National Aeronautics and Space Administration
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2018

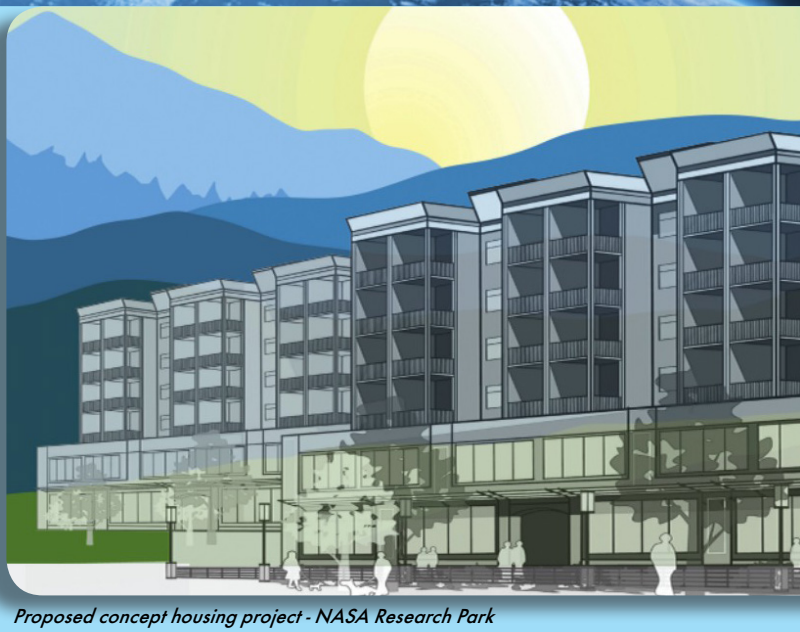
NASA Selects Lessee for Silicon Valley Housing Development

Ames Research Center 1st June 2018

NASA has selected Mountain View Housing Ventures, LLC, an affiliate of CRC Partners LLC, as the preferred selected lessee to develop housing on NASA property in Moffett Field, California. NASA and the U.S General Services Administration posted a development opportunity in October 2017, requesting proposals to construct and operate a minimum of 1,930 housing units on 46 acres of federal property. NASA will begin negotiations with the selected organization in order to establish a long-term lease under its enhanced use lease authority.

With a severe shortage of housing across the Bay Area, NASA Ames is looking to use this development as an opportunity to provide housing for those who work or go to school on the NASA property.

"We are looking forward to doing our part to help mitigate traffic and provide housing for the community," said Ames Associate Center Director Deborah Feng. "Partnering with industry, academia and other organizations has afforded us with unique opportunities to advance our mission here at NASA Ames."



Proposed concept housing project - NASA Research Park

"I think [working with engineers from various majors] is one of my favorite parts of this project."

Devin Gund, Senior, Electrical and Computer Engineering, Carnegie Mellon University

CMU Team in NASA Mars Ice Drilling Competition

By F. Forney April 25th 2018

Space exploration is no simple task. As astronauts look to neighboring planets for expeditions, they need to consider all the resources available to them, such as the large subterranean ice deposits under Mars' crust. This untapped water could serve as fuel for a lengthy return trip to Earth, but first, we need a way to harvest it.

Such is the challenge issued by NASA this year. A team of undergraduate engineering students from Carnegie Mellon will design and construct a prototype robot that can extract ice from a simulated Martian landscape. They are one of 10 finalist teams.

The Tartan Ice Drilling System (TIDS) team is comprised of 15 students spanning various majors in the College of Engineering. The team is advised by Mechanical Engineering (MechE) Professor Aaron Johnson who shares his expertise in robomechanics with them. Ph.D. candidate Catherine Pavlov also advises the team, drawing from her previous research experience at NASA.

Continued on page 6

IN THIS ISSUE

NRP Welcomes

Metis Technology Solutions, Inc

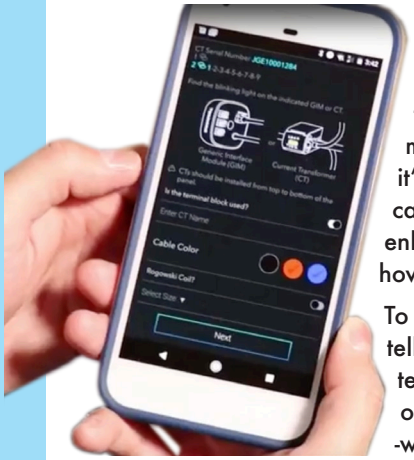
Bldg. 19, Room 1070M
Commencement Date: 15th May 2018

Metis

Founded by Joy Colucci, PhD, Metis Technology Solutions excels in providing science and engineering services to the Federal agencies including NASA. They have extensive experience working with spaceflight systems, ground systems, scientific computing facility development and operations, and data analytics. Some of the top programs for which Metis is providing exceptional assistance are: NASA Aviation Safety Reporting System (ASRS); SimLabs, Synchronized Position Hold Engage Reorient Experimental Satellites (SPHERES) and the Ames Mission Design Center. Metis previously provided outstanding support for the Lunar Atmosphere and Dust Environment Explorer (LADEE) mission as flight dynamics lead. Metis is presently supporting the Heliophysics swarm-satellite proposal effort and has received several prominent NASA awards and accolades, including the 2017 NASA Agency-wide Small Business Subcontractor of the Year.

Orange Silicon Valley Discovers 4X Savings with Verdigris

Moffett Field, CA May 2018



Some people are skeptical that energy transparency alone can help them save money. After all, having access to energy data is only the beginning. You need to be able to interpret the data, then enact energy saving measures, behavior change, or equipment retrofits. For many, it's just another data point in an already noisy ecosystem and can quickly turn into a cost center rather than a bottom line enhancer. But now more than ever, companies are learning how easy it can be to use energy data to drive costs down.

To show you how it's done, I want to share a quick video that tells the story of Orange IoT Studio, a subsidiary of the French telecom company Orange. In this case study, we share some of the ways Orange IoT Studio uses Verdigris, including how--within weeks of installing Verdigris--they were able to identify $40K worth of savings. This is just one way our customers are finding value with their Verdigris systems and I hope it'll give you some cool ideas on how you can get the most out of your new energy management solution.

"You're likely to learn surprising things once you start digging into the data, things that go straight to the bottom line, and this was certainly the case for us. Verdigris has been a great partner and we can't wait to see what they come out with in the future."

Scott Dworkis, Infrastructure Engineer, Orange Silicon Valley

Made In Space Wins NASA Contract for Next-Gen 'Vulcan' Manufacturing System

MOFFETT FIELD, CA 7th May 2018

Made In Space (MIS), the company that has manufactured over 100 polymer parts in space with its additive manufacturing systems, has been selected for a NASA contract to further develop its next-generation metal space manufacturing system known as VULCAN.

The VULCAN system will fabricate precision parts made of aerospace-grade metals such as titanium and aluminum, as well as high-grade polymers and hybrid components that combines multiple materials. It will have the capability to manufacture parts that require the strength and durability of aerospace-grade materials, such as housings for life support systems, that couldn't be made with any current systems.

"The VULCAN hybrid manufacturing system allows for flexible augmentation and creation of metallic components on-demand with high precision," said Mike Snyder, MIS chief engineer and principal investigator. "VULCAN is an efficient, safe capability that utilizes the minimum amount of resources during manufacturing processes."

After a successful completion of a Phase I SBIR contract, VULCAN was recently selected for a NASA Phase II Small Business Innovation Research (SBIR) award. Expanding on MIS's successful development and operation of multiple manufacturing systems on the International Space Station (ISS) with NASA's Marshall Space Flight Center, the technology is being developed for a demonstration on the ISS to prove this capability's usefulness in future human spaceflight operations, such as aboard the Lunar Orbiting Platform Gateway.

"The VULCAN hybrid manufacturing system allows for flexible augmentation and creation of metallic components on-demand with high precision,"

Mike Snyder, MIS chief engineer and principal investigator

"VULCAN can be important to logistical reduction necessary for long-term exploration," said Snyder. "The hybrid manufacturing system is a major step forward for efficient space operations, providing the ability to build essential components and assemblies in the space environment, where flying spare parts from Earth are otherwise not viable."

VULCAN will be the first of its kind to bring machined parts to space, enabling a multitude of more critical parts to be manufactured off world. The system's hybrid technique utilizes both additive manufacturing to create the desired near net shaped part and traditional manufacturing methods to machine down and create the finished product. The unique system manufactures, refines, and performs

quality checks in a streamlined, automated process, eliminating the need for a human in the loop during manufacturing.

VULCAN enables fabrication of precisely-machined metal parts at the point-of-use, such as on the ISS or future crewed space platforms. This technology combines spaceflight proven hardware, a unique manufacturing head for metals, and an integrated sensor system to produce ready-to-use parts for on-orbit use. VULCAN builds on fused deposition modeling, the current method of additive manufacturing employed by MIS's in-space systems.

VULCAN is engineered to be versatile and upgradeable. Deriving technology from MIS's flight-proven systems found in its Additive Manufacturing Facility (AMF), VULCAN has the ability to exchange different machining tools on-demand and can be upgraded over time to meet additional NASA and commercial spaceflight needs.

Over thirty materials are compatible with VULCAN to manufacture parts, including high-performance thermoplastics composites, titanium, aluminum, and stainless steel. The metal parts will be built within the limited power constraints of orbiting spacecraft and space stations.

VULCAN's origin is linked to Archinaut, MIS's in-space robotic additive manufacturing, assembly and repair technology. Archinaut is being built to manufacture in the extreme environment of space, with additive manufacturing at the system's core. Both devices have autonomous robotic capabilities built in. This summer, MIS is completing ground testing and conducting thermal vacuum testing of the entire Archinaut platform.

"We're very thankful for NASA and Marshall Space Flight Center (MSFC) for supporting our shared vision and allowing us to build upon our expertise of manufacturing on-orbit," said Snyder.

CMU's Foosteps to Preventing Falls

By Alexandra George Moffett Field, Carnegie Mellon Silicon Valley 2018

Sensors developed by researchers at Carnegie Mellon predict when a patient will fall.

One of four elderly persons falls every year in the United States. With more than 37 million hospitalizations every year, roughly one million falls occur in hospitals and can lead to serious injury and even death. Patients often fall while trying to get out of bed or when they walk for longer than they are able. Nurses can't constantly monitor individual patients because of the number of patients they attend to. Sensors can continuously monitor patients, but many only detect the fall as it happens without leaving enough time for a nurse to intervene.

Civil and environmental engineering Professor Hae Young Noh is developing sensors that predict when a person is about to fall by sensing the vibrations from a person's movement. Using signal processing and machine learning, her sensors detect the movement of a person and characterize what those movements mean: if they will exit the bed, if they will take another step, and if they will fall.

Unlike other sensors that monitor patient movement or vital signs, Noh's sensors identify the intent of a person's movements—whether they are preparing to exit the bed or just rolling over and sitting up. These sensors, placed on the bed frame, will then alert the nurse when it predicts that a patient may be getting up, so the nurse can get to the patient in time.

Source: Hae Young Noh
The sensor attaches to the end or side of the bed.

"If a sensor can pick up [symptoms] and notify the caregivers, families, or doctors, it could help with prevention and treatment."

Hae Young Noh, Professor, Civil and Environmental Engineering, Carnegie Mellon University

Just like a pebble creates waves when dropped into water, our movement and contact with objects also create waves that a sensor can detect. The sensors contain accelerometers that detect wave signals that propagate through the bed frame. They utilize signal processing methods and machine learning techniques to classify the vibration, determining whether the patient has an intent to exit or not.

Highly accurate and highly sensitive, the sensors are also placed on the floor to detect when a person's gait, or manner of walking, is deteriorating.

"Some people can only walk about 10 steps," said Noh. "And they used to be healthy, so they are going to try to take the 11th step. Because it's over their limit, the risk for a fall increases, and it shows in the gait deterioration pattern before it actually happens. We're trying to detect that pattern."

The sensors can locate each footstep with less than 0.34 meter of error, about the

Continued on page 9

Boeing Invests in Global Learning and Innovation Institute Singularity University

Press Release PR Newswire, February 15th 2018

Boeing [NYSE: BA] announced its investment in Mountain View, Calif.-based Singularity University (SU), an immersive and digital educational program provider, business accelerator, and global online community furthering the application of exponential technologies, including artificial intelligence, augmented and virtual reality, nanotech fabrication and robotics.

Boeing and SU will explore opportunities to work together, which could include customized educational programs for Boeing employees and the addition of Boeing technical experts to SU's faculty. The investment represents Boeing's commitment to furthering its digital transformation in its second century.

"Curiosity and innovation are at the core of who we are and what we do at Boeing," said Bethany Tate Cornell, vice president, Leadership, Learning and Organizational Capability. "SU shares our commitment to continuous learning that empowers people to solve complex, global challenges; and their work with transformative technologies represent potential game changers in the way we develop as individuals and work together as teams."

SU builds capability in individuals and organizations to learn, connect and innovate breakthrough solutions by teaching them how to use accelerating technologies like artificial intelligence, robotics and digital biology. Its global community spans more than 100 countries and includes entrepreneurs, corporations, development organizations, governments, investors and academic institutions. SU provides education offerings led by world-renowned experts and targeted corporate training programs for emerging and established leaders.

"Boeing's commitment to continuous learning and innovation aligns with SU's mission to educate individuals and organizations globally on how to use exponential technologies to tackle humanity's grand challenges," said SU's CEO, Rob Nail. "At SU, we see that the world's biggest problems are also often the biggest business opportunities, so we are extremely excited to partner with companies like Boeing that have the capabilities to make a true difference at scale."

Boeing HorizonX Ventures partnered with WestRiver Group to lead the Series B investment round. Cornell will represent Boeing on the SU board of directors.

Source: Singularity University
Singularity University CEO Rob Nail

A certified benefit corporation, SU was founded in 2008 by Ray Kurzweiland Peter H. Diamandis, and is partnered with leading corporations and nonprofit organizations. SU is headquartered at NASA Research Park in Silicon Valley.

Chicago-based Boeing is the world's largest aerospace company and leading manufacturer of commercial jetliners and defense, space and security systems. A top U.S. exporter, the company supports airlines and U.S. and allied government customers in 150 countries.

INTERESTING PODCASTS

These podcasts can be found on www.nasa.gov

Ian Brosnan and Colin Williams Talk About the USGS Moving to NASA Ames

Feb. 16, 2018 - A conversation with Ian Brosnan from NASA and Colin Williams from the USGS. This is the first episode of a mini-series about NASA and USGS collaboration. To hear more from Ian Brosnan, listen to his previous NASA in Silicon Valley episode, Ian Brosnan Talks About How NASA Collaborates and Shares Data with Other Agencies.

Chad Frost and Susan De La Cruz on the "Social Networks" of Wildlife

Feb. 23, 2018 - A conversation with Chad Frost from NASA and Susan De La Cruz from the USGS. This is the second episode of a mini-series about NASA and USGS collaboration. In this episode they focus on tracking wildlife and what that information can tell us about the social networks between animals.

Chris McKay and Ron Oremland, Ocean Worlds and the Search for Life

March 1, 2018 - A conversation with Chris McKay from NASA and Ronald Oremland from the U.S. Geological Survey about ocean worlds and the search for life. This is the third episode of a mini-series about NASA and USGS collaboration.

NASA and the USGS, a Shared History in Remote Sensing

April 23, 2018 - A conversation with Jim Brass, Bruce Coffland from NASA and Susan Benjamin USGS director of the Western Geographic Science Center. They discuss the shared history between NASA and the USGS in remote sensing.

Mars Ice Drilling CMU, continued from page 1

Five of the students serve as project leads in four subgroups that are essential to the success of the ice drilling robot. The goal is to drill for ice mostly autonomously. Although the robot is demoing on Earth, the team will also need to know how to tweak it should it actually get sent to Mars.

Paula Zubiri, a junior in MechE, oversees the structure of the robot and the XYZ position system. She ensures that the drilling mechanism does not overpower the body of the machine and cause it to unwind itself while drilling.

"A lot of my MechE background deals with analysis of, not just structures, but how different objects interact," says Zubiri. "We're going to be dealing with a drill rotating at really high velocity and really high torque in the middle our system."

Source: CMU TIDS team
Members of the Tartan Ice Drilling System Team

Devin Gund and Christina Ou are a senior and junior in Electrical & Computing Engineering (ECE) respectively. They lead the controls subgroup which handles the software of the robot. Because autonomy is an important goal of the project, the robot will need to sense where the drill should penetrate the ground, how deep, and at what speed.

"We're looking at all the environmental data from sensors and then controlling the rest of the machinery appropriately," says Gund. "ECE is the perfect background for that because it's just a mix of hardware and software."

Tim Cote, a senior in Materials Science & Engineering (MSE), is in charge of the drill subgroup and the careful selection of metals for its construction. The team walks a fine line of needing to make everything as light as possible for space travel efficiency but as strong as possible to withstand extreme speeds, forces, and temperatures.

"We will be working in the new hands-on maker space [The Tech Spark] that they created in Hamerschlag."

Caroline Morin, Senior, Chemical Engineering & Biomedical Engineering
Carnegie Mellon University

Cote explains that "in materials science, engineers need to maximize all the different properties that you want to get the best material for the job.... I can't just throw a huge steel bar up on Mars because it's too heavy."

Caroline Morin, a senior studying Chemical Engineering and Biomedical Engineering, oversees the subgroup for water extraction and purification. They need to account for temperature and pressure to manipulate ice, water, or vapor at certain points in their process. They want to thermally distill the ice without having it sublimate—rapidly change from solid to gas.

"You don't just have somebody up there who can change... membranes," Morin explains, reemphasizing the robot's need for autonomy since astronauts will not be available to change out replaceable parts, such as membranes or filters. "We will vaporize the water and then re-condense it so that we are able to fully separate it from all minerals."

"I think [working with engineers from various majors] is one of my favorite parts of this project."

Devin Gund, Senior, Electrical and Computer Engineering, Carnegie Mellon University

The TIDS team is bolstered by support from Carnegie Mellon faculty and staff in the form of mentor-ship, funding management, and access to cutting edge work spaces.

"CMU has been really helpful with the whole process.... Because we are a student project, we will be working in the new hands-on maker space that they created in Hamerschlag," Morin remarked, referring to The Tech Spark, the maker space on the C-level of Hamerschlag Hall that has served as the TIDS team's base of operations.

The team came together from separate programs and classes due to a common love for space technology. "The amount of challenges that need to be overcome to achieve these amazing things, it just blows me away every time," Cote said, reflecting on what first got him interested in the project. Zubiri added that, "the idea is that you don't waste anything. It's sustainable on a spaceship. That's like my MechE mind thinking how to make everything efficient."

"I think [working with engineers from various majors] is one of my favorite parts of this project," Gund added. "It's really just cool and impressive to be working with people outside of my field of study that know things that I don't. I really enjoy that." In addition to the subgroup leads, these people include engineering students Jordan Aaron, Simone Hugh Sam, Thor Mercier, Emily Newman, Cesar Quinones, Andres Ramirez, Nikki Scavone, Joe Taylor, Kam Undieh, and Boyao Yu.

The members of the Tartan Ice Drilling System team will compete at the final demo day for NASA's RASC-AL Challenge June 5 - 7. Learn more or support the team in their efforts by visiting their website: cmumarsice.com.

Boreal Space and Stanford University XLAB Join Forces to Demo a Sensor Capable of Exploring Exceptionally Extreme Space Environments

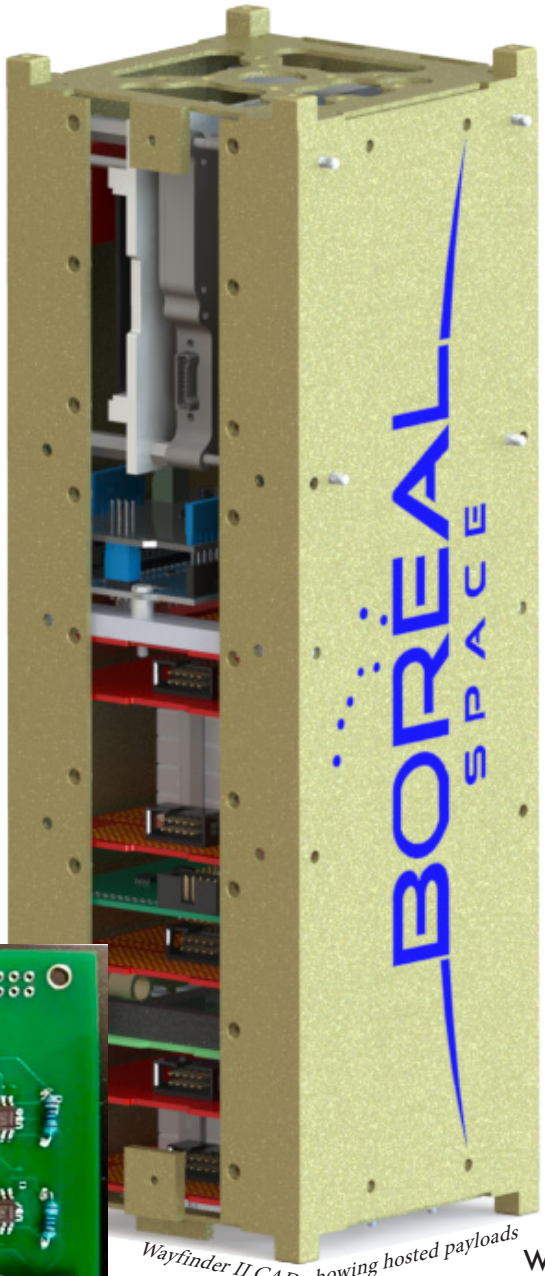
By Devin Graham, Boreal Space May 18th 2018

Space is a beautiful but hostile environment, containing moons with frozen oceans and planets with atmospheres where temperatures can reach more than 800 degrees Fahrenheit. Spacecraft exploring these regions encounter problems with conventional silicon-based electronics, revealing that these components are not well suited for long-term space operations. Malfunctions due to heat and cold sensitivity and other environmental issues are common. We need to create new devices that are up to the task. Exciting alternatives to silicon, known as wide bandgap semiconductor devices, are being developed for operation in environments that experience high levels of radiation and cryogenic temperatures.

Stanford University's EXtreme Environment Microsystems Laboratory or XLab, led by Professor Debbie Senesky (xlab.stanford.edu), is conducting groundbreaking research in this area, focusing on "the development of micro- and nano-systems for operation within extreme harsh environments". The Stanford team, known as "Team Extreme", uses a microfabrication process to create magnetic sensors based on Gallium Nitride, which may revolutionize future space missions into extreme environments.

A NASA Research Park industry partner, Boreal Space, led by Barbara Plante, has joined with Team Extreme to raise the flight Technology Readiness Level (TRL) of the XLab magnetic sensor.

Boreal Space designs and creates Cubesats providing scalable, low cost hosted payload space for research and commercial applications. Team Extreme was offered space on Wayfinder II, a 3U Cubesat (Figure 1), which has a suborbital launch opportunity scheduled with launch provider Interorbital Systems.



Wayfinder II CAD showing hosted payloads

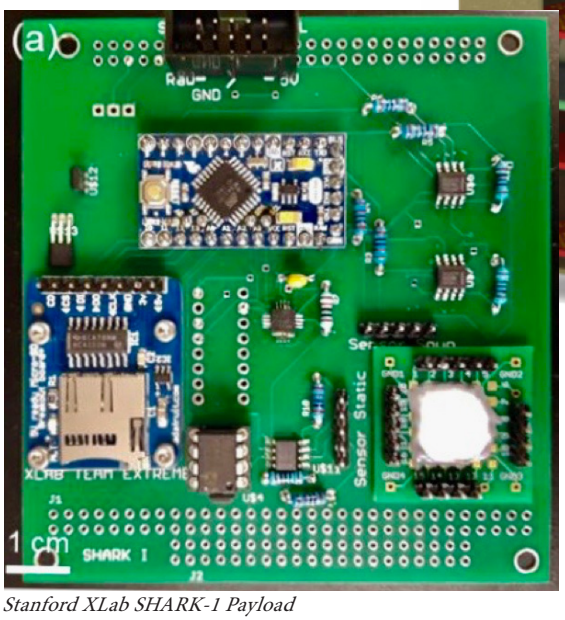
Boreal Space's engineering team collaborated with Team Extreme to specify payload hardware and software interfaces to the Wayfinder spacecraft. The XLab SHARK-1 payload (Figure 2) was integrated into the Wayfinder and tested at the Boreal Space lab in NRP Building 19.

In addition to hosting the SHARK-1 experiment, Wayfinder II is providing payload space to the National University of Singapore for a materials experiment and to Team Hakuto (iSpace) for their robotics experiment. RF communications during the suborbital flight will be provided by the Spacelink Duo UHF radio, commissioned by Boreal Space and provided by Space Inventor, Aalborg, Denmark.

Wayfinder II is scheduled to launch later this year on the Interorbital Systems Neptune launch vehicle in the Mojave Desert, CA. The Boreal Space Launch Team will provide on-site support for the final launch vehicle integration and suborbital launch. During the flight, Wayfinder II on-board instrumentation will record sensor data and provide important insights, such as launch load survival and signal integrity, for the hosted payloads.

Launch opportunities such as the Wayfinder II campaign, pave the way for low TRL experiments to be readily tested in space and launch conditions, bringing future technologies to space exploration at a rapid pace through the use of CubeSats.

www.borealspace.com



Stanford XLab SHARK-1 Payload

Bob Vermillion of RMV receives James A. Russell Lifetime Achievement Award

Tobyhanna Army Depot 9th May 2018

The National, Institute of Packaging, Handling and Logistics Engineers (NIPHLE) consisting of the US Army, US NAVY, USMC, DLA, USAF, DCMA and Industry, honored Bob Vermillion, CPP, Fellow, RMV Technology Group, LLC (RMV) with the James A. Russell Award, the highest recognition given each year by NIPHLE to recognize the Lifetime Achievement to a member for advancements and innovations in the field of Packaging Engineering for protection of the Warfighter. In 2015, RMV at NASA Ames, received the NIPHLE Corporate Award in support of the Warfighter.

Earlier in his corporate career, Vermillion developed a static shielding MX Missile Shroud and later assisted in the development of a CDM safe electrostatic discharge shielding paperboard technology that is today widely utilized in aerospace & defense and the commercial sector. Shortly thereafter, Vermillion invented (Patent# 5,637,377) a Protective Containerboard for Electrostatic Discharge Sensitive Devices. Later, he pioneered several other materials that exhibited superior shielding and charge mitigation properties. In 1996, Vermillion assisted the Pentium II Packaging Development Team in design of a package that successfully survived high voltage discharges in transport before the product was launched. To understand the risk of corrugated containerboard Triboelectrification (charging) during air transport, winter and Santa Ana Wind conditions, Bob is the First to map differences between charge levels of Asia Pacific Cylinder Paperboard versus Fourdrinier linerboard used in the Americas, Europe and the United Kingdom at various relative humidity levels.

In 1998, Vermillion provided SME evaluation training for the Inherently Conductive Polymer (ICP) Scientists, including a Nobel Laureate in Chemistry. In 1999, one of Bob's developments was NASA Mars Mission Approved, In 2002, using one of Bob Vermillion's developments and a new ICP Technology, a corrosion free ESD shielding tamper proof long-term storage package design placed 1st in the Institute of Packaging Professionals 2002 Ameristar Award competition for the USA. Vermillion's efforts in R&D have led to developments with high performance liners, numerous material reformulations and proprietary Trade Secret Vermillion Testing Methods for Triboelectrification prelaunch testing for ESD integrity on a Lunar or Mars environment. Another of Bob's Trade Secret ground breaking advancements constitutes shake down testing for touch displays, electronic flight helmets and hand-held devices, ESD sensitive wearables and Small Satellites (CubeSats).

At the NASA Quality Leadership Forum (QLF) 2010, Vermillion was the First to Present and Publish on Suspect Counterfeit ESD & Packaging Materials in the Aerospace & Defense Supply Chain. Bob's efforts have led to the implementation of countermeasures by the largest electronic corporations in the USA, the US Army DAC, NASA, DOE, NAVAIR and Space Science Laboratories at UC Berkeley. This led to RMV training offered by DOE, Cal Poly, Oxford, CALCE and Loyola University, to name a few.

When the USMC needed to insure protection of successful mountaineering equipment for deployment to Afghanistan, Vermillion accepted the challenge and redesigned the package and recommended RFID tracking. Vermillion published a paper on ESD issues with RFIDs and packaging. When a prime required UAV protocols for NAVAIR deployment compliance, Vermillion's team received an Outstanding Past Performance. Vermillion has been a Featured Speaker on Suspect Counterfeit Packaging & Materials for GIDEP since 2016. Upon recommendation by NASA-MSFC, Bob presented at the NASA Academy of Aerospace Quality (AAQ) on test methods of ESD packaging for successful CubeSat deployment in cooperation with the Auburn University School of Engineering in 2016 and again in 2017. Thereafter, Bob was asked to join the NASA/Auburn AAQ group as an Expert Adviser. In 2018, Bob presented at the NASA QLF, Cape Canaveral upon invitation by NASA HQ.

Today, antistatic migration is on the rise and poses major long-term storage issues; Bob has conducted several internal studies using accelerated aging tests to benchmark the associated risks. Due to the influx of unvetted products from offshore, the contamination of sensitive electronic components poses a major risk due to nonconforming antistatic packaging.

As the NASA ESD Technical Authority and working member of the Interagency Working Group (IAWG-ESD), Vermillion leads an ESD Aerospace Materials & Packaging Test Laboratory and Training Center at NASA Ames Research Center. RMV provides testing support for NASA, DLA, and many of the Fortune 500 electronics organizations. Most recently, Vermillion has developed proper ESD testing protocols for Satellite Shrouds which have a large footprint.

Please visit RMV, a NASA Industry partner and SDVOSB high tech engineering firm at www.esdrmv.com. For more information, please contact Bob at bob@esdrmv.com or Renee Mitchell at renee@esdrmv.com.

You can also visit RMV at www.esdaerospacetraining.org. Also, please visit www.esdaerospacetraining.org

Footsteps, continued from page 4

size of a foot, which allows them to detect walking speed, stride length, and step frequency—factors related to predicting fall risk. The system can also estimate individual footstep forces and left-right balance of footstep forces within 5% error of body weight. The sensors can even use the vibrational signals to detect mood, because behavioral patterns suggest how people feel.

The team will soon deploy the sensors in hospitals for testing. In the future, the sensors can be used for various applications, such as animal sensing and studying gait deterioration in different populations including children and those who have genetic diseases that affect their muscle function and walking ability. Ph.D. students Mostafa Mirshekari, Jonathon Fagert, and Shijia Pan, as well as electrical and computer engineering Professor Pei Zhang also collaborate on the hospital bed sensors project.

"Patients may be too shy and don't want to worry others," says Noh, "But information about their symptoms is sometimes critical. So, if a sensor can pick them up and notify the caregivers, families, or doctors, it could help with prevention and treatment."

For media inquiries, contact
Alexandra George at amgeorge@andrew.cmu.edu

Medal of Honor on Display at Moffett Museum

Moffett Field, California 2018

Over two years ago, MFHS President Herb Parsons started an effort to procure a duplicate Medal of Honor for RADM William A. Moffett's venue in the museum. After many discussions, the Historical Society's request was first sent to RADM Jerry MacKay, a member of our Advisory Board. He passed it on to ADM Harry Harris, who was the Commander, U. S. Pacific Fleet at the time. That endorsement was instrumental in our obtaining approval for a duplicate medal. However, the bureau in the Pentagon did not have a medal to send us and we had to wait until they could procure additional medals.

Recently, that same ADM Harris, now the Commander Pacific Command, was in Washington, D.C. and a member of his staff picked up the medal. Admiral Harris was in the Bay area for meetings at the Naval Postgraduate School and the Hoover Institute at Stanford. He delivered the medal to Rear Admiral MacKay. Admiral MacKay then turned over the medal to Herb Parsons. The medal is now displayed in the Moffett Museum. Visitors have the unique opportunity to see a Medal of Honor and the Citation up close.

Made In Space to Bid on Phase II of Archinaut Development Program

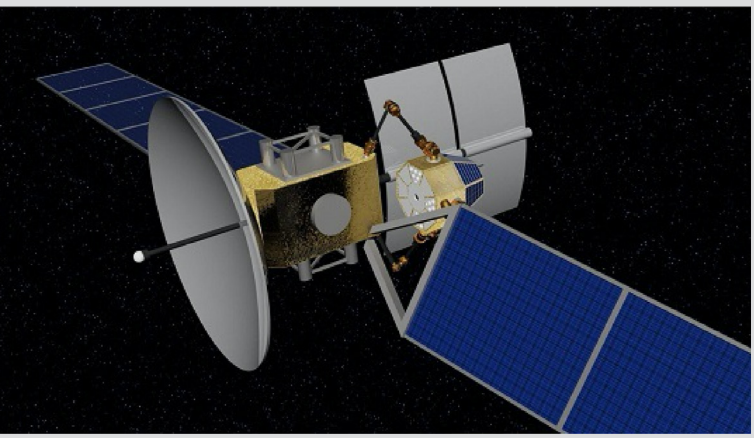
MOFFETT FIELD, California, 17th May, 2018

NASA has invited Made In Space, Inc. (MIS) to submit a proposal for a technology flight demonstration mission (Phase II) of its Archinaut technology. Archinaut is an in-space robotic manufacturing and assembly platform capable of constructing space-optimized systems of sizes not previously feasible. NASA's Space Technology and Mission Directorate (STMD) awarded MIS its initial Archinaut contract in 2016. Since that time, MIS has made significant advancements in space-capable extended structure additive manufacturing and robotic assembly.

"Archinaut is a transformational capability that supports space exploration and other critical in-space missions for a variety of customers,"

Andrew Rush, MIS president & CEO

"Archinaut is a transformational capability that supports space exploration and other critical in-space missions for a variety of customers," said Andrew Rush, MIS president & CEO. "This technology enables us to build space-optimized structures in space . What this means is we can now build larger and bigger structures that can deliver greater capabilities at a much lower cost and with less risk."



Archinaut servicing satellite (Credit: Made in Space)

Archinaut was initially awarded under STMD's Tipping Point program, which was established to fund public-private partnerships to achieve NASA's goals of expanding space capabilities and helping develop next-generation technologies to grow the U.S. economy and strengthen the nation's economic competitiveness. The Tipping Point program funds technology development until the point of maturation where commercial companies take over, buying products and supporting for further capability development.

"NASA is ushering in a new era of manufacturing and assembly technologies for space," added Rush. "The Archinaut technology that we're advancing provides considerable, never-seen-before capabilities for NASA, commercial, and other government customers. We're pleased with our progress in assembling a world-class team with tremendous technical expertise to compete for Phase II work."

MIS's team includes Northrop Grumman for systems integration and avionics work and Oceaneering for robotics capabilities.

The core technology of Archinaut is the Extended Structure Additive Manufacturing Machine, or ESAMM. ESAMM is an additive manufacturing capability that enables manufacturing of large structures not limited by traditional build volumes. MIS proved out the transformational ESAMM capability in the summer of 2017 during thermal vacuum testing at NASA Ames Research Center. Since then, MIS has been developing ESAMM-based flight mission architectures for a variety of commercial and government customers.

"We're preparing for an important thermal vacuum chamber test of the entire manufacturing and assembly system this summer," said Eric Joyce, Archinaut project manager. "We've made considerable progress in raising the technology readiness level and lowering the risk associated with bringing this technology to space."

MIS is working with high-strength space-grade polymers, such as PEI/PC ULTEM (polyetherimide/ polycarbonate) , on its Archinaut technology and, is developing metal capabilities for missions which require metallic properties.

Archinaut has helped MIS win several industry and customer accolades. Most recently, MIS won Johnson Space Center's Small Business Prime Contractor of the Year Award for accomplishments with the company's Additive Manufacturing Facility operating onboard the International Space Station and project management of other key programs such as Archinaut. Last year, MIS received Guinness Book of World Record for the longest continually 3D printed structure at 37 meters. In February 2017, Fast Company named Made In Space No.5 on its Most Innovative Companies List, and, in March 2017, Made In Space won a silver Edison Award for Archinaut for space-flight innovation and manufacturing.

About Made In Space :

Made In Space, Inc. is the world's most experienced in-space manufacturing company. Established in 2010 and with offices in Florida, California, Alabama and Ohio, Made In Space leverages the unique properties of the space environment to develop manufacturing solutions to commercial, industrial, research and defense challenges. Archinaut, one of Made In Space' flagship programs, enables in-space production and assembly of the backbone structures for large telescopes, repair, augmentation, or repurposing of existing spacecraft, and unmanned assembly of new space stations. The company's vision is to enable the future of space exploration by offering off-Earth manufacturing capabilities.

For more information about

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Rosenberg Is on a Mission at CMU's Silicon Valley Campus

By Allison Hodson Moffett Field, California, , 1st June, 2018

As a child, Steven Rosenberg avidly read books on astronomy and the history of the cosmos. Today, his travels in space continue at the NASA Ames Research Park in Mountain View, California, as senior director of operations for CMU's Silicon Valley campus.

"After being at a Fortune 50 company, it was really nice to rejoin the CMU community and return to working alongside our talented faculty and students."

Steve Rosenberg, Senior Director of Operations for CMU

"It's a very dynamic and exciting place to be," said Rosenberg, who connects CMU researchers with NASA scientists to work on projects, such as building smart habitats for missions to the moon and Mars.

In addition to supporting space missions, Rosenberg helps keep the campus running smoothly by ensuring the students, faculty and staff have what they need, from overseeing IT support and classroom renovations to preparing the campus's accreditation report for the College of Engineering, the campus's home school. He is a manager, strategist and liaison for CMU's partnerships in Silicon Valley and Pittsburgh.

Rosenberg enjoys the entrepreneurial spirit at CMU Silicon Valley, where the global tech scene plays a major role in the academic experience. Google, Apple and Facebook headquarters are a few miles from campus, where each year more than 330 master's degree and Ph.D. students specialize in areas of study including software, cybersecurity and entrepreneurship.

"Tech has a big impact on the university culture here. Students have ample opportunities to interact with leading companies both in and outside of the classroom," he said.

Rosenberg earned his master's degree and Ph.D. in cognitive psychology at CMU, studying under Nobel laureate Herbert Simon. After earning his doctorate, he had an extensive 29-year career at Hewlett Packard Laboratories, managing research and launching partner labs with several top-tier universities. He joined the Silicon Valley campus in 2009 as a visiting scientist.

"It was refreshing to come back to a university setting," Rosenberg said. "After being at a Fortune 50 company, it was really nice to rejoin the CMU community and return to working alongside our talented faculty and students."

When he's not at campus, Rosenberg enjoys hiking with this family and practicing magic.

"As a cognitive scientist, I am always interested in how people think," Rosenberg said. "I find it fascinating how simple magic tricks shed light on how we perceive and understand. It's both fun and illuminating to fool people by 'tricking' their perceptions and understanding."

Carnegie Mellon University

NASA Photo Ops

NRP Deputy Director provided a briefing and tour to the UK IT companies, May 24, 2018

On April 17, 2018 Dr. Eugene Tu, NASA Ames Director welcomes Dr. David Applegate, USGS Acting Deputy Director

Intrinsyx Technologies received the 2017 NASA Small Business Subcontractor of the Year Award for Ames Research Center

Bldg. 19 2nd floor Tenant Improvement Project with USGS Leadership Team

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