's Launch Enterprise Systems Directorate; and Cordell DeLaPena Jr., Director of the Program Management and Integration Directorate at the Space and Missile Systems Center.

"Our journey is not over and neither is this team's. There are many more changes as we try to adapt to our industry partners and where they're going so we can do our job effectively, do our mandate for mission success and yet do it in partnership that allows them to be successful as well," Lauderdale said. "There are more challenges and more fun to be had."



Aerospace employees were honored at a reception held on the Paulikas Mall in El Segundo. (Photo: Gabrielle Robinson)

August 2019 Obituaries

by **Christine T Kato**
August 01, 2019

Sincere sympathy is extended to the families of:

Thomas Carr, member of technical staff, hired April 5, 1965, retired April 1, 1986, died July 16, 2019
Joseph Glowacki, member of administrative staff, hired June 8, 1998, died July 6, 2019
Lester Hackathorn, office of technical support, hired March 23, 1964, retired April 1, 1993, died June 19, 2019
John Kleissas, member of technical staff, hired April 3, 1961, retired Nov. 1, 1975, died Sept. 18, 2018
Robert McCoy, office of technical support, hired Aug. 18, 1966, retired Nov. 1, 1988, died May 16, 2019
Richard Moore, office of technical support, hired June 12, 1961, retired Dec. 1, 1990, died July 18, 2019
James Murrell, member of technical staff, hired March 7, 1983, retired Sept. 1, 2005, died July 9, 2019
Charles Shaffer, office of technical support, hired July 3, 1967, retired Oct. 1, 2003, died Aug. 23, 2018
Kenneth Shogren, member of technical staff, hired May 15, 1962, retired Oct. 1, 1986, died July 24, 2019

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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