

## Messages from NASA Administrator Charles Bolden

### Please Welcome Deputy Administrator Dava Newman



NASA Deputy Administrator Dr. Dava Newman walks to a meeting with NASA Administrator Charles Bolden, on Monday, May 18, 2015, her first day on the job at NASA Headquarters in Washington. Photo Credit: NASA/Bill Ingalls.

Please join me in welcoming Deputy Administrator Dava Newman to NASA! Dr. Newman took her Oath of Office on Friday, and today is her first full day on the job.

On a personal note, I have known and admired Dava for several decades. Her talents and skills as an educator and technological innovator will bring a new energy to our NASA leadership team, and I'm ecstatic to have her on board.

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### Announcement of New Center Director

I am pleased to announce the selection of Dr. Eugene L. Tu as the next Director of NASA's Ames Research Center at Moffett Field, California. The appointment is effective immediately.

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Dr. Eugene L. Tu, the new Director of Ames Research Center. Photo Credit: NASA, Dominic Hart.

## Selection of NASA Ames Research Center Deputy Center Director: A Message from Eugene Tu, Center Director



Dr. Thomas A. Edwards, New Deputy Center Director. Photo credit: NASA

It is with great pleasure that I announce the selection of Dr. Thomas A. Edwards as the NASA Ames Research Center Deputy Center Director effective Monday, May 18, 2015. I am very excited to have Tom join me in this new capacity as we take our center into the future.

Dr. Edwards began his career with NASA in 1983, and has served in a variety of research and managerial assignments in fields including computational fluid dynamics, aircraft

design, aerothermodynamics, information technology and aviation operations. He is a graduate of Princeton University, with Master's and PhD degrees in aeronautics and astronautics from Stanford University. As a Sloan Fellow, he holds a Master of Science in Management from the Stanford Graduate School of Business.

Dr. Edwards was recently the Director of Aeronautics at NASA Ames Research Center, with responsibility for research in aviation operations, flight vehicle technology and design and fundamental aerodynamics. He was responsible for the operation of national flight simulation and wind tunnel facilities. Dr. Edwards also is a Fellow of the American Institute of Aeronautics and Astronautics.

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# NRP WELCOMES

## Alidyne

**Location:** Building 19 Floor 2, Room 2006

**Commencement:** 15<sup>th</sup> March, 2015

Alidyne's mission focus is embedded systems, signal processing/design, modeling environments and spaces and spacecraft design engineering. It's R&D efforts at Ames will be applicable to small spacecraft, cube sats, ISS payload support and robotic sensing design. Alidyne has been an R&D partner of NASA through its support of ISS missions since 2011 and will continue to further partnership opportunities.



## Teton Aerospace, LLC

**Location:** Building 19 Floor 1, Room 1070C

**Commencement:** 1<sup>st</sup> April, 2015

Prof Bob Twiggs, Co-Founder and President and a professor of Astronautical Engineering at Morehead SU, helped develop the original concepts for the CricketSat, CanSat, CubeSat and the PocketQube for educational applications for use in Space, and was selected by Space News in 2010 as one of the 10 space professionals "That made a difference in space". Teton Aerospace' vision is to demonstrate a new more flexible, low cost, rapid development methodology for space scientists and spacecraft engineers. They plan to capitalize on the 3D printing experience, the long term accomplishments with the development, launch and operation of CubeSats and the new FemtoSat flight demonstration using PocketQubes.



## NASA Research Park Wins Bright Idea Award

Source: Charles S. Clark, Government Executive  
19<sup>th</sup> February 2015

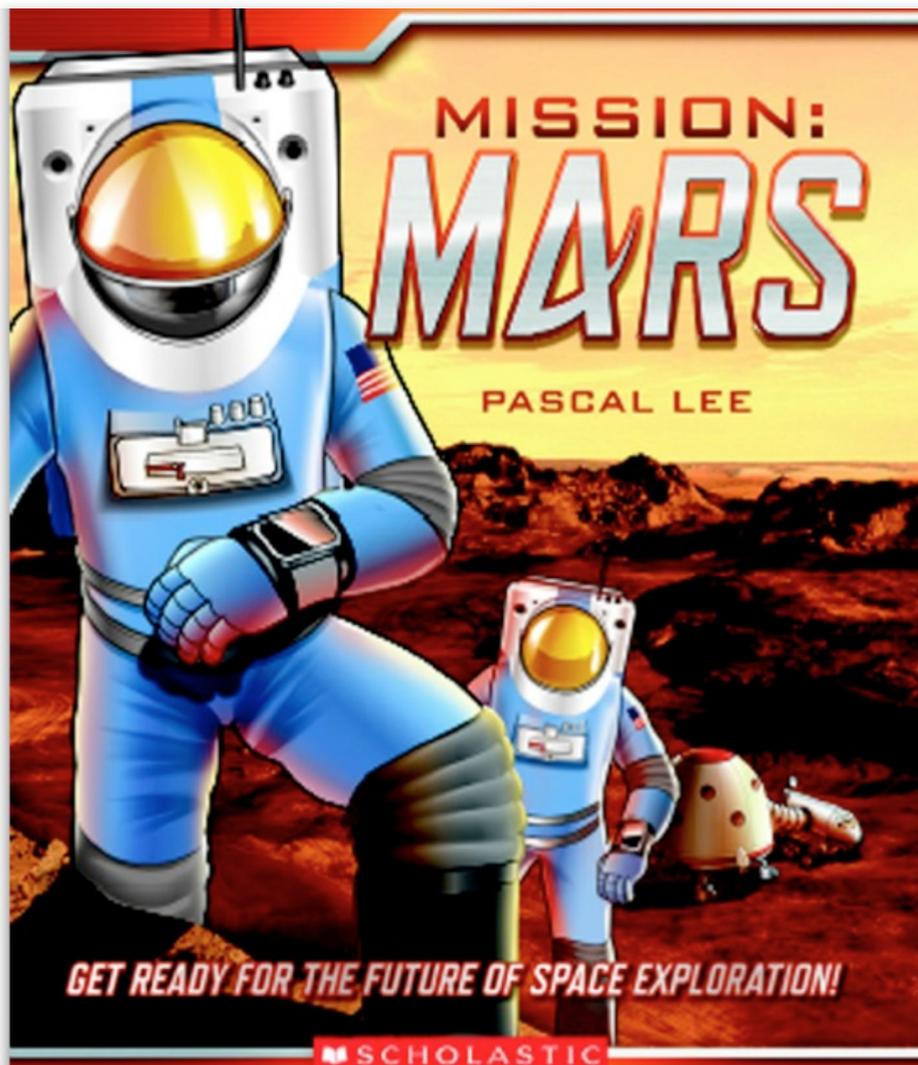


**Bright Idea Award Seal. Photo Credit: Charles S. Clark, Government Executive**

The Ash Center for Democratic Governance and Innovation at the John F. Kennedy School of Government, Harvard University, recognized NASA Research Park as part of the 2015 Bright Ideas program. They described NASA Research Park as a world-class, shared-use research & development and education campus for industry, academia, non-profits, and government, a center for innovation and entrepreneurship with a unique community of scientists, engineers, students and educators with a shared mission.

## Pascal Lee Wins Children's Book Prize

By: Seth Shostak  
23<sup>rd</sup> January 2015



Pascal Lee, a planetary scientist at the SETI Institute located in NASA Research Park authored the award winning children's book 'Mission: Mars'. Photo credit: SETI

It's his first time out of the gate writing a book, but Pascal Lee, a SETI Institute researcher who studies Mars, has taken first place.

Lee has been designated a winner of the American Association for the Advancement of Science/Subaru Science Books and Film Prize for Excellence in Children's Books. Entitled *Mission: Mars*, Lee's short tome not only conveys fascinating facts about the Red Planet, but by describing the nuts and bolts of future human expeditions shows middle school students that science is not a subject to be feared, but is understandable and compelling.

The ability of books to stimulate interests in young people is well known to Lee: "When I was growing up, humans were walking on the Moon. I picked up every book I could find that showed the insides of spacecraft and the workings of spacesuits," he says. Lee went on to elaborate his childhood interest with a research career focused on the history of water on the Red Planet and its two small moons.

Beyond fostering an interest in the sciences, Lee speculates that some of the readers of his book may be among the first humans to actually explore Mars.

The Prize was awarded on February 14, at the Association's Annual Meeting in San Jose, California.

Human journeys to Mars could become a reality in the 2030s, says NASA. Consequently, some of today's kids already have their eyes set on becoming tomorrow's Mars explorers. To help them prepare for this epic voyage, SETI Institute scientist Pascal Lee has written *Mission: Mars*, a nonfiction children's book that reads like a training manual.

The AAAS is the world's largest general scientific society and the publisher of the renowned journal *Science*. Its annual Science Books & Films (SB&F) prize, co-sponsored by Subaru of America, Inc., celebrates outstanding works that foster an understanding and appreciation of science in young readers. *Mission: Mars* earned the top prize in the Middle Grades category.

Published by Scholastic, *Mission: Mars* is geared for kids ages 8 to 13. Besides being scientifically probing and technically rigorous, the book is written in lively language and is richly illustrated. The book also draws on ongoing research at NASA and elsewhere to make human missions to Mars a reality, including Lee's own efforts at the SETI Institute and at NASA's Ames Research Center in Mountain View, California.

Pascal Lee was born in Hong Kong and grew up in France. He studied physics and geology at the University of Paris, and got his doctorate in astronomy and space sciences from Cornell University. He joined the NASA Ames Research Center in 1997, and then the SETI Institute in 2000. Lee's research focuses on Mars, especially the history of water on that planet. He also studies Mars' moons, which are featured in his book. An expert on polar regions that can serve as Mars analogs, Lee has led over 30 expeditions to the Arctic and Antarctica.

*Mission: Mars* is Lee's first book. "I wanted to write a book that would inspire the kids of today to join humanity's next giant leap in space. Above all, I wanted them to not fear science, but embrace it", said Lee.

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## An Audacious Plan to Mine the Surface of the Moon

By: Dominic Basulto  
19<sup>th</sup> March 2015

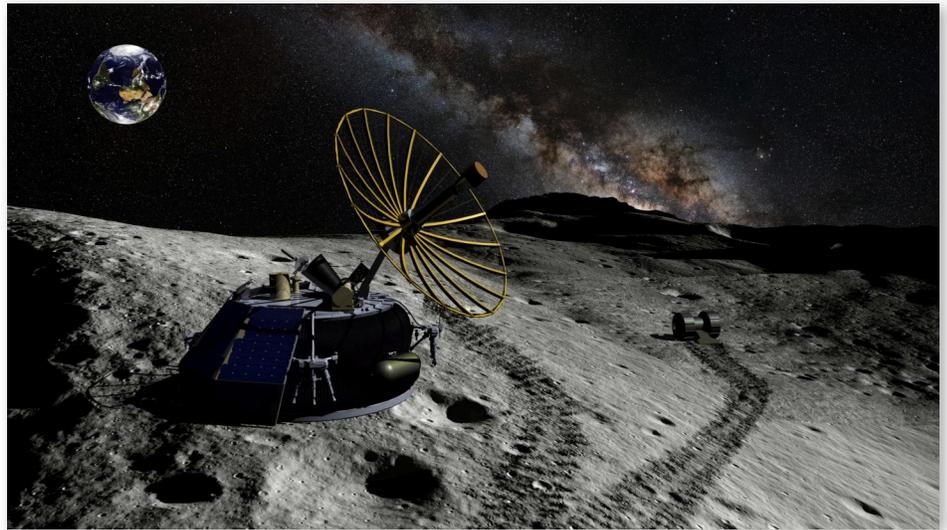
The MX-1 lunar lander is the centerpiece of a plan by Moon Express to mine the surface of the moon.

Sometime in late 2016, a small robotic spacecraft the size of a coffee table will attempt to soft land on the surface of the moon. If it does so successfully, the new MX-1 lunar lander spacecraft from Moon Express would not only win the \$30 million Google Lunar X PRIZE — it would also help to usher in a new era of commercial space exploration.

Soft-landing on the moon is a feat that has only been accomplished before by three superpowers – the United States, Russia and China. The notion that a team of approximately 40 employees at a Silicon Valley start-up that was founded only in August 2010 could pull off the same feat is audacious in and of itself. Thanks to a unique public-private partnership with NASA, Moon Express has access to NASA engineering expertise as well as access to launch facilities at the Kennedy Space Center.

But the real audacity is what happens next – and that's the strategy that Moon Express has for mining the surface of the moon. As Naveen Jain, co-founder and chairman of Moon Express, told me in a phone interview, thanks to initiatives such as NASA's Moon Mineralogy Mapper mission, "We have mapped every inch of the moon, both topographically and mineralogically." As a result, Moon Express has already outlined four categories of resources that might be mined in the future – platinum group metals, rare earth elements, helium-3, and, yes, moon rocks.

Of these, the biggest opportunity by far is helium-3, which occurs on Earth in only minuscule amounts. On the moon, it's a whole different story — since Helium-3 results from solar radiation, and the moon does not have an earth-like atmosphere to block this radiation, it's actually thought to be plentiful on the surface of the moon.



**The MX-1 lunar lander is the centerpiece of a plan by Moon Express to mine the surface of the moon. Photo Credit: Moon Express**

As Jain explains, the ability to mine Helium-3 could have a tremendous future impact on both the Earth and its environment. Helium-3 is a clean, non-radioactive energy source that could potentially power nuclear fusion reactors. Theoretically, a relatively small amount could produce enough clean fuel to power entire industries, if not the entire planet. It's for this reason that the Chinese have also announced plans to mine Helium-3 on the moon.

Another big opportunity on the moon is water, what Jain refers to as the "oil of the space economy." Finding water on the moon would be big — and not just for the obvious reasons. Once you have water (H<sub>2</sub>O), you also have hydrogen and oxygen, and that means you have a hydrogen fuel source for rockets and oxygen to breathe. It also makes it more likely that the moon would eventually become a way station of sorts for further interplanetary exploration, or even a giant "gas station" in outer space.

In thinking about how to commercialize the moon, Moon Express uses the analogy of the moon as the "8th continent of Earth." Once you start to think of the moon as part of the Earth's ecosystem, rather than a standalone object

in outer space, the mind-set changes.

Here's an example of that mind-set change: What do you see when you look up at the moon at night? Most people see a barren, pockmarked surface with zero economic potential. However, Jain views the moon as an "aggregatgator of asteroids" – a source of rare minerals brought by interplanetary asteroids to the moon's surface.

Once we land on the moon again, it will be easier to do it over and over again. Jain uses the example of the 4-minute mile – an athletic feat that was once thought to be impossible. But once the 4-minute mile mark was broken by Roger Bannister in 1954, it only took 46 days for another runner to break that mark.

In the same way, once we prove that a small company can get to the moon without the need for hundreds of millions of dollars in government financing, it could open the door for other companies — including other companies in the Google Lunar X PRIZE competition — also to aim for the moon. As Jain told me, "We are really at a cusp right now, space is going to become accessible for the first time. Exponential technologies are

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**Moon Express, continued from page 4**

all coming together now.”

As an illustration of how the pace of technological change is democratizing the space exploration industry, Jain applies his own background as a successful serial Internet entrepreneur. He likens the task of getting to the moon and back as similar to the task of laying fiber for the Internet to get everyone connected. Using this framework, he describes Moon Express as solving the “last-mile problem” – actually landing on the surface of the moon.

And it’s here that Jain again uses an Internet-era analogy to explain what could happen next. Moon Express refers to itself as the “iPhone of space,” and what Jain says this means is that the company is going to open up the whole “space app” ecosystem once it lands on the moon. Not literally, but figuratively, of course. One example might be the pharmaceutical industry, which could develop new compounds (i.e. medical “apps”) from minerals found on the moon.

To make all this possible, of course, there’s got to be not just cutting-edge technology and the right partnerships, but also the right legal and regulatory framework in place to make all this possible. The 1967 UN Outer Space Treaty was largely created to prevent nations and corporations from commercializing interstellar bodies in some

kind of Dune-inspired spice war to monetize the solar system’s resources.

That being said, Jain points to the recent FAA ruling on “commercial non-interference” for space exploration as a potential breakthrough for commercial mining of the moon. He notes that the 1967 UN Outer Space Treaty never specifically banned commercial activities, and points to the example of the Law of the Sea as a better template for how to govern commercial activities on the moon. The FAA “commercial non-interference” rule, he says, could pave the way for companies to mark off their territory on the moon, even if they don’t actually have ownership of the lunar surface.

However, even if the regulatory issues are addressed, there’s still extensive disagreement in the scientific community about the precise economic potential of the moon. Take helium-3, for example. There could be enough helium-3 to power the earth for 10,000 years. Or there might not be enough to ever make commercial mining profitable, even if the entire lunar surface were being mined. The same argument could be made about any of the other rare earth minerals that have been cited for reasons to mine the moon.

Moon Express’ MTV-1X test vehicle performed a tethered flight test at the Shuttle Landing Facility at NASA’s

Kennedy Space Center in Florida.

While early Moon Express tests have been hopeful – and the company is gearing up for another test soon from Cape Canaveral – there’s still a long way to go. A YouTube video of an MX-1 prototype lander preparing for a test in December 2014 looks more like a university science experiment than the start of a bold new era in commercial space exploration. (In the video, the MX-1 lunar module hangs tethered by a rope from a giant green crane in what looks like a giant parking lot).

For now, though, Moon Express remains one of the contenders to win the \$30 million Google Lunar X PRIZE sometime by the end of 2016. In doing so, it could become a pioneering company in how we think about commercializing the moon. Just as there are now massive multinational corporations engaged in the extraction and delivery of Earth’s natural resources, there could one day be massive interplanetary corporations engaged in the extraction and delivery of the moon’s natural resources. ■



**Moon Express’ MTV-1X test vehicle performed a tethered flight test at the Shuttle Landing Facility at NASA’s Kennedy Space Center in Florida. Photo Credit: Moon Express**

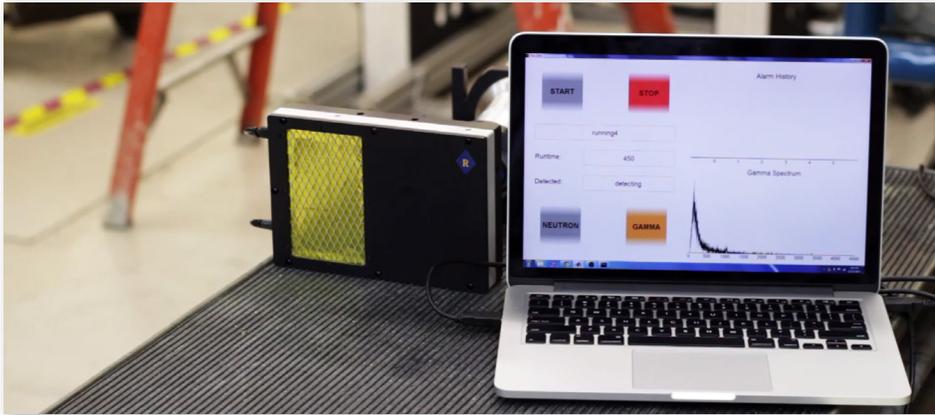
**Please Welcome Deputy Administrator Dava Newman, continued from page 1**

This is an exciting time for NASA as we continue to make extraordinary strides on our Journey to Mars, extend humanity’s reach into our solar system and the universe and strengthen America’s leadership here on Earth.

I know that Dr. Newman is looking forward to working with you as we continue to reach new heights. Again, please join me in welcoming her to the NASA Family.

## Frost & Sullivan Recognizes Rhombus as New Product Innovation Leader

Source: PR Newswire  
17<sup>th</sup> February 2015



**Rhombus' Mercury platform awarded Most Innovative Radiation Detection Product of 2015. Photo Credit: Rhombus Power**

Frost & Sullivan has recognized Rhombus Power Inc. as the 2015 New Product Innovation Leader of the Radiation Detection Instrumentation Industry. Rhombus's Mercury platform for radiation detection is accurate, modular, reliable, scalable, low maintenance and packaged into a cost-effective solution—all factors

that led Frost & Sullivan to conclude that Mercury is the Most Innovative Radiation Detection Product of 2015.

"The flagship Mercury platform and the latest Mercury range of subatomic particle detectors stand out among the radiation detection instruments available today," said Frost & Sullivan Research Analyst Kiran Unni. "With

the strong overall performance of its Mercury platform, Rhombus Power Inc. has earned Frost & Sullivan's 2015 New Product Innovation Award in the radiation detection instrumentation market."

Frost & Sullivan has recognized Rhombus with this award based on independent primary and secondary research across the entire value chain of products in the radiation detection industry.

"We thank Frost & Sullivan for this recognition. We will continue to innovate and develop easy-to-use, accurate, scalable, rugged and reliable nuclear detection solutions for the security, defense and intelligence markets," said Rhombus founder and CEO Dr. Anshu Roy. "It is also exciting to see strong demand for our platform in the commercial nuclear power, neutron radiography and non-destructive testing markets."

## Mercury Headed to the International Space Station

Source: PR Newswire  
16<sup>th</sup> April 2015

A Physics and Astronomy group from the University of Nebraska (Lincoln) has teamed with Rhombus Power Inc. for measuring the solar neutron flux at the International Space Station. This UNL team has won a two-year NASA grant to further research the generation of electric power using neutrons for future deep space flights.

The primary objective of this project is to develop power sources called neutron-voltaics, a type of "solar cell" that works with neutrons that are easily made in space. Such power sources are needed for satellites that go deep into space far beyond the realm of our solar system in regions where solar panels do not work.

The Mercury platform is uniquely suited for real-time measurement of the solar neutron flux background at the International Space Station because of its ease-of-use, reliability and accuracy," said Prof. Axel Enders who leads the UNL team. "This measurement will help us understand how our materials experience fatigue in a space environment because of exposure to cosmic radiation and various radiations in space," he said.

Rhombus founder and CEO, Dr. Anshu Roy, said, "We are pleased to offer our award-winning Mercury platform to the University of Nebraska team and NASA for this exciting mission."



**Rhombus' Mercury uniquely suited for real-time measurement of the solar neutron flux is being sent to the International Space Station. Photo Credit: Rhombus Power**

## NASA Research Park and Department of Commerce work together for National Event

9<sup>th</sup> February 2015



Panelist discussing issues related to developing space to sustain humanity. Photo Credit: Rhombus Power

“Outer space is closer to Silicon Valley than Los Angeles, but it is harder to get to. We can’t do it alone,” said Dr. Rebecca Spyke Keiser, NASA’s Associate Deputy Administrator for Strategy and Policy, as she encouraged greater private sector collaboration at the Discover Global Markets: Sustainable Solutions conference.

The U.S. Commercial Service, an agency of the International Trade Administration within the U.S. Department of Commerce (DOC), in cooperation with NASA, hosted Discover Global Markets: Sustainable Solutions, a three day business conference in Silicon Valley, California, on February 9 – 11, 2015. The conference focused on opportunities for U.S. companies to meet global demand for sustainable solutions, and addressed the link between advanced research and innovation, global business and planetary sustainability. Joanne Vliet, Director, Silicon Valley U.S. Export Assistance Center DOC and the NASA Research Park Director Michael Marlaire developed the partnership between the U.S. Commercial Service and NASA over the course of nearly a year of planning and networking the two federal agencies. Over the previous years, the two had developed a number of international visits to the NRP highlighting NRP partners and new job creation.

The 300 conference attendees had the opportunity to meet one-on-one with

U.S. commercial diplomats from more than 20 countries to obtain real-time market insight and identify potential export opportunities for sustainable technologies and services. Attendees also had the chance to participate in 18 panel discussions led by more than 80 industry leaders on topics including advanced transportation, smart grid, water and land use and green regulations. NASA experts presented two keynote addresses and led a panel discussion session.

Mr. Antwaun Griffin, Deputy Assistant Secretary for U.S. Operations, U.S. Commercial, oversees the Discover Global Markets conference series and said, “We are thrilled at NASA’s participation in the conference. The Ames Research Center is a leader in world class research and development and it is fascinating to learn how NASA’s technological innovations are being developed into commercial applications.”

Director of the International Space Station, Dr. Sam Scimemi, Director of NASA’s Ames Research Center, Dr. Pete Worden, and Dr. Spyke Keiser shared their insights and experiences on how NASA collaborates with U.S. industry to drive innovation. Dr. Worden explained that NASA is called to meet the challenges of environmental change, and to improve life on Earth by partnering with other federal government agencies, local governments, universities, international agencies, and others to provide science data products

and applications that enable policy, business, and management decisions.

Dr. Scimemi called on private industry to engage more fully with NASA and said that there are partnership opportunities for the commercialization of the Space Station. “NASA has paved the way to lower Earth orbit and now it is time for the private sector to take the lead as NASA shifts its sights to Mars,” he said.

The Commercial Service is organizing two additional Discover Global Markets conferences in 2015. Discover Global Markets: E-Commerce Strategies for Exporters will be held in Dallas/Ft. Worth, Texas on October 8-9, 2015. Discover Global Markets: Pacific Rim Consumers will be held in Orange County, California on October 29-30, 2015. To learn more about the Discover Global Markets conference series, please visit [www.export.gov/discoverglobalmarkets](http://www.export.gov/discoverglobalmarkets).

With offices in more than 100 U.S. cities and in 72 world markets, the Commercial Service promotes U.S. exports, especially among small and medium-sized enterprises; advances and protects U.S. commercial interests overseas; and attracts inward investment into the United States. The Commercial Service is an agency of the International Trade Administration within the U.S. Department of Commerce.

SETI Continued from page 3

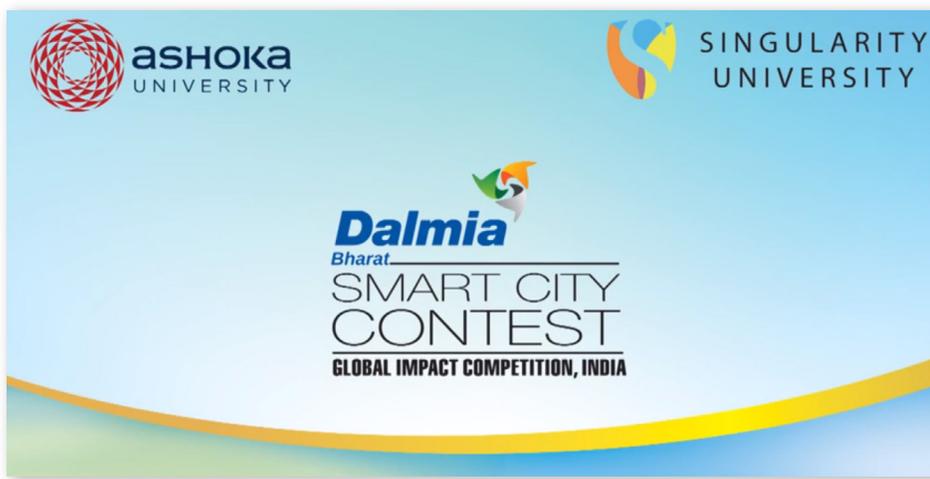


Pascal Lee is co-founder and chairman of the Mars Institute, a planetary scientist at the SETI Institute. Photo credit: NASA

One of Lee’s childhood heroes, Apollo 11 astronaut Buzz Aldrin, praises *Mission: Mars*, saying “Pascal Lee is a true pioneer of Mars exploration. This book makes me want to put on a spacesuit and go to Mars!”

## 24-year-old Wins India's First Smart City Contest; Winning Entry Focuses on Pollution Free Cities for India

Source: PR Newswire  
19<sup>th</sup> March 2015



**Dalmia Bharat Smart City Contest Organized by Ashoka University and NASA Research Park based Singularity University. Photo Credit: Centre for Entrepreneurship Ashoka University**

Shubhojit Mallick was today adjudged the winner of the 'Dalmia Bharat Smart City Contest' which was conducted in collaboration with Ashoka University and NASA Research Park based Singularity University. Shubhojit Mallick won the contest for his innovative project in Bangalore that captures pollutants from automobiles using Nanocylinders to reduce pollution. The contest was conducted over two months and received several entries from across India and Asia. A first of its kind, the contest enabled Indian students to participate in the annual Global Impact Competition (GIC) of Singularity University that is conducted across various countries. The winner received a fellowship worth USD 30,000 and will also attend the Graduate Studies Program (GSP) at Singularity University, US.

Mr. Puneet Dalmia, MD, Dalmia Bharat Group, commented, "We are glad that the first of our initiatives under the Memorandum of Understanding between Ashoka University and Singularity University has come to a successful completion. We are proud to have opened new avenues for youth in India and will continue to do so in the future. The GIC has received tremendous response from students all

over India and we are happy to have played a small role in helping support the government's vision of building smart cities across India."

Singularity University has been conducting the GIC for two years across markets with a different focus and theme for every geography. In India, the contest was launched on January 2, 2015, opening a platform for Indian students to develop innovative ideas that are focussed on helping further

India's dream of building 100 smart cities in the next 3-5 years. The winner will also represent India amongst other students from all over the world at Singularity University.

The six member eminent jury comprised of Puneet Dalmia, MD, Dalmia Bharat, Emeline Paat Dahlstrom, Chief Impact Officer, Singularity University, Shereen Bhan, Managing Editor, CNBC TV18, Vineet Gupta, Founder, Ashoka University and Jamboree India, Dr. Harish Choudhary, Associate Professor, IIT Delhi and Piyush Tiwari, Rolex Awardee, Echoing Green Fellow, Founder, Safe Life Foundation.

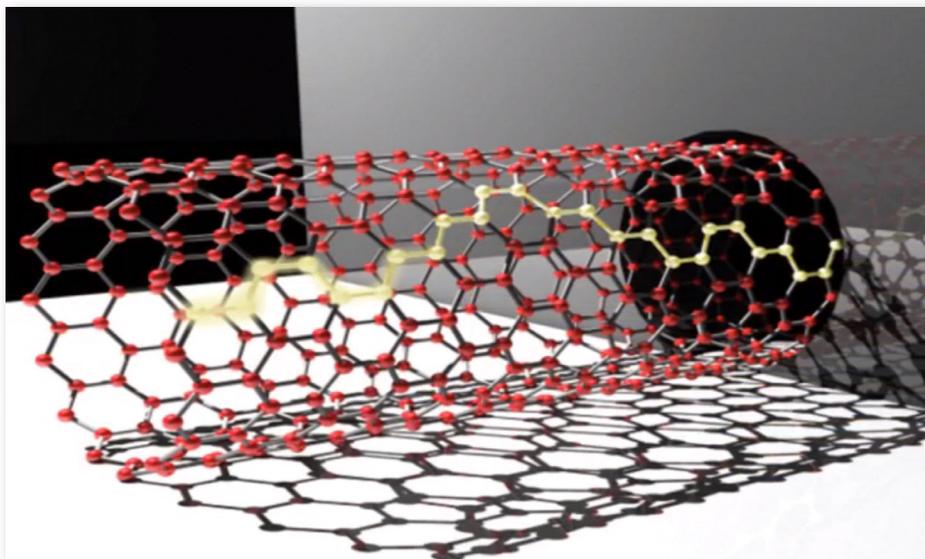
Speaking on the occasion, Mr. Vineet Gupta, Founder, Ashoka University said, "It gives us immense pleasure to open up such avenues for students in India. The contest was organized to highlight the need for innovation and technology in helping realise India's dream of smart cities. Being a young university, we look forward to divulging students to look for such opportunities and constantly experimenting beyond education. The overwhelming response which we have received from students, motivates us to continue doing something new at such a large scale. "



**Shubhojit Mallick, winner of the 'Dalmia Bharat Smart City Contest'. Photo Credit: Centre for Entrepreneurship Ashoka University**

Continued on page 9

Singularity, continued from page 8



**Nanocylinders designed to capture pollutants from automobiles to reduce pollution.**

Photo Credit: Centre for Entrepreneurship Ashoka University

Emeline Paat Dahlstrom, Chief Impact Officer, Singularity University commented, "Our association with Ashoka University has helped us in providing a platform to Indian students through the Global Impact Competition. These competitions act as a medium to identify outstanding entrepreneurs, leaders, scientists and engineers with the most innovative ideas that can positively impact problems facing mankind."

#### **About Dalmia Bharat**

Dalmia Bharat Group (<http://www.dalmiabharat.com>) is a prominent player in India's core manufacturing sector since 1935, with a national footprint. With a turnover of over 7000 crore it has a strong presence in Cement, Sugar, Refractories and Power. A leader in specialty cements and the country's largest producer of slag cement, Dalmia Bharat has a significant presence in generic sugar, catering to several marquee brands. The Group also caters to an enduring and growing customer base in refractories and has forayed into sustainable power/energy.

#### **About Singularity University**

Singularity University (SU) is a benefit corporation headquartered at NASA Research Park in Silicon Valley. SU provides educational programs,

innovative partnerships and a startup accelerator to help individuals, businesses, institutions, investors, NGOs and governments understand cutting-edge technologies and how to utilize these technologies to positively impact billions of people. From its inception in 2008, SU has empowered individuals from more than 85 countries to apply exponentially growing technologies-artificial intelligence & robotics, biotechnology, nanotechnology & digital fabrication, networks & computing systems and medicine & neuroscience-to address humanity's grand challenges: education, energy, environment, food, global health, poverty, security, space and water.

To learn more, visit <http://www.singularityu.org>

#### **About Ashoka University**

Ashoka University aims at being the benchmark institution of tertiary education in India. It seeks to fulfill the unmet needs of prospective graduates by offering an Ivy League-quality undergraduate programme, based on the US liberal education system but at a fraction of the cost. Some of its academic partners include the University of Pennsylvania (ranked among the top five universities in the world), Carleton College (ranked

as the top liberal arts college for pedagogy in the US), the University of Michigan (ranked among top five public universities in the USA), and Sciences Po (ranked first in Europe for research in international relations). The university recently opened its doors to over 100 undergraduates and is located on a 25-acre campus in Rajiv Gandhi Education City in the NCR near Sonapat, Haryana. To learn more, please visit: <http://www.ashoka.edu/in/>

#### **Announcement of New Ames Center Director, continued from page 1**

Eugene was most recently director of Exploration Technology at Ames, Eugene began his career as a research scientist conducting computational fluid dynamics research on the aerodynamics of complex aircraft configurations. He has held research and managerial positions at the center in computational aerodynamics, information technology (IT), and high performance computing and communications. He also has served in the Office of Biological and Physical Research at NASA Headquarters.

Eugene has a bachelor's degree in mechanical engineering from the University of California, Berkeley, and a master's and Ph.D. in aeronautics and astronautics from Stanford University. He is an associate fellow of the American Institute of Aeronautics and Astronautics (AIAA) and received the NASA Outstanding Leadership Medal in 2000 and the Presidential Rank Award for Meritorious Executive in 2009.

I am delighted to have a leader of Dr. Tu's caliber to engage the Ames workforce and harness the center's innovation for cutting edge science and the technology development to support our journey to Mars and the next generation of aviation.

## Google Pledges \$3M to put Students through Singularity University Program

Source: Angela Swartz, Silicon Valley Business Journal  
29<sup>th</sup> January 2015

Google Inc. is pledging \$1.5 million annually for the next two years to help fund local graduate students who might not otherwise be able to afford Singularity University's Mountain View 80-student program.

The funding will go to help fund candidates for the six-year-old teaching organization's ten-week Graduate Studies Program. That curriculum applies entrepreneurship to tackle global challenges like poverty, energy, water, security and health-care issues every summer at the NASA Research Park. Aside from Google, Singularity's founding corporate partners include Genentech Inc., Autodesk Inc., Cisco Systems Inc., ePlanet Ventures, Kauffman Foundation and Nokia Oyj.

"The new agreement with Google is an incredibly important pillar in our

efforts to increase global access and diversity for qualified candidates, regardless of their ability to pay," Singularity CEO Rob Nail said in a statement. "Google's support will further help to break down barriers of access to the Silicon Valley network of technologists, business leaders, and investors."

While Singularity's sponsored Global Impact Competitions winners will continue to comprise a substantial portion of the class, the new funding will enable the university to also make the remaining seats in the program available free of charge to other applicants.

Examples of Singularity projects from previous years include designing a smart, sensed beehive monitoring systems to help beekeepers fight colony collapse and an unmanned



Google is donating money to Singularity University. Photo Credit: Silicon Valley Business Journal

aerial vehicle to ferry medicine and other goods to remote places such a rural Africa.

Singularity said it plans more announcements about programs that aim to eliminate economic, ethnic, gender and multi-generational barriers that persist in the technology sector. ■

## PepBlast Motion Pictures, the Slide Show Maker with Music, is launched!

Source: Globe Newswire  
6<sup>th</sup> April 2015



Photozig, Inc. released the new PepBlast Video Slide App. Photo Credit: Photozig

- 5 - Make a video with pictures and music
- 4 - Make your own slideshow
- 3 - Turn pictures into videos
- 2 - Picture slideshow
- 1 - Movie creator
- 0 - It is a PepBlast app!

Photozig, Inc., an industrial partner of the NASA Research Park, released PepBlast Motion Pictures, a new free mobile app to create video from photos. This video creator can make beautiful short movies quickly to share on Facebook, Twitter, and other social networks. It's quick, easy and fun!

PepBlast lets you mix your photos with music, creating cool videos with few taps, with options to personalize them with different styles, animations, and music that come with the app. A great selection of animated video backgrounds and a thousand of designs

to apply can spice up your pictures to get quick results and create amazing movies.

Before PepBlast, in order to make a video from pictures, you had to get video backgrounds, music, animation, etc. and learn video filming editing, which is hard work and time consuming.

The "PepBlast movie app" allows you to make a slideshow video with music and awesome photo animations in few minutes! You just need to select a theme/style, choose your photos, and let the PepBlast cloud make a video with pictures. You can share it easily as your movie with pictures is already in the web.

There are over 1,000 free video templates or designs, called PepBlast styles, which contain all you need to make a video with pictures and music.

Continued on page 11

## Photozig, continued from page 10

Themes range from Birthday, Love and Friends to Science Fiction and Space. If you want to personalize your movie even more, you can select from over 1,000 free backgrounds, 1,000 free songs, and numerous photo animations, besides choices of title font, color, timings, etc. A quick photo editor is also included to crop and rotate images for the movies.

PepBlast app has been approved by Apple, and it is available in the iTunes App Store. Android users can soon make movies from pictures with PepBlast, as a version for the Google Play store is in the works.

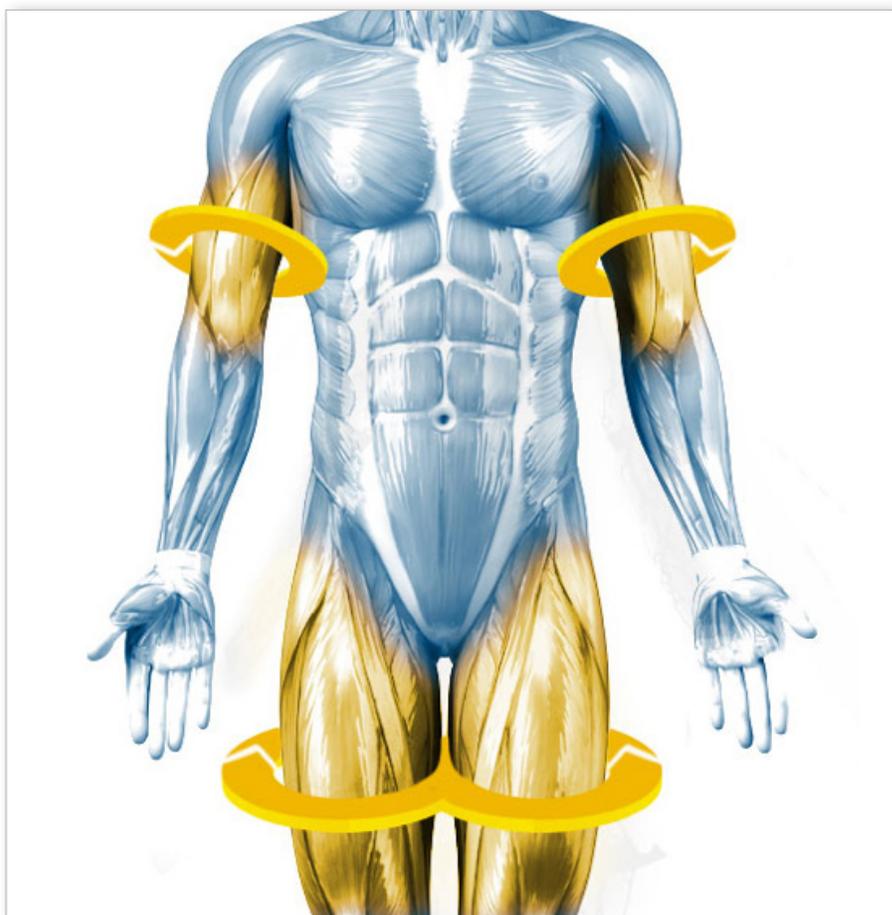
PepBlast movie maker of picture slideshow with music will be soon orbiting the Earth. Get your own motion pic collage for slides and pictures during its takeoff at: [www.PepBlast.com](http://www.PepBlast.com) If you want to make your own video with pictures or make a slide-show easily, PepBlast is indeed a blast!



Show Maker app makes videos with pictures and music, which was inspired by space, technology, art and music. Photo Credit: Photozig

## Liquid Cooling Technology Increases Exercise Efficiency

Source: Spinoff, NASA



Vasper's patented technology is based on liquid cooled compression cuffs that are placed over the body's upper arms and thighs. The cooled compression cuffs place a gentle compression over the arms and legs, which increases the lactic acid burn feeling in the muscles that is typically experienced only with high intensity exercise. The user then performs exercise using a Vasper enhanced elliptical trainer and custom designed software protocols for 20 minutes. Photo Credit: Vasper

In the mid-1960s, NASA adopted for spacesuits a concept originally developed by the British Royal Air Force to provide cooling for aircraft pilots in hot environments. It utilized a battery-operated miniature pump that cycled chilled water through a series of tubes lining the garment, which pressed against the skin, absorbing heat.

A team of scientists and engineers at NASA Ames Research Center have since investigated the physiological effects of such artificial cooling technologies and as a result, a number of spinoffs have emerged. Once company, Cool Systems (now Game Ready), sells a device consisting of ergonomic wraps connected

to a control unit, which delivers pressure and cold to speed up recovery time for injuries (Spinoff 2004).

Peter Wasowski, a co-founder of Cool Systems, is now utilizing a similar technology to help people of all ages and abilities improve their fitness and overall health.

In the late 1990s Wasowski became interested in vascular compression: a method of exercise whereby compressions is added to arm and leg muscles to hasten the buildup of lactic acid, signaling the brain to release anabolic hormones responsible for rebuilding and strengthening damaged muscle tissue. He knew

Continued on page 12

**Vasper, continued from page 11**



**Patrick Marleau, a Canadian professional hockey player and two-time Olympic gold medalist, completes a Vasper session. The exercise regimen uses NASA-derived liquid cooling technology to concentrate both lactic acid and oxygenated blood in the muscles, which is said to improve workout efficiency and reduce recovery time. Photo Credit: Vasper**

that colder temperatures also improve efficiency as well as comfort.

With Vasper Systems, headquartered in San Jose, California, Wasowski incorporated the NASA liquid cooling technology into compressive cuffs, which are applied to the arms, thighs, and chests of clients as they complete a low-impact, 30-minute exercise routine on a recumbent bike. The brisk workout produces similar results to other exercises that take longer than an hour. Other benefits include less wear and tear on the body and reduced soreness after exercise.

"The technology's made quite a journey," Wasowski says. "Its wonderful how it's found a critical use back on Earth in helping people lead healthier lives while helping others compete at the highest levels in sports."

## **NRP Research Center Veteran-Owned Company Receives SBA Business Award & National Institute of Packaging, Handling, & Logistics Engineers (NIPHLE) Packaging Engineering Award**

By: Renee Mitchell  
24<sup>th</sup> April 2015

On 24 April the Small Business Administration, Veterans Business Outreach Center (VBOC) Region IX, servicing California, Arizona, Nevada, Guam and Hawaii recognized Bob Vermillion, CEO of NRP's RMV Technology Group, LLC. The award was presented by Coreena Conley, CEO & Founder.

RMV Technology Group LLC, a NRP Industry Partner, is a Service Disabled Veteran Owned Business (SDVOSB). Bob Vermillion, CEO/Founder, is a Subject Matter Expert in Advanced Materials, Protective Packaging, Aerospace Materials Testing Laboratory, System Level T&E, and Technology Training Center. Most recently, Bob trained the SME ESD Program Managers from NASA and JPL in March 2014. Located onsite in Building 19, next door to UC Santa Cruz and down the hall from Carnegie Mellon, RMV provides ESD/EMC engineering services for NASA, DOD, DOE and their partners and suppliers.

On 5 May 2015, Bob will be a featured

speaker during the NIPHLE Training Conference near the US Army Picatinny Arsenal, New Jersey. Bob has been invited to present a white paper on "Suspect Counterfeit Materials & Packaging in the DOD Supply Chain" following the Keynote Speaker, Paul D. Peters, Principal Deputy Assistant Secretary of Defense for Logistics & Materiel Readiness. The DLA, DCMA, US Navy, USMC, GSA, the aerospace primes and the US Army are active members with NIPHLE since 1956.

During the Awards Dinner, Bob will be presented with the NIPHLE Corporate Award given to few companies that include Sealed Air Corporation, AGM, and Lansmont.

Sean Kerins, President of Sealed Air Corporation said "This award is presented to an organization which displays a great deal of integrity and ethics in conducting business. The corporation is a long time and active member of the NIPHLE family. They put the success of their government



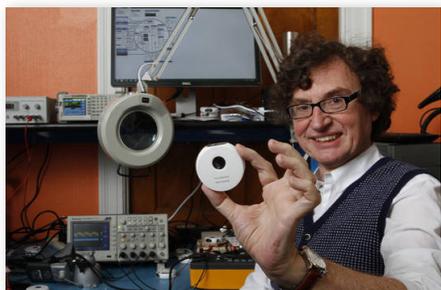
**Bob Vermillion, RMV CEO and Kevin Smith, NIPHLE Past President and USMC Logistics Management Specialist at the Pentagon. Photo Credit: RMV**

customers ahead of their own financial needs. A company that is innovative assists our government partners to exceed their expectations, especially the military."

The NIPHLE recognition represents Bob's packaging engineering passion. The Institute of Packaging Professionals (IoPP) awarded Bob Vermillion, CPP, Fellow the 1st Place (USA) 2002 AmeriStar Electronic Category Award for his Packaging Engineering Design.

## Scanadu Raises \$35 Million From Fosun, Tencent for Its Health Scanner

By: Timothy Hay, The Wall Street Journal  
27<sup>th</sup> April 2015



**Scanadu co-founder and Chief Executive Officer Walter De Brouwer holds the company's Scout device. Photo Credit: Scanadu**

Scanadu Inc., a company that is aiming to bring hospital-grade diagnostic tests to consumers' smartphones, has raised a \$35 million Series B round to push further into clinical trials for its Scout device.

The Scout device is a small, disc-shaped gadget that has its own tiny operating system inside, as well as gyroscopes, electrodes, reflective light-emitting diodes, accelerometers and other sensors. The Scanadu Scout is meant to be pressed against

the side of a user's head, near the temple.

"The company is in the midst of filling several thousand orders for its \$199 device that came about in the company's 2013 Indiegogo campaign, which brought in \$1.6 million from more than 8,500 backers", Chief Executive Walter De Brouwer said.

At the same time, Scanadu is attempting to get its device approved as a medical-grade diagnostic in both China and the U.S., he said.

To help move the product forward in the U.S. and China, Scanadu raised Series B funding that was led by Fosun International Ltd. The round also include new investors Tencent Holdings Ltd., China Broadband Capital, IGlobe Partners and Sungent BioVenture, as well as returning backers Relay Ventures and AME Cloud Ventures.

The Mountain View, Calif., company raised a \$10.5 million Series A round

in 2013. Scanadu has also been funded by Zappos Inc. founder Tony Hsieh through his Vegas Tech Fund, Redmile Group, Broe Group and Mindful Investments.

"The Scout so far has been approved by the Food and Drug Administration as an "investigational device," meaning it can be used in the context of a study. The IndieGogo investors are signing consent forms to allow the FDA to study how the devices are being used", Mr. Brouwer said.

But Scanadu has much broader ambitions for the device, including combining it with test-strips and other technologies so that it can provide a detailed reading on blood and urine samples, as well as examine DNA.

The company is in the midst of human clinical trials with the Scout as a urinalysis device, and has a longer term regulatory path to get the Scout cleared to analyze blood and DNA, Mr. De Brouwer said. ■

## Made In Space, Now Taking Orders

Source: Made In Space  
8<sup>th</sup> April 2015

Made In Space, the company that built and operate the Zero-Gravity 3D Printer on the International Space Station, is looking for customers. The company is now taking reservations for its Additive Manufacturing Facility (AMF), which is the successor to the first Zero-G 3D Printer which was designed as a technology demonstration with NASA. Unlike the first printer, the AMF is meant for commercial utilization. Space developers around the world can leverage the power of getting design concepts to space in days rather than months or years, using the much improved iteration cycle for their own experiments, projects, and missions.

"We can not wait to provide access to this technology to young space



**Zero-Gravity 3D Printer. Photo Credit: Made in Space**

developers and outside-the-box thinkers who will no doubt use this new capability in ways we can not even imagine." - Mike Snyder, Lead Engineer & Head of R&D

Made In Space, makes this announcement in preparation for the 2015 Space Tech Expo in Long Beach, California. There they will be

showcasing the first printer as well as ground copies of the 3D printed parts that were printed in Space.

"Unlike the tech demo printer we built, the AMF is designed to last as long as the space station itself and we hope to find some of its first commercial customers at Space Tech Expo. What better place to look for people who want to pioneer the new technology of zero-gravity design?" Brad Kohlenberg, Director of Marketing. ■

## skyTran™ Inc., Entered into an Agreement with Sustainable Systems of Colorado to Seek Environmentally Compelling Transportation Solutions

Source: skyTran



Artist conception of skyTran personal rapid transit. Photo Credit: skyTran

skyTran™, Inc., a NASA Space Act Company headquartered in Bldg 14 of the NASA Research Park, announced that it has entered into an agreement with Sustainable Systems of Colorado (SSC), a non-profit Colorado corporation engaged in seeking environmentally compelling transportation solutions. Pursuant to the agreement, SSC will fund the establishment of the Christopher Perkins Memorial Advanced Transportation Research and Development Center in Firestone, Colorado. Christopher Perkins, a leader in advancing high-tech, energy efficient transportation for over a decade, succumbed to cancer in 2014.

The formation of the Center follows SSC's recent agreement with skyTran to collaborate on bringing skyTran's high-speed, energy-efficient, patented, skyTran MagLev (STML™) system to Colorado. skyTran has had a long relationship with NASA, research entities, universities, the US Department of Transportation, and more. The Center will advance the development of sustainable transportation alternatives that can be imple-

mented to support and connect with established modalities.

Firestone Mayor, Paul Sorensen, said, "We are excited to move this initiative forward and plan to do our part in working with SSC to continue our

work to improve the quality of life in our State."

Jerry Sanders, skyTran CEO, said, "We are heartened to take part in this exciting venture and to honor Christopher, a dear colleague who had a vision of dramatically improving the world of transportation. The Center will be a wonderful way to promote his message and to bring the promise of clean, energy-efficient, user-friendly, high-speed transportation to Colorado and the rest of the world."

Dr. R. Paul Williamson, SSC's founder, sees the Center being an important site that will foster intellectual inquiry, advance scientific research, develop technological integration, promote public-private partnerships, enhance S-T-E-M curriculums, incorporate student involvement, and create jobs in research, robotics, green manufacturing, IT, advanced engineering, maglev, fuel cells, broadband communications and power distribution.

For more information on skyTran and Christopher, please visit: [www.skytran.us](http://www.skytran.us).



Aerial view of Firestone, CO, 15 miles North of Denver. Photo Credit: skyTran

## NeuroVigil Closes Second Financing Round

Source: Business Wire  
1<sup>st</sup> May 2015



**iBrain™ device created by Neurovigil.**  
Photo Credit: Neurovigil

Leading Neurotechnology company NeuroVigil announced today that it completed a second financing round in which the Company issued equity securities at a pre-money valuation that was over two-and-a-half times the post-money valuations of the Series A financing rounds of Google and Facebook, combined, for less than 0.5% of its common stock. The company's 2011 seed financing round, wherein NeuroVigil sold less than 2% of its common stock, was at a pre-money valuation that was over twice the combined seed valuations of Google and Facebook. "I continue to be impressed with the way NeuroVigil has met and exceeded its milestones," said noted seed investor Dr. Howard Morgan, who led this financing round. Co-investors include space entrepreneur Elon Musk, venture capitalist Tim Draper, and venture capital firms Draper Fisher Jurvetson (DFJ) and Zone Ventures. "Companies like NeuroVigil and entrepreneurs of Dr. Low's intellect and bold vision embody DFJ's mission to identify, serve, and provide capital for extraordinary entrepreneurs anywhere who are determined to change the world ... The societal returns on believing in Dr. Low and NeuroVigil are well worth any investment," remarked Tim Draper, managing director of DFJ.

NeuroVigil was bootstrapped during the Great Recession by its chairman and CEO, Dr. Philip Low, who owns about 89% of the company, which he founded when he was a graduate student in computational neuroscience at the Salk Institute for Biological Studies and whose PhD work on non-invasive brain biomarker extraction, summarized in a one-page thesis, led to the formation of NeuroVigil. "To paraphrase nuclear physicist Ernest Rutherford: 'We had no money, so we had to think,'" said Dr. Low who decided at the time to postpone entry into the consumer space and instead forge alliances with the pharmaceutical industry to generate cash flow and significant intellectual property, thus opting to forgo traditional consumer-driven venture capital support in favor of an aggressive multifaceted science-based strategy combining algorithms, devices and database technology. The mathematical formalism created by Dr. Low, including the SPEARS algorithm, enabled NeuroVigil to extract higher bandwidth from a single non-invasive electroencephalogram (EEG) channel and to dramatically reduce its footprint. This capability, combined with a wireless connectivity, provided the company with the potential to track a large number of people (whether on Earth or astronauts in space), thus making it easy to broaden the research population and monitor human brain activity with high precision and throughput and without encumbering subjects. "Philip discovered a fundamentally new way to assess brain activity. This technology is having tremendous impact," recalled Nobel Laureate and Salk Institute Interim President Emeritus, Dr. Roger Guillemin.

The company was launched in 2007 and is responsible for the iBrain™ portable brain monitor that has been used since 2009 by the pharmaceutical industry (i.e. companies like Roche and Novartis) to gather data from the brain in clinical trials for research purposes, including from children

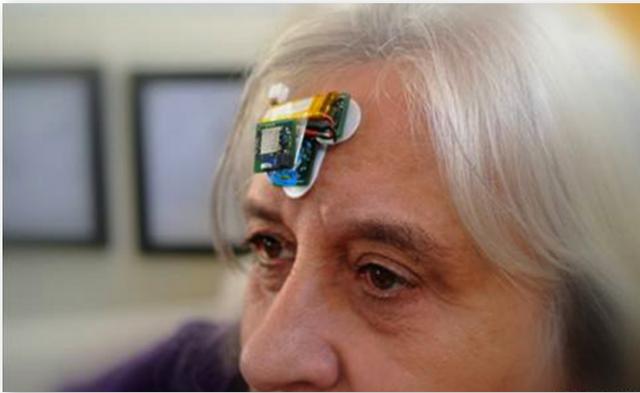
with autism and outpatients. Typically NeuroVigil owns all the intellectual property and biomarkers generated from such collaborations including any generated by its clients and has access to an international portfolio of pending and granted patents. The company has also launched in 2011, at the request of NeuroVigil advisor and theoretical physicist Stephen Hawking, a program to help individuals with ALS communicate by thought alone, and has developed substantial intellectual property on this topic. In 2013, an ALS sufferer was able to spell a word using this non-invasive technology, which is still being further refined. "Dr. Low and his company have done some outstanding work in this field," observed Stephen Hawking. In 2015, NeuroVigil attracted significant interest from the senior care industry and is in negotiations with the largest senior care industry operators to monitor thousands of seniors as they progress from mild cognitive impairment to dementia. An initial contract has already been signed.

"Neurotechnology is here to stay, and NeuroVigil is excited by the awesome opportunity to keep doing good for the world and well for its shareholders," said Dr. Low, NeuroVigil's, Founder, Chairman & CEO.

NeuroVigil is a world leader in neurotechnology and computational neuroscience, and is dedicated to the betterment of the human condition by merging non-invasive wireless brain recording technology with advanced computational analysis techniques applied exclusively on human data. The award-winning company has developed proprietary technology which leverages the dynamic oscillations produced across the sleep/wake cycle in order to systematically scan the human brain for signs of pathologic activity, years in advance of cognitive or behavioral symptoms. The company, headquartered in La Jolla, California, has an active program on assistive neurotechnologies based at the NASA Research Park. ■

## Neurotech Goes Global: Tens of Thousands of Brains Coming Online

Source: Editors, MedGadget  
4<sup>th</sup> February 2015



**iBrain portable neural monitor, used to collect brain activity data. Photo Credit: NeuroVigil**

NeuroVigil, the company that has developed high resolution and high throughput software algorithms to seek out changes in neurobiological activity from a single sensor, its proprietary iBrain portable neural monitor, has partnered with the American Senior Housing Association (ASHA) to gather tremendous quantities of new and highly useful data. The plan is to have thousands of volunteers living in senior housing share their brain activity data to identify how sleep, diet, or other changes in lifestyle affect the aging brain.

The iBrain device works with the proprietary SPEARS algorithm that converts EEG data into a map of brain activity. It can identify unusual patterns and can notice day to day changes in the brain's activity. The initial launch of the program will include more than 20,000 iBrain units.

Dr. Philip Low, the CEO and founder of Neurovigil, notes that unlike trends of the past, "the data we will be generating in the 21st century will overwhelmingly come from outside the lab. It will be generated from asymptomatic humans as opposed to from diseased animals."

"We are looking at the biggest living laboratory in the world," said John Rios, Chairman of ASHA "We fully expect an initial launch well over 20,000 iBrain units representing a conservative initial market penetration of less than 1%."

"We have been following the groundbreaking work of Dr. Low and NeuroVigil, and as an organization dedicated to life enrichment and improving quality of life for seniors, we could not ask for a more sophisticated neurotechnology partner to provide assistance to our leading member operators and owners who have invested tremendous energy to develop various cognitive enrichment, nutritional and wellness programs. There is a considerable need to objectively analyze the impact of these activities on a very broad scale and we are excited to be assisted by NeuroVigil," said David Schless, President of ASHA.

## Associate Administrator for Small Businesses Visits Made In Space.



Interested in finding out how to do business with NASA Ames Research Center? Please contact Christine Munroe, Small Business Specialist [ARC-SmallBusiness@mail.nasa.gov](mailto:ARC-SmallBusiness@mail.nasa.gov) or visit our website <http://osbp.nasa.gov/>. Learn more about SBIR/STTR funding opportunities at [www.sbir.nasa.gov](http://www.sbir.nasa.gov), Photo Credit: NASA

## Minister of Foreign Affairs Visits NRP



Mr. Sebastian Kurz, Minister of Foreign Affairs from the Republic of Austria with 40 executives and CEOs of companies visited Ames and NRP on April 30, 2015. They received a Center overview by Dr. Charles Smith, Acting Center Director and a briefing on NRP partnerships by Meighan Haider, Acting Director of NASA Research Park. Photo Credit: NASA

## NRP POST

### NASA Research Park

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