National Aeronautics and Space Administration

The NRP Post

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Summer 2014

Photo source: NASA

NASA Ames Research Center and NASA Research Park.

Innovation Space

by Debra Werner
Space News

Instead of gathering around a conference table, people who visit the Space Portal of the NASA Research Park are invited to settle into one of the large upholstered leather chairs arranged in a circle. Although the grouping of mismatched furniture appears haphazard, it is designed to make visitors feel at ease while discussing commercial business ventures, financing options or government space policy. “If you want to innovate, you need comfy chairs,” said Daniel Rasky, Space Portal director.

Innovation is the primary goal of the Space Portal, an organization established in 2005 by a group of NASA veterans with diverse backgrounds who shared a common interest in promoting commercial space activity. That group included: Rasky, an expert on thermal protection technologies; Lynn Harper, one of the founders of the science of astrobiology; Mark Newfield, NASA Ames project manager for the Mars Exploration Rover Thermal Protection System; and Bruce Pittman, an aerospace engineer who worked on NASA satellite missions before co-founding commercial space ventures, including Kistler Aerospace Corp. and SpaceHab Inc.

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NRP Hosts Small Satellite Experts at Kentucky Space PocketQube Workshop

The successful November 2013 launch and orbital insertion of several PocketQube-class satellites by Kentucky Space and other partners led to a workshop on April 17, 2014 at NASA Research Park in Silicon Valley. The PocketQube 1.0 Workshop brought together nearly 45 spacecraft designers, innovators, makers, entrepreneurs, and educators from five countries to discuss and explore the range of possible uses and applications for these novel spacecraft.

CubeSats have fundamentally reshaped our thinking and imagination about what is possible in space. Now the design of an even smaller platform, the PocketQube class satellite (measuring 5cmx5cmx15cm and weighing just under one pound), further demonstrates the power and potential of new micro technologies in space…and at a cost less that you might pay for a top-of-the-line bicycle. The PocketQube class satellite, invented by Bob Twiggs (also the co-developer of the CubeSat), is envisioned to have a wide range of possible applications, including: space network notes, sensor platforms,

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Photo by NASA / Eric James

NASA Ames Center Director Dr. Pete Worden addresses the PocketQube workshop.

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NRP Welcomes

Boreal Space

Building 19, Room 1015
Commencement: May 1, 2014

Boreal Space provides technical consulting to organizations proposing space missions ranging from the search for exoplanets, to near ultraviolet surveys of stellar populations, to research and development focusing on new architectures such as fractionated systems. We are providing operations and maintenance support for spacecraft currently on-orbit. Our aerospace team has many years of experience defining, designing, testing, integrating and deploying robust space systems for NASA, Lockheed Martin, the Department of the Navy, US Air Force and others. These systems have consistently exceeded client expectations. Our consulting services include Systems Engineering, Satellite Communications, Electro-Optical Payloads, Guidance Navigation and Control, Flight and Ground Software, Test Engineering and Mission Operations. Boreal Space - small team, big results.

DSI

Building 156, Rooms 202 and 204
Commencement: July 1, 2014

Deep Space Industries is focused on the utilization of in-space natural resources to change the economic model of doing business in space. DSI will provide the technical resources, capabilities and system integration required to discover, harvest, process and market in-space resources. DSI and Ames initially will explore collaborative opportunities using "proof of concept" missions, eventually moving to using space resources to service the emerging in-space markets for propellant and building materials.

S3 USA Holdings Inc.

Building 19, Room 2024
Commencement: April 1, 2014

Swiss Space Systems (S3) opened its first US subsidiary in 2013 in Washington, DC. to further develop their markets in small satellites and aerospace. S3 USA Holdings, Inc. is currently setting up operational centers around the U.S. to further partner with the US aerospace industry and to develop its affordable and reusable SOAR air-launched space system. S3 and Ames will explore opportunities for technical collaboration in the area of small satellites.

Made In Space

Building 153
Commencement: July 7, 2014

Made In Space, Inc. has partnered with NASA MSFC to launch a 3D printer, customized for microgravity, to the International Space Station in 2014. This device will be the first manufacturing device used off-Earth and will be an invaluable resource for astronauts. A future 3D printer, the Additive Manufacturing Facility (AMF) will also be available to researchers, businesses, artists and individuals to utilize. Through the benefits of the NASA SBIR program, Made In Space has been able to further its goal of enabling in-space manufacturing.

"Made In Space 3D Printer Gets Green Light from NASA for Launch" - story on Page 11.

A Day at Singularity University, Where the Future Belongs to Glowing Plants and Robotic Elephants

by Signe Brewster, Gigaom.com
March 4, 2014

Men and women in suits and sweatshirts mill about, speaking in a mash of languages. It's midway through the week at the Singularity University executive program, a seven-day institute offered several times a year where, for $12,000 a ticket, participants get a crash course in fields like biotechnology, neuroscience and robotics.

"Burning Down the House" blares over the speakers, prompting everyone to settle into their chairs. Inventor and serial founder Saul Griffith takes the stage. He wears a beard, jeans tucked into boots and a shirt the color of an ice cream sundae. It's difficult to tell if he's about to chastise the room or give a speech. He announces that he hasn't prepared anything, so he's just going to give a tour of his desktop.

Over the next hour and a half, he meanders between drones covered in electricity-generating turbines, natural gas-powered cars, custom bikes and how math is changing design. He

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Photo by Signe Brewster

Saul Griffith presents a robotic arm sling. It has no hard parts, yet it can improve strength and bring control back to people who have lost it.

Pete Worden and Jacob Cohen Invite Experts from Industry and Academia for a CO_2-Based Manufacturing Weekend Workshop

By Shawn Conard, NASA Ames Space Biosciences Division

NASA Ames Research Center recently held a weekend workshop focused on the use of CO_2 as a feedstock for manufacturing materials such as food, fuel, and chemicals. All of these applications are highly valued for space missions. The goal of the conference was to bring together NASA experts with academia, industry, non-profit research organizations, and other federal agencies to share ideas and to generate innovative concepts that could lead to valuable collaborations.

Using CO_2 as a manufacturing feedstock would be a triple win for NASA: each astronaut produces a kilogram of CO_2 per day on the International Space Station, the Martian atmosphere is 96% CO_2 and the Earth's CO_2 is increasing, heating up the planet and causing climate change. Speakers presented work on subjects such as CO_2 electrolysis, electrochemical reduction of CO_2, microbial electrolysis cells, and the production of materials such as alkenes, polymers, radiation shielding materials, and foams.

"We wanted to change the conversation about CO_2. It's not just a waste product, it can also be a useful feedstock for making products and commodities in space", said John Cumbers, Lead for Planetary Sustainability at the NASA Ames Space Portal, and a member of the workshop organizing committee.

The event also included three "breakout sessions" where attendees formed small groups and were tasked with creating mission designs to solve specific problems. This process is known as Concurrent Engineering and is used to rapidly generate and evaluate new ideas. The problems presented in the workshop included the design of a system to produce 3D printing feedstock on the Martian surface, the design of a sustainable food system for low earth orbit, and the evaluation of a proposal to prevent ice cap melt.

The workshop was part of a series of weekend workshops hosted by Pete Worden, NASA Ames Center Director, and Jacob Cohen, NASA Ames Chief Scientist. The event was organized by members of the planetary sustainability team: John Hogan, John Cumbers, Elysse Grossi-Soyster, and Shawn Conard.

Photo source: NASA

Attendees at Pete Worden's CO_2-Based Weekend Workshop, part of NASA Ames' Planetary Sustainability efforts. See http://www.nasa.gov/spaceportal for more details.

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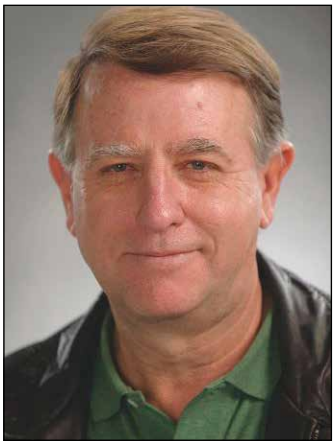
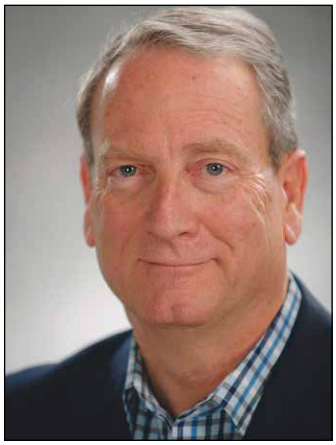
Photos by NASA/Dominic Hart

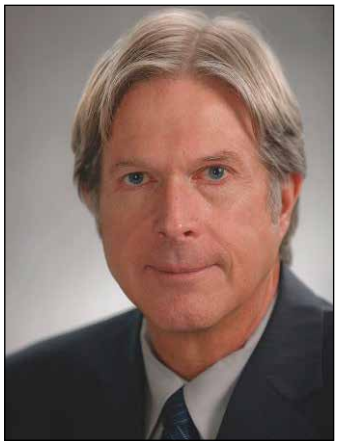


Daniel Rasky

Lynn Harper



Bruce Pittman



Gary Martin

The multidisciplinary nature of the Space Portal team is one of its primary strengths and a reflection of the culture of Silicon Valley, said Gary Martin, director of new ventures and communications at the NASA Ames Research Center in Mountain View, Calif. With the support of local communities, NASA Ames established the NASA Research Park in 2002 on land formerly occupied by the U.S. Naval Air Station Moffett Field.

Space Portal leaders say another strength is their collective decades of work inside the space agency including hands-on flight experience. Before founding the Space Portal, "we all found creative ways to work within the bureaucracy," Rasky said. "That usually meant taking risks and working with people outside our own small groups."

Space Portal members continued that pattern of seeking outside support when they developed the programmatic concept for the Commercial Orbital Transportation System (COTS), which promised a total of $500 million to companies to demonstrate orbital transportation vehicles. "We had to figure out how to design a program that would attract private equity and lead to a service that NASA needs," Rasky said.

With help from Alan Marty, a Silicon Valley venture capitalist, Space Portal leaders devised the approach that NASA later followed. Instead of following the traditional practice of paying companies for costs incurred developing a new launch vehicle, the Space Portal suggested NASA craft funded Space Act Agreements that offered rocket builders the opportunity to propose their own milestones but receive payment only when NASA confirmed that each company had achieved its stated goals. That approach paid off in 2012 with Space Exploration Technologies Corp.'s first commercial cargo delivery to the international space station. Orbital Sciences Corp., the COTS program's other funded participant, made its first paid cargo run this month.

Since the Space Portal's inception, its leaders also have worked to promote greater utilization of the ISS. In 2005, the Space Portal organized a workshop, with the support of then-NASA Administrator Michael Griffin, that brought together government and industry researchers eager to conduct experiments in microgravity with firms interested in providing space station support services and potential funders from NASA and the investment community. "To our knowledge, it was the first meeting that brought together suppliers, researchers and financiers," Rasky said.

That workshop helped to publicize the varied types of research that could be conducted on orbit and served as a jumping-off point for successive meetings, workshops and discussions, said Harper, the Space Portal's integrative studies lead.

Many of the Space Portal's activities are designed to help entrepreneurs and companies with little experience working with NASA gain access to the space agency's expertise. "People come to the Space Portal informally to get advice," Rasky said. "We hook them up with the right people to encourage collaboration."

One of those people was Peter Platzer, a former NASA Space Portal intern who later established Nanosatisfi LLC, a San Francisco-based startup that obtained funding through a Kickstarter campaign to build and launch cubesats people can program through the Internet to conduct experiments. "The people at the Space Portal are energetic and full of ideas," Platzer said by email. "Their support was tremendous."

Other recent visitors to the Space Portal include California Gov. Jerry Brown and Steve Jurvetson, managing director of Draper Fisher Jurvetson, an investment firm that provided early backing for SpaceX of Hawthorne, Calif., and Earth imagery startup Planet Labs of San Francisco.

"You see this swirl of ideas and interaction of different players," said Pittman, Space Portal flight projects director. "Those interactions are helping to increase the pace of commercial space activity. We are bringing the pace of Silicon Valley to the space program."

Instead of looking for government to lead the way toward future space settlement, Space Portal leaders look to private industry.

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"Government can help but it cannot lead the way," Martin said.

That government help is likely to come in the form of public- private partnerships, Rasky said. Because unlike the Apollo era when U.S. leaders were willing to devote massive resources to the goal of sending people to the Moon, a significant portion of future exploration is likely to be financed privately.

Throughout history, exploration often has been financed by people willing to devote personal fortunes toward those lofty goals, Harper said. That trend is continuing as wealthy individuals, such as Virgin Galactic founder Sir Richard Branson, Blue Origin founder Jeff Bezos, SpaceX founder Elon Musk and Bigelow Aerospace founder Robert Bigelow, use their own money to support commercial space enterprises, she added.

In addition to focusing on exploration, Space Portal members began working in 2012 with Silicon Valley organizations, businesses and individuals to identify advanced technological solutions to make life on Earth more sustainable. Much of that technology was inspired by NASA space exploration research because successful space missions beyond low Earth orbit require extremely efficient use of water, oxygen and other essential resources, Rasky said.

The Space Portal's budget of approximately $1 million a year comes from a variety of sources, including NASA's Emerging Space Office at NASA headquarters. That includes money to pay the Space Portal's eight employees and little additional funding for meetings and conferences.

"We are the organizational equivalent of stone soup," Pittman said.

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charges that the 3D printer is both the Chia Pet of the 21st century and a Trojan Horse hiding a real technological advancement. He tosses the crowd a stuffed pink elephant–a prototype for what later morphed into a robot.

After lunch, he's replaced by a more reserved John Hagel, a consultant and author who lectures at the university. Then comes X Prize founder Peter Diamandis, who makes the case for incentive-driven challenges.

All of the speakers had one thing in common: they covered what SU labels "exponential technologies." Generally, they're connected by their fast-moving nature and potential to fundamentally change how the world goes about its business. Most are only being made possible by the rapid decline in computing costs. And they all have the potential to solve what SU has dubbed the world's grand challenges: problems like global health, water, energy, the environment, food, education, security and poverty.

Life at SU

SU has three core programs, including its executive program, startup accelerator SU Labs and a summer program that targets recent graduates. While the executive class runs for seven days, the summer program lasts 10 weeks and is focused on teams, each of which builds its own project. Both educational programs feed into the accelerator. As first reported by Gigaom, SU will also launch a $50 million venture fund this year to further boost its affiliated startups.

Its headquarters building is tucked along the side of the main quad of the NASA Research Park in Mountain View, Calif. The historic Hangar One, which Google will soon take over day-to-day operations from NASA, hulks over Moffett Federal Airfield just beyond the quad. Walk a few blocks away and you reach SU's classroom, where large windows and a high ceiling contrast the old mission feel of the main building.

Photo by Signe Brewster

A prototype for a robotic elephant is passed around the audience at the SU executive program.

The outdoor areas of the research park are nearly abandoned, but SU's headquarters stir with some activity. Startups like health device maker Scanadu and micro-gravity 3D printing pioneers Made in Space make their home in its halls.

SU is not an accredited university, but its atmosphere is certainly collegiate. Interactions between the executive program participants were chummy. SU summer program graduates speak of their classmates with a distinct fondness; at SU, they've finally found peers with the same interests.

CEO and associate founder Rob Nail, who is also an angel investor and director of adventure goods company Alite Designs, said that when someone attends an SU educational program, the school has three goals for them. First, the experience should fundamentally change their perspective on the future of technology and the role it will play in shaping the future of Earth.

"We call it exponential thinking: actually look at the accelerating pace of technology instead of the very linear one that we're

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historically schooling and everything is based on," Nail said. "They leave here fundamentally thinking that the future looks different than when they came in."

Second, they should take note of and be prepared to use the resources offered by the world and SU. Third, SU wants to empower them to play a role in the future and think at scale.

"There are plenty of people that will make lots of money making small apps to do nonsensical things, whereas that same capability could be used and deployed to target curing cancer or solving other different types of problems that could be much more meaningful on the planet using basically the same types of skills," Nail said. "It's just a mindset to strive for higher order problems."

The goal is that people eventually come back with an idea that fulfills all of these criteria, some of which will fit into SU's start-up accelerator program.

Spotting startups that look into the far future

SU currently has 24 startups in its accelerator, most of which were founded by at least one SU program alumnus. Their start-up might be focused on an idea generated at SU or outside in the real world.

Managing director of new venture development Sandy Miller said that all of the startups focus on a grand challenge, but their commercial product isn't necessarily decades away. Made in Space, for example, will send its 3D printer to the International Space Station this year. It formed just four years ago.
Made in Space's printers are rugged, as they have to survive the launch into space.

Or take Modern Meadow, which was founded with the goal of making lab-grown meat and leather. While producing tasty, edible meat is still a way off, the company is already drawing close to commercializing its leather. It will start with the high-end fashion market and then move into the auto industry.

The key, Miller said, is for the startups to be at least one or a few years ahead of the market.

"Be ahead, but not so far ahead you can't even see the dot in the distance," Miller said. "The U.S. Department of Agriculture, the FDA, they probably haven't started to think about how they're going to regulate the meat Modern Meadow is starting to develop now."

That kind of frontier appears again and again in SU's portfolio. There's Cambrian Genomics, which prints DNA with equipment cheap enough for anyone to afford. There's the Glowing Plant project, which hacks a plant's genes to make it naturally glow. These advancements are happening now, and they're not about to wait for the rest of the world to catch up.

"We have those fun examples from science fiction, from TV that some of us grew up with, where you push a button and a meal pops out of your TV," Miller said. "This starts to put some of those things together. That dot so far on the horizon, that possibility, starts to become closer."

Photo by Signe Brewster

Singularity University's classroom on the NRP campus.

Taking a responsible look at the future

All of the projects coming out of Singularity-affiliated companies have a mad scientist quality to them. But once they reach the hands of other mad scientists, will they be used for good or for evil?

Nail said it's a question that plagues him. He's concerned by drones and weapon-carrying robots. He's also afraid of technology that is under the radar enough to escape regulation and public discourse.

"I'm very excited and happy to showcase companies like Glowing Plant, but I'm also very concerned about companies like Glowing Plant because of the inevitabilities of someone taking that similar technology and doing far more reckless and terrible things," Nail said.

It's an odd fear to come from someone wearing Google Glass; a mark of a confident hyper-early adopter. But his next point clarifies the contradiction: the early adopter is aware, and has the power to shape the dialogue and experience for later users.

Nail said when SU associates itself with a project like Growing Plant, it uses it as a vehicle to incite awareness, including controversy. SU wants people to weigh the positives and negatives, and maybe help drive what level of regulation new technology needs to have an overall positive effect on the world.

"How do we start that discourse amongst politicians, amongst citizens and amongst corporate groups so we can figure out what future we want to live in?" Nail said. "That's what I keep coming back to. These technologies keep coming out. They're not going to stop. They're going to take us some place and

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either we're going to be surprised by it or we're going to direct where it goes."

Making the future

Back on stage, one of SU's newest methods for fostering that discourse is on display. Under the new SU Corporate Innovation Exchange, SU Labs startups can pair directly with corporations, the founding members of which are Coca Cola, Lowe's, Hershey's and UNICEF. The startups can develop a new product for a corporation or provide a fresh take on an existing product or service.

Then the SU Labs startups come on stage. One by one, they talk making engineering genes easy enough for anyone. They pitch altering pet cats' gut bacteria so that the litter box smells like banana or mint. They explain how technology could eradicate organ shortages for people who need implants.

They aren't overwhelmed by worries they will enable the wrong people to create mutant organisms. They're more excited about the potential for good. And with SU at their back, we can hope citizens, corporations and governments see that kind of potential too.

Singularity University's 2014 Graduate Studies Program (GSP) Opening Ceremony

Photo source: Singularity University

The ten-week summer program was Singularity University's first offering six years ago, and it remains at the heart of Singularity University's mission today—to use technology to positively impact a billion people in the next ten years. The incoming summer class includes 80 talented, accomplished, and driven GSP participants from 40 countries.

Meet reqallable, the Smartwatch App that Rescues You from Notifications Overload

by Jon Phillips, TechHive
January 31, 2014

Smartwatches usually treat notifications with blunt-force indiscretion. It's an all or nothing affair. You either turn off notifications entirely, letting your wrist wear go quiet, or you leave notifications on, and let the watch respond to all incoming signals with a buzz or a chime.

The first option defeats everything we want in a smartwatch—these gadgets are supposed to save us the trouble of checking our phones for critical communiques. But the second option is annoying—once those emails, text messages, and call notifications pile on in rapid succession, you want to throw your watch down the sewer.

But perhaps help is on the way. A company called reQall has just ported its reqallable smartphone app to Sony's Smartwatch platform, promising algorithmic relief for notifications overload. Available now on Google Play, the app hooks directly into your calendar, contacts list and even geolocation to determine where you are, what you're doing, and who's important to you—and then it decides whether to elevate that next notification to something you need to know about *right now.*

If you've ever suffered the pain and embarrassment of an overactive smartwatch, you can see reqallable's utility. But one of the things that's most noteworthy about reqallable's Friday app launch is that it's a *smartwatch* app launch. You know the

Photo source: TechHive

reQall's reqallable smartphone app on Sony's Smartwatch

developer community is taking these gadgets seriously when someone makes a big to-do about a piece of software that only works on a device that, quite frankly, very few people use.

"Wearables are an important market to be in," says Sunil Vemuri, reQall co-founder and chief product officer. "People are asking, 'What are we going to use smartwatches for?' and we think we have an answer for that. This is the beginning of a story, and we want to be part of that beginning."

reqallable cont'd on page 17

Cyber Firms Look to Move the Electrical Grid

By Mohana Ravindranath, Washington Post
April 27, 2014

At a keynote speech in Washington last month, former CIA director Leon E. Panetta warned that cyberspace is the "battlefield of the future." Hackers could trigger disruptions similar to those caused by Hurricane Sandy if they gain access to electricity grids, transportation systems or other networks, he said.

Warnings like Panetta's have created new opportunities for cybersecurity technology companies that once focused on computer networks. Many are looking to adapt their software to help protect other industries.

For instance, M2Mi — which stands for machine-to-machine intelligence — began eight years ago as a project out of the NASA Research Park in Moffett Field, Calif. The firm works with telecommunications companies to make sure that the devices that make up "the Internet of things" — a web of connected devices and sensors — can easily exchange information over a network.

M2Mi is turning its attention to the electrical grid. It has been working with the Smart Grid Interoperability Panel, a nonprofit group that began as a project about four years ago, funded by the Energy Department and the National Institute of Standards and Technology, to make sure its software meets the requirements of the electric utility industry. The panel draws up standards and practices to ensure that the devices, sensors and meters that make up the electrical grid can communicate.

"Most [tech companies] are trying to bring in business solutions, most of which have started out doing either security capabilities or cybersecurity from a different industry perspective, and then looking at how it applies to the smart-grid space," said Patrick Gannon, the panel's executive director.

Utility companies have been using M2Mi's software to manage the information collected from various points in the electrical grid: the data transmitted from an energy sensor to a consumer's "smart" meter, which might display the amount of energy consumed in an hour and its price, to the energy provider's main data center and vice versa.

The software uses a lockbox system that grants authorized devices unique "keys," allowing them to participate in that information exchange. A consumer's smart meter may be granted one such key. An attack on the network can be traced to a particular user or device, chief executive Geoff Brown said.

M2Mi is not alone in looking for work across sectors. Utility companies make up about 80 percent of customers for the analytics firm Space-Time Insight, based in San Mateo, Calif. But other customers are companies in oil and gas, telecommunications, and transportation. Customers pay a software-licensing fee for the service.

Space-Time Insight's system collects data from weather sensors, energy meters, security cameras and other sources to establish baselines, and immediately alerts administrators in case of an abnormality. The system also correlates abnormalities in data streams to triangulate the source of an intrusion — an irregularity caught on a video feed, or an unauthorized attempt to join the network, might be linked to a slowing of the network, for instance, said Steve Ehrlich, senior vice president of marketing.

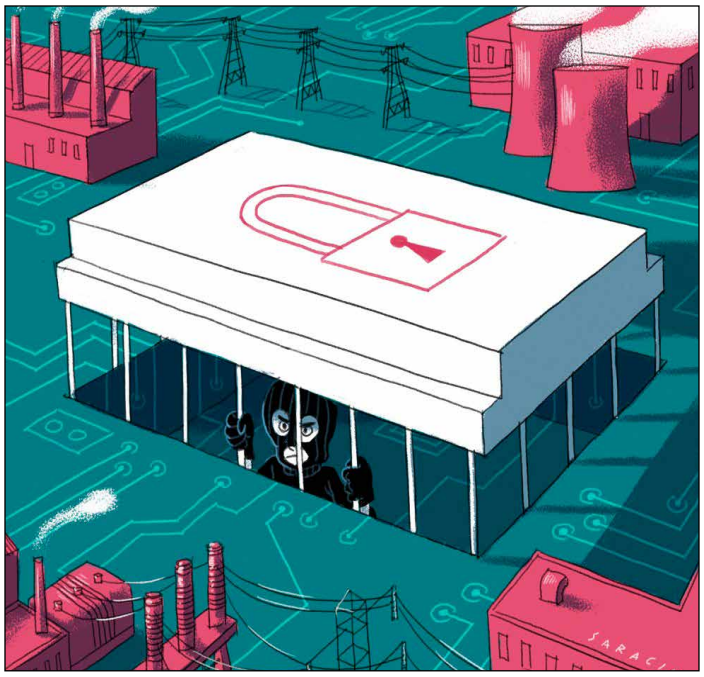


Image source: David Saracino/The Washington Post

Crossing industry lines can be tricky. In the smart-grid panel's discussions with utility companies, Gannon said, he learned that although their concerns are similar to, say, the financial industry — detecting malware and viruses and encrypting data transmissions — "there is the added dimension [in the electrical grid] of the machine-to-machine interaction between autonomous devices that becomes a little more unique."

Also, the utility industry tends to move slower on adopting new technology because of the way it is regulated, Gannon said. Most utility companies must undergo a formal rate-making process, during which they decide how much to charge consumers, so it's rare for them to try out new technologies if it affects that process.

"It's a much longer business cycle," Gannon said.

Navigating that process can be tough for investors hoping for timely returns. As a result, investments may be slowing. According to data from Mercom Capital Group, a global clean-energy communications and consulting firm, venture funding for smart-grid companies reached $405 million in 2013, compared with $434 million in 2012.

Still, the Energy Department is actively searching for cybersecurity solutions for the electrical grid. In April, the department put out a research call for technology related to defending against moving targets, securing distributed energy resources that do not rely on a central power plant, and self-healing control systems for delivering energy.

Dr. Sarah Cooper from M2Mi Recognized in Connected World Magazine's Exclusive 2014 Women of M2M List

PRWEB
March 21, 2014

Machine-To-Machine Intelligence (M2Mi) Corporation today announced that Dr. Sarah Cooper, Vice President of Business Development, has been recognized by Connected World Magazine in its 2014 Women of M2M list. The Connected World Magazine 2014 Women of M2M list recognizes women at the forefront of moving the connected industry forward. The list includes women who are moving their respective companies towards a common goal of bridging the gap between people and machines.

Dr. Sarah Cooper, VP Business Development, has built a strong track record of delivering M2M and IoT products and solutions to Fortune 500 customers and partners. Sarah, has been instrumental in pioneering the first plug and play public cloud M2M and IoT ecosystem with the M2M Intelligence® platform, including M2Mi's Cyber Security products anchoring a rich set of global, multi-industry partners.

Sarah is well recognized in the industry. She is a winner of NAE Young Engineers Award, the Nano50 Award, and is a Sir Keith Murdoch Fellow as well as a Silicon Valley Power Fellow. She holds 6 US patents and completed her PhD in Physics from the University of Sydney.

Sarah is an inspiration, mentor and advocate of women throughout the technology and entrepreneurial sectors, from semiconductor to food tech to consumer wearables. A member of Society of Women Engineers (SWE), a regular participant in Bay Area Girl Geek dinners and a supporter of talented women at every level of her M2M and IoT industry partners, customers and associations.

"We at M2Mi are glad to see industry recognition of something we have known for a while – that Sarah Cooper is an incredible asset, not only to our company, but the M2M and IoT industry. From an industry leadership perspective, Sarah has been instrumental in promoting the importance of M2M and IoT platforms, cyber security and intelligence from the platform. We are very proud of the incredible work that Sarah has consistently accomplished and congratulate her for a richly deserved recognition." says Geoff Brown, CEO, Machine-to-Machine Intelligence (M2Mi) Corporation.

Photo source: PRWEB

About Machine-to-Machine Intelligence (M2Mi) Corporation:

Machine-to-Machine Intelligence (M2Mi) Corporation delivers M2M Intelligence®; the essential platform for the M2M & Internet of Things economy. M2Mi reduces the complexity of connecting, provisioning and automating M2M services, as well as securely integrating edge devices through network providers to the cloud data center, thus addressing requirements for both critical cyber-physical infrastructure protection and secure information exchange.

Machine-to-Machine Intelligence (M2Mi) Corporation is headquartered at NASA Research Park, Silicon Valley.

Taksha University's Space Health Forum

Professor Joan Vernikos, PhD, and Stephan Blanc, PhD, with Professor Dilip Sarkar, MD, FACS, chaired a space health forum this spring, discussing hibernation, meditation, and sleep. Taksha hopes to host a follow-up conference at the NASA Research Park. This workshop will provide cross-fertilization of ideas from research on a variety of low-energy states with the object of discovering ways of supporting the health of space travelers on long-duration missions. The discussions and recommendations will be recorded and compiled for publication, to provide a landmark document to initiate follow-on discussion and exploration in this new field.

Taksha will offer a Systems Engineering Management (STM510) course with Prof Wilson Felder, PhD, this winter at the NASA Research Park.
Please email contact@taksha.org for more information.

Photo source: Taksha

Professor Joan Vernikos (and former NASA Associate Administrator) chairing the 3rd International Space Health Forum (ISH3).

Rhombus Power's First Product, Mercury, is a Networked, Scalable, Digital, and Highly Accurate Neutron Detector

www.azosensors.com
May 16, 2014

Rhombus Power Inc.'s first product, Mercury, is a networked, scalable, digital, highly accurate, and easy-to-use neutron detector. Mercury can be readily used by homeland security, defense, and intelligence communities to detect contraband nuclear weapons and materials. The National Institute of Standards and Technology (NIST) has independently verified that Mercury meets ANSI standards.

Mercury is being demonstrated in Gaithersburg (MD) on May 29th at the U.S. Department of Commerce's National Institute of Standards and Technology (NIST) to a number of U.S. Government agencies. An earlier prototype of Mercury was successfully demonstrated in December 2013 at UC-Berkeley to scientists and U.S. Government agencies.

President Obama and his national security team continue to rate nuclear terrorism as a high priority threat to our homeland. At the 2014 Nuclear Security Summit in The Hague, in response to a question about his concerns over deteriorating US-Russian relations, he said, "I continue to be much more concerned, when it comes to our security, with the prospect of a nuclear weapon going off in Manhattan."

According to Rhombus CEO and Founder Dr. Anshuman Roy, "Currently deployed nuclear detectors are unreliable because they are inaccurate and require frequent calibration. And the world has run out of Helium-3 that served as the workhorse neutron sensing material for decades."

To address this critical national security need, Dr. Roy left a research position at UC Santa Barbara in 2012 to start Rhombus Power. Dr. Roy and his Rhombus team joined the NASA Research Park (NRP) at NASA Ames Research Center in Silicon Valley.

Photo source: Rhombus

Nobel Prize winner Dr. Alan Heeger and Rhombus CEO and Founder Dr. Anshuman Roy.

Photo source: Rhombus

Rhombus' neutron detector (Mercury).

According to Nobel Prize winner Dr. Alan Heeger, "Rhombus' neutron detector (Mercury) will make America safe from terrorist movement of fissionable materials. It is 10x more accurate than available solutions and it is free of false positives that plague existing technologies – it is a breakthrough innovation."

Rhombus has provided detectors to the nuclear science departments at the University of California, Berkeley, and San José State University for characterization. According to Dr. Kai Vetter, Professor of Nuclear Engineering at UC Berkeley, "Mercury is an on/off detector for neutrons that does not require calibration and is free of false alarms." Dr. Gilles Muller, Director of Nuclear Science at San José State University commented, "We are delighted to facilitate the characterization experiments of Mercury at our Nuclear Science facility."

Mercury also has scientific applications in digital neutron imaging for drug discovery and materials science as well as commercial applications in oil & gas, lumber and agriculture markets. Dr. Roy is very excited about the broad applicability of this breakthrough technology that he predicts will require major expansion of his company and number of employees.

NASA Research Park Director Michael Marlaire noted, "We are so proud that yet another of the NRP startup companies has developed a platform with so many potential benefits to the American people". The NRP is pursuing the White House goals, "Accelerating Technology Transfer and Commercialization of Federal Research in Support of High-Growth Businesses", as expressed in the October 28, 2011 Memo to Heads of Executive Departments and Agencies. Over the years, NRP has successfully incubated businesses that started with only intellectual property and a plan, and now employ thousands in Silicon Valley, including Bloom Energy, AlterG, Apprion, and Benetech.

Made In Space 3D Printer Gets Green Light from NASA for Launch

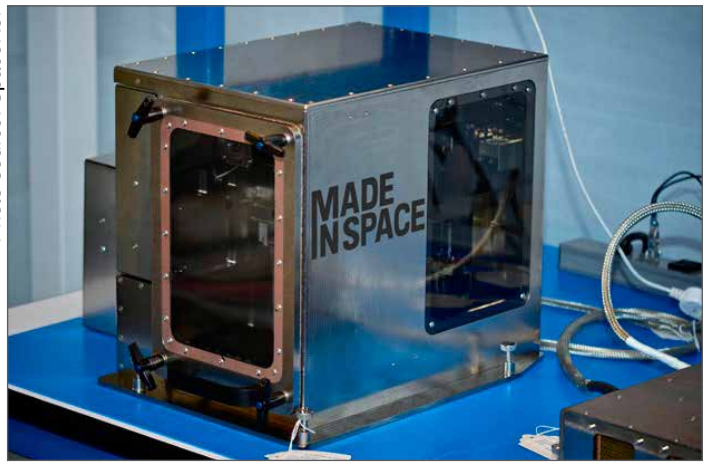
By Marc Boucher, SpaceRef
April 27, 2014

After passing the last NASA test, Made In Space will see its 3D printer launched to the International Space Station (ISS) in August by SpaceX as part of NASA's 4th Commercial Resupply mission (CRS-4).

Originally the 3D printer was scheduled to fly on the SpaceX CRS-5 mission but because the company met all its milestones early the launch was moved up to CRS-4.

"NASA was able to provide key guidance on how to best comply with strenuous space certification, safety and operational requirements and Made In Space excelled at incorporating that insight into the design," said Niki Werkheiser, the NASA 3D Print Project Manager. "As a result, the hardware passed testing with flying colors. Made In Space now has first-hand experience of the full 'A-to-Z' process for designing, building, and testing hardware for spaceflight."

Photo source: SpaceRef



Made in Space 3D-printer.

Once in space, the 3D printer will be installed in the ISS Microgravity Science Glovebox (MSG) and will print an initial set of 21 demonstration parts including a series of test coupons, parts and tools. The data from these demonstrations will be downlinked high-definition video and the items will returned to earth for detailed ground analyses.

"Years of research and development have taught us that there were many problems to solve to make Additive Manufacturing work reliably in microgravity. Now, having found viable solutions, we can welcome a great change -- the ability to manufacture on-demand in space is going to be a paradigm shift for the way development, research, and exploration happen in space," said Michael Snyder, Lead Engineer and Director of R&D for Made In Space.

According to Made In Space the "first set of prints will serve to verify the printer and extrusion process in microgravity. The next phase will serve to demonstrate utilization of meaningful parts such as crew tools, payload ancillary hardware, and potential commercial applications such as cubesat components."

Photo source: SpaceRef

Noah Paul-Gin (left), Microgravity Experiment Engineering Lead, tests three Made in Space 3D printers in microgravity with team members Jason Dunn (center) and Mike Chen.

Should the demonstrations prove successful the company plans to put a permanent Additive Manufacturing Facility (AMF) on the ISS.

For NASA the the ability to create 3D printed items on-demand will reduce the need to launch parts from Earth which will save time and money.

Other companies like Planetary Resources and Deep Space Industries also have in their business plans the use for 3D printers in space to help reduce costs.

Made In Space plans on making their AMF 3D printer available for use by researchers, businesses and individuals. For companies interested in 3D printing in space this new testbed could be prove to be a great research opportunity as they develop their own industrial scale 3D printers.

Photo source: SpaceRef

Expedition 8 Commander and Science Officer Michael Foale conducts an inspection of the Microgravity Science Glovebox.

High-Speed, Elevated, Mass Transit Gets Real

skyTran Press Release
June 23, 2014

skyTran and Israel Aerospace Industries (IAI) to Build a skyTran Demonstration System

skyTran Inc., headquartered at the NASA Research Park (NRP) near Mountain View, California, and Israel Aerospace Industries (IAI), a company headquartered in Lod, Israel, entered into an agreement today for the construction of a skyTran technology demonstration system (TDS) on the grounds of IAI's corporate campus. The agreement was executed by the Director of IAI's Lahav Division, Yosef (Yossi) Melamed and by skyTran CEO, Jerry Sanders.

skyTran is the developer of the patented high-speed, elevated, levitating, energy-efficient, skyTran transportation system. The skyTran system is a network of computer-controlled, 2-person "jet-like" vehicles employing state-of-the-art passive Mag-Lev technology. skyTran systems will transport passengers in a fast, safe, green, and economical manner. skyTran intends to revolutionize public transportation and, with it, urban and suburban commuting.

IAI is a world leader in the development and production of aerospace systems and aircraft. It has accumulated nearly half a century of experience in creating and supplying advanced systems for customers worldwide and it devotes substantial resources to research and development. IAI is also an investor in and purveyor of green tech products and solutions.

Jerry Sanders remarked, "The support afforded by IAI is a breakthrough for skyTran. IAI, as a world-class designer of aircraft and avionics, is the perfect partner to take skyTran from concept to construct." Yossi Melamed declared, "We are proud to be part of this exciting moment in transportation history and to host the first SkyTran system in our grounds. The TDS will

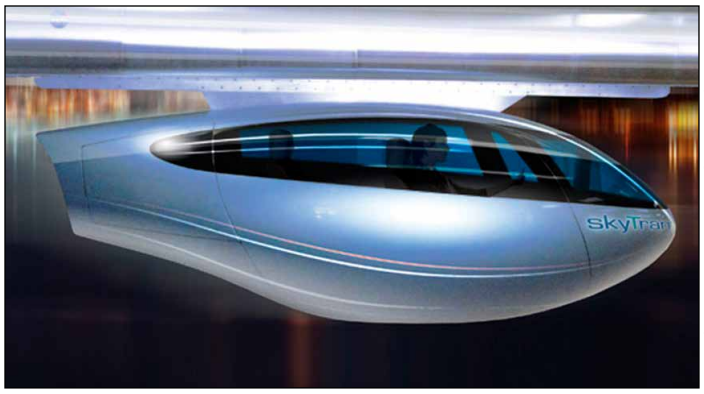


Image courtesy of: www.skytran.us

incorporate IAI's advanced capabilities in the areas of engineering, robotics, and control."

The TDS will incorporate skyTran's salient features. It will provide a platform for skyTran vehicles to travel at high speeds, with full payloads while levitating. The TDS will enable testing, refinement, and validation of skyTran's technology in a controlled environment.

The TDS will be followed by deployment of the first commercial skyTran system in Tel Aviv, Israel. Other projects worldwide are pending TDS completion.

In addition to being a tenant in the NASA Research Park, NASA and skyTran entered into non-reimbursable Space Act Agreements to collaboratively study "Human Habitability and Intelligent Control of an Advanced Transportation System."

"The NRP is proud to have skyTran as a valued tenant and partner in our world-class shared-use R&D and education campus for industry, academia, non-profits, and government," said S. Pete Worden, director of NASA's Ames Research Center, which founded and manages the NRP. "The NRP provides a physical place for innovation and entrepreneurship and serves as a technology accelerator through fostering both informal and formal collaborations."

PocketQube cont'd from page 1

test-beds, and novel satellite constellations that are inexpensive, redundant, and spatially organized.

The high energy workshop covered a number of topics, including:

- PocketQube Capabilities and Functions
- PocketQube Class Standard
- PocketQube Satellites Currently on-Orbit
- Designing and Building PQ Micro Spacecraft (Power Systems, C&DH, Payloads and cost, etc.)
- Licensing and Regulations (FCC, ITU, ITARU, NOAA)
- On-Orbit Ops and Analyses
- Launch Options and Opportunities
- Future Applications and Challenges

Presenters and facilitators included: Bob Twiggs, Professor, Morehead State University/Kentucky Space and former Director of the Space Systems Development Lab at Stanford University; Garrett Jernigan, Physicist, Little H-Bar Ranch (LHR), Eureka Scientific Inc., ESPACE Inc., Noqsi Inc., and Research Affiliate of KIPAC (SLAC/Stanford); Chantal Cappelletti, Professor Adjunto Universidade de Brasilia, International Academy of Astronautics Corresponding Member, Co-founder GAUSS Sri; Twyman Clements, Senior Space Systems Engineer, Kentucky Space LLC; Ben Malphrus, Director, Space Science Center, Morehead State University/ Space Tango LLC; and Kris Kimel, President, Kentucky Space LLC.

The Workshop was organized and sponsored by Kentucky Space LLC and Space Tango. The co-sponsors of the conference included NASA Kentucky, California Space Grant Consortium, Sonoma State University, NewSpace, and CASIS. The facilities and logistical support was provided by NASA Ames Research Center, which led to the success of the workshop.

NASA Taps Citizen-Scientists to Find Novel Ways to Use Earth Science Datasets

NASA/AP
June 25, 2014

NASA is well known as an innovator that employs some of the smartest people alive. This week, however, the agency announced two related Earth science challenges designed to take ideas from a much larger source: the public.

The challenges give citizens a chance to provide NASA with new ways to make use of the extensive datasets its Earth science satellites capture, much of which are available to the public through the Open NASA Earth Exchange, or OpenNEX. OpenNEX is a data, supercomputing and knowledge platform hosted on the Amazon Web Services cloud, where academics, developers and users can search through a massive collection of climate and Earth science datasets. NASA already collects the data, but the public could help the agency better figure out what to do with it.

"OpenNEX provides the general public with easy access to an integrated Earth science computational and data platform," said Rama Nemani, principal scientist for the NEX project at NASA's Ames Research Center in Moffett Field, California. "These challenges allow citizen-scientists to realize the value of NASA data assets and offers NASA new ideas on how to share and use that data."

The challenges come in two phases. The first is the ideation stage, which runs from July 1 through Aug. 1. It will offer as much as $10,000 in awards for ideas that lead to "novel uses of the datasets."

The second aspect is the builder phase and begins in August. It will build off the ideas generated during the ideation stage and will offer between $30,000 and $50,000 in awards for the development of applications or algorithms that promote climate resilience using OpenNEX datasets.

NASA/AP

NASA will announce the winners in December. The OpenNEX challenges also address policy mandates on big data, open data and climate data from the Obama administration, but bringing innovation from outside the agency is likely where its biggest efforts will lie.

Speaking at the Amazon Web Services symposium in Washington, D.C., on Wednesday, Tsengar Lee, program manager in the Earth Science Division of the Science Mission Directorate at NASA Headquarters, said building the data simply isn't enough: The agency wants to maximize its uses.

"The expectation was if you build the data, they will come, but that was not the case," Lee said.

To educate citizen-scientists on how datasets on OpenNEX can be used, NASA has created a series of online lectures and modules. Those materials, as well as other information on registering for the challenges, are available here:

https://nex.nasa.gov/nex/static/htdocs/site/extra/opennex/

International Space Development Panel in Los Angeles, CA

Dan Rasky and Bruce Pittman of the Space Portal at the International Space Development Conference in May, 2014.

Panelists included Bob Richards of Moon Express, Chuck Lauer of Rocketplane Global , Rick Tumlinson of Deep Space Industries, Will Pomerantz of Virgin Galactic and Jeff Greason of XCOR.

Photo courtesy of the National Space Society

FAA-Approved UAV Flight Operations in Alaska Without Visual Observers

By Dr. Stan Herwitz, UAV Collaborative

The NASA Marginal Ice Zone Observations and Processes EXperiment (MIZOPEX) Project involved the use of Unmanned Aerial Vehicles (UAVs) equipped with varied payloads for the investigation of the spatial and temporal variability of ocean and ice conditions in and near the marginal ice zone during the melt season over the ocean north of the Alaskan coast. The operational flight plan for the UAVs consisted of low flight heights (<2,000 ft MSL) at slow cruise speeds over considerable distances (>10 miles) from the takeoff and landing site at Oliktok Point. The use of ground-based visual observers or a manned chase planes for sense and avoid was deemed both impractical and a high risk within this framework of UAV flight operations. In the FAA-approved Certificate of Authorization (COA) that made it possible for NASA to conduct UAV flight operations in the domestic National Airspace at this location, the "Sense and Avoid Safety Procedures" section specified that a Thales-Raytheon Systems (TRS) Sentinel AN/MPQ-64 (FRP-5) radar data feed would be linked to a SAVDS® display system housed in the UAV Ground Control Station (GCS). The Sentinel-SAVDS Ground-Based Sense-and-Avoid (GBSAA) System served the time-critical function of showing the location and altitude of airborne targets (including non-cooperative aircraft not equipped with transponders) within and around a pre-defined transit corridor that was to be followed by the UAV en route to International Airspace. The accomplishment achieved by NASA as a critical element of the MIZOPEX Project was the successful field installation and field use of the Sentinel-SAVDS GBSAA System, enabling the first FAA-approved civilian UAV flight operation in the domestic National Airspace without airborne or ground-based visual observers. Historically, all previous FAA-approved COAs enabling civilian UAVs to operate in the National Airspace have required the use ground-based visual observers or manned chase planes as a means of maintaining safe separation distances between the UAV and other aircraft. It is envisioned that the future of UAV flight operations on the North Slope of Alaska and other comparable locations will increase significantly over the next decade for resource exploration and science. Within this framework, the Sentinel-SAVDS GBSAA System could be envisioned as enabling FAA-approved UAV flight operations without ground-based visual observers or manned chase planes.

SAVDS, Inc. has worked closely with ThalesRaytheonSystems LLC Company (TRS) for almost a decade, acquiring extensive datasets during UAV flight operations. Airspace monitoring for UAV flight safety has been achieved with the high-performance Sentinel radar providing the "eyes" and SAVDS® providing the "brains" of the GBSAA System.

The Sentinel-SAVDS GBSAA System provides UAV pilots with an integrated UAV-centric situational awareness of the 3D airspace: (1) detecting and tracking airborne traffic in relation to

SAVDS cont'd on page 19

Carnegie Mellon Wireless Researchers Seek to Improve Emergency Alert Messaging

CMU-SV
April 4, 2014

Researchers at Carnegie Mellon University's Silicon Valley campus (CMU-SV) have received an 18-month, $874,000 grant from the Department of Homeland Security (DHS) to study how wireless technology can be improved to generate more informative emergency alerts. Additionally, they will explore if mobile devices can filter these messages based on an individual's location and needs.

When severe weather, terrorist threats or other emergencies occur, government officials alert the public by sending text messages to smartphones and other mobile devices that are enabled to receive wireless emergency alerts (WEA). These brief, 90-character messages aim to protect the public, but they also have also generated confusion and frustration by not providing enough information and by alerting large numbers of people who are not immediately affected. Thus, it is common for individuals to block these warnings.

Image source: CMU

Martin Griss, founding director of the campus' Disaster Management Initiative (DMI); Bob Iannucci, associate dean of the College of Engineering and director of the Silicon Valley campus, and Hakan Erdogmus, associate teaching professor of electrical and computer engineering, are heading the team that will study issues surrounding the creation, dissemination and reception of emergency messages and how first responders and the public react to different types of messages.

The team proposes to improve targeting messages by developing and piloting a prototype app that relies on a smartphone's ability to determine a user's location and movement patterns. A test bed system will simulate an emergency message's life cycle, from its creation and distribution to users' phones. This test bed will enable the team to explore a variety of scenarios and technologies. The more successful scenarios will be tested with public volunteers.

CMU Alerts cont'd on page 16

One Small Step for NASA, One Giant Leap for RMV!

RMV
April 4, 2014

On 4 April 2014, Jeannette Plante, Project Manager, NASA Goddard Space Flight Center, Space Mission Assurance Directorate and Gene Monroe, Mission Assurance Manager, NASA Langley Office of Safety and Mission Assurance, presented a very special award to Bob Vermillion, SME on Electrostatic Discharge (ESD) Control for his unprecedented 'hands on' training that included Suspect Counterfeit Training for Incoming Inspection of 6 out of 10 NASA Centers, NASA Safety Center and Jet Propulsion Laboratory.

Photo source: RMV

Under the leadership of Gene Monroe, MSEE, NASA Langley, and, after months of preparation, the ESD SMEs from several NASA centers developed into a working collective of team building and comradery throughout ONE ESD NASA.

Photo source: RMV

The ESD program managers are all exceptionally qualified, accomplished engineers and real team players. The representative of JPAC (Joint Planning Auditing Committee) that reports directly to NASA Headquarters participated in the training.

Moreover, NASA Goddard had the opportunity to continue training at a prime contractor, Space Science Laboratory (SSL) at UC Berkeley and interact with SSL engineers/scientists during the team assessment of mission assurance areas.

Photo source: RMV

Assessments were also conducted for NASA Ames cleanrooms and assembly areas orchestrated by the NASA Ames Mission Assurance Director.

Sites in attendance included NASA Langley, NASA Armstrong, NASA Goddard, NASA Stennis, Jet Propulsion Laboratory, NASA Marshall, NASA Glenn, NASA Kennedy and NASA Wallops.

All of the ESD program managers attending the course truly represent the best ESD Program Managers on Earth!

Photo source: RMV

RMV Technology Group LLC, a NASA Industry Partner, is a Service Disabled Veteran Owned Business (SDVOSB), SBA 8(a) and SDB firm. Bob Vermillion, CEO/Founder, is a Subject Matter Expert in Advanced Materials, Protective Packaging, Aerospace Materials Testing Laboratory and Training Center, Systems Level Test and Evaluation Lab, Suspect Counterfeit Identification, Mitigation and Avoidance Training and ESD/EMC Engineering Services Company. Bob Vermillion, CEO/Founder, RMV Techology Group is an Industry Leader, Speaker and Author. Onsite at NASA Research Park, 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 suppliers and partners.

Please visit RMV Technology Group LLC at www.esdrmv.com. Call Renee Mitchell at 650-964-4792 or renee@esdrmv.com or Bob at bob@esdrmv.com.

Plasma Drilling on Mars

By Pascal Lee, Chairman - Mars Institute

The Mars Institute is collaborating with Norwegian company Zaptec Inc. in the development of a new plasma drilling technology with applications to the Moon, Asteroids, Mars, and Mars's moons, Phobos and Deimos. Plasma drilling is probably the only practical way of accessing deep-seated liquid water, and therefore potentially extant life, on Mars today.

Robotic missions to Mars and recent modeling of the chemical evolution of the Martian surface suggest that Mars's surface and shallow subsurface (down to several meters) is likely sterile, in large part due to the abundant presence of chemically aggressive compounds such as peroxides and perchlorates. Meanwhile, the identification of any signature of life on Mars as being truly alien (as opposed to resulting from meteoritic importation from Earth, or being ancestral to Earth life), will likely require genetic ID-ing at the molecular level, i.e., it will likely require that extant microorganisms be found. The latter will most plausibly require that liquid water be accessed and analyzed, i.e., that deep drilling down to depths of hundreds of meters to several kilometers be achieved on Mars.

Traditional drilling techniques used on Earth are difficult to apply in space, generally because of their prohibitive requirements in equipment mass, volume, and power, and their common reliance on gravity and on the continuous circulation of liquid H2O-based drilling fluids to lubricate the drill bit and flush out cuttings. While traditional drilling approaches may remain adequate for shallow drilling (down to depths of a few meters), they are impractical for planetary deep drilling.

Zaptec, Inc., based in Stavanger, Norway, is currently developing a plasma drilling system that will circumvent these obstacles. The drilling system comprises a freely advancing drill head tethered by a power cable to a power source topside and high voltage generator downhole. The drill advances by generating a high-energy density plasma at the drill head which breaks down and pulverizes the target rock. A key enabling technology is the system's ability to deliver high-energy plasma discharges via low mass, small volume power transformers located in the drill head. Powder cuttings may be removed by circulating compressed carbon dioxide, a fluid that's abundantly available on Mars. The Zaptec plasma drilling system will allow a depth of 2 km to be reached on Mars with less than 1 metric ton of surface payload housed in a SpaceX Dragon-sized capsule, and peak power requirements of less than 2 kW [Fig.].

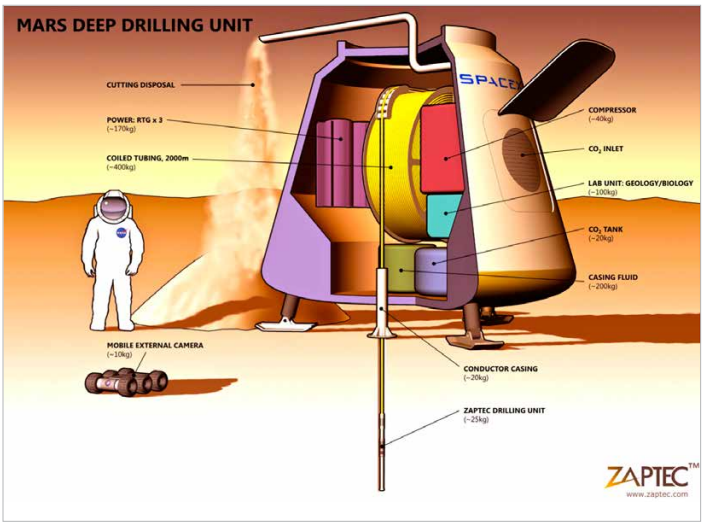


Image source: Zaptec Inc

Figure: Zaptec Inc.'s plasma drilling system will be capable of reaching a depth of 2 km on Mars, deployed from a SpaceX Dragon-class landed capsule. Astronaut is shown for scale. The Mars Institute is a science and technology partner in the maturation of this concept for planetary exploration.

Field testing of a Zaptec plasma drilling prototype is anticipated to take place in the near-future, including possibly at the Mars Institute-managed NASA Haughton-Mars Project site on Devon Island, High Arctic. Performance evaluation will be conducted in collaboration with NASA Ames Research Center. If this approach is successful, reaching deep subsurface aquifers on Mars and possibly encountering extant alien life in them, might no longer be that far off in the future.

CMU Alerts cont'd from page 14

"What we hope to deliver through our work is an approach to greatly improve the precision in targeting and relevance to the recipients of these messages, so that they are more likely to act as intended on the warnings, with less 'opt out,'" Griss said.

CMU-SV's DMI and its related CyLab Mobility Research Center are centers of excellence for research and dissemination of technical solutions to emerging challenges in all-hazard disaster management worldwide. The new DHS project builds on CMU's previous work in emergency response technologies, such as "CAPCreator," a Web-based tool set that makes it easy to author Common Alerting Protocol (CAP) messages that pass through the government's Integrated Public Alert and Warning System (IPAWS) infrastructure, then on to a wireless operator, such as Verizon or AT&T, and eventually to users' cellphones as WEA messages. Researchers will use CAPCreator to route messages in the test scenarios.

Another companion project is the Survivable Social Network, a neighborhood-based network that provides small groups or nodes of neighbors with social networking communications on their smartphones that are accessible during emergencies.

"With the latest LTE-based 4G wireless technology and widespread adoption of powerful smartphones, there are both new opportunities and challenges in engineering and deploying these highly distributed mobile systems across the nation," Griss said. "We have to develop systems using new system engineering methods and tools, such as context-aware mobile applications, open-source software and cloud computing."

Other Carnegie Mellon researchers participating in the DHS project include Joseph Elm, Software Engineering Institute program integration manager; Cécile Péraire, teaching professor of Software Engineering; and graduate students in the Electrical and Computer Engineering program at CMU-SV.

reqallable cont'd from page 7

Just how 'important' are you?

For reqallable to work, you have to let it penetrate the nooks and crannies of all the personal information you store on your handset. But once you grant those permissions, the system becomes aware of your personal relationships and daily activities to make its decisions on which notifications you receive on your watch, and which notifications it keeps quietly confined on your phone.

The concept of a person's "importance" is key to reqallable's logic. For example, if your husband or wife sends you an email or text, that communication will pass reqallable's threshold, and you'll get a notification on your smartwatch. Why? Because the system might have seen you flag your spouse as a favorite in your contact's list. Or because it recognizes you email each other all the time. Or even because you share the same street address.

But then there's also the concept of "temporary importance." During his demo of the smartwatch app, Vemuri showed me how I, a virtual stranger, was briefly elevated to VIP status.

"Because you're on my calendar for this meeting, your importance is elevated. That's relevant because if you were to message me today, I'd want that to come to my attention," Vemuri says. "But your importance will decrease tomorrow unless we have a continuing email exchange. We're looking at the calendar, the contact list. We're looking at the call log. All that gives an indication of who is important and who is not."

The system is also sensitive to your location and daily activities. It can determine that you're driving by sensing rapidly changing geolocation, and then suppress distracting notifications accordingly. Likewise, it can determine when you're sleeping by looking at your phone's idle times, as well as the time of day.

Photo source: TechHive

Vemuri showed me how my emails passed reqallable's threshhold because I temporarily became an important person. Two other messages, as you can see, were suppressed.

And then there's sensitivity to social etiquette. The reqallable system can dip into your calendar, and suppress notifications from all but the most "important" people so you're not bothered during a critical business meeting. Says Vemuri: "The ultimate goal is to help modulate what we have in these devices, so that phone knows, 'Right now, this is not a good time for an interruption.' It knows that I'm busy. But when I leave here, it might buzz me and tell me, 'These are the things that happened while I was busy.'"

Why read 500 words when 50 words will do?

Even if perfectly filtered notifications don't realize your smartwatch dreams, you might still appreciate reqallable's ability to parse long email messages, and then push heavily edited versions that surface only the most attention-worthy details to your smartwatch. "We have an algorithm that goes through the message sentence by sentence, looking for typical phrases that indicate some type of response is needed, or that there's some type of important communication going on," Vemuri says.

During his app demo, Vemuri showed me a long, multi-paragraph message on his phone, and then pivoted to the smartwatch app, which reduced that very same email to three critical action points: "Please let me know if the above description is OK," "Are you available to meet?" and, "Please let me know some days that work for you."

Based on what I saw, the machine intelligence looks pretty incredible. And the reqallable smartwatch app even lets you quickly reply to these email snippets with pre-formatted responses like "This is fine," "Please call," or "Let's meet." It's a convenience feature that would be useful in a lot of Sony Smartwatch apps.

Now, about Sony's smartwatch platform, which graduated to Smartwatch 2 hardware late last year: Why did reQall choose Sony's technology instead of the much more ballyhooed (though not necessarily deserving) Samsung Galaxy Gear? "To be frank, Sony's APIs are most mature," Vemuri says.

That's not a ringing endorsement of Sony's hardware, and during our meeting, I had to grill Vemuri on why his company is releasing an app into an ecosystem with such a small installed base. The app appears to be more of a fully-functioning proof-of-concept than anything people will actually use—if only because so few people actually use smartwatches, let alone Sony's.

I poked and prodded, but Vemuri wasn't having it. "There's a lot that can be improved in what we're seeing in smartwatches today. It's eventually going to happen, and it's unclear who will be the winner, and we're not trying to bet on which horse is going to be the winner. But our technology will help elevate those who sell smartwatches—and those who have them to make better use of them."

Google Lunar XPRIZE Selects Five Teams to Compete for $6 Million in Milestone Prizes

February 19, 2014

The Google Lunar XPRIZE announced today the five international teams selected as finalists for Milestone Prizes, with a total purse of $6 million to be awarded this year. After reviewing 33 total submissions, the nine member independent judging panel selected 11 submissions from the following teams: Astrobotic (US), Moon Express (US), Hakuto (Japan), Part-Time-Scientists (Germany), and Team Indus (India).

The Milestone Prizes were added to recognize the technological achievements and the associated financial hurdles faced by the teams as they vie for the $30 million Google Lunar XPRIZE, a global competition to land a robotic spacecraft on the moon by December 31, 2015.

The three categories of Milestone Prizes are as follows, along with which teams are competing:

- Landing System Milestone Prize: $1,000,000 per team - based on the hardware and software that enables a soft-landing on the moon (Astrobotic, Moon Express, Team Indus)
- Mobility Subsystem Milestone Prize: $500,000 per team – based on the mobility system that allows the craft to move 500 meters after landing (Astrobotic, Moon Express, Hakuto, Part-Time-Scientists)
- Imaging Subsystem Milestone Prize: $250,000 per team – based on producing "Mooncasts" consisting of high-quality images and video on the lunar surface (Astrobotic, Moon Express, Part-Time-Scientists, Team Indus)

In order to compete for the Milestone Prizes, teams had to submit documentation to the judging panel, defining the key technical risks they face and how they intend to retire them. Selected teams must now accomplish the milestones outlined in their submissions through testing and mission simulations under the scrutiny of the judges, in order to win the prizes. Teams have until September 2014 to complete the prize requirements and the winners will be announced on an ongoing basis throughout 2014.

"Every strategy presented to us was imaginative, forward-thinking and ambitious, which made it difficult to choose only a handful to proceed to the Accomplishment Round," said David Swanson, chair of the Google Lunar XPRIZE judging panel. "As there are increasing fiscal constraints threatening the ability of governments to fund exploration, the need to recognize the bold technical achievements of these privately-funded teams is greater than ever."

Competing for the Milestone Prizes is an optional part of the Google Lunar XPRIZE. Teams that chose not to participate in the Milestone Prizes are still eligible to win the Grand or Second Place Prizes. The prize money for the Milestone Prizes will be deducted from any future Grand or Second Place Prize winnings of that team. To accommodate the possibility of teams winning Milestone Prizes and not subsequently going on to win the Grand or Second Place Prize, Google has increased the maximum prize purse to $40 million.

XPRIZE is also considering additional Milestone Prizes for technical achievements after lift-off on the way to the moon, to be announced at a later date. For more details on the Milestone Prizes, please visit http://www.googlelunarxprize.org/prize-details/milestone-prizes.

About the Google Lunar XPRIZE:
The $30 million Google Lunar XPRIZE is an unprecedented competition to challenge and inspire engineers and entrepreneurs from around the world to develop low-cost methods of robotic space exploration. To win the Google Lunar XPRIZE, a privately funded team must successfully place a robot on the moon's surface that explores at least 500 meters and transmits high-definition video and images back to Earth. For more information, go to http://www.googlelunarxprize.org.

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Which is the Smartest City in America?

Today Show
January 24, 2014

Source: www.today.com

In its "Healthy, Wealthy, Wise" series, TODAY reveals that the U.S.'s smartest city is San Jose, Calif. More than half of adults there have a college degree, and young entrepreneurs are moving there in droves. The government has even put a patent office in a San Jose post office, a first in the country. NRP Partner Scanadu is featured in this segment.

Source: www.today.com

Watch the video at http://www.today.com

LatIPnet Invited by a Leading Colombian University to Help with Technology Commercialization Efforts

May 2014

Drs. Guillermo Aguirre and Adolfo Nemirovsky, founding members of LatIPnet Inc., were invited by the Pontificia Universidad Javeriana, a top Colombian University, to organize and lead a two-day technology commercialization workshop in Bogota in May 2014. The purpose of the workshop was to evaluate technologies developed by the university with external collaborators and to jointly analyze viable paths for commercialization in the global market including, in some cases, the launching of new ventures with global projection. Participants included professors, graduate students and the Innovation Directorate's team. Emphasis was placed in building partnerships with Silicon Valley, US and global entities to further pursue the development and commercialization of promising technologies and to enhance innovation efforts locally and in Colombia.

The Innovation Directorate (Dirección de Innovación, Vicerrectoría de Investigación) of the Pontificia Universidad Javeriana (PUJ) aims to contribute to the generation of a university innovation system leveraging local knowledge, transferring technology and building an entrepreneurial culture in the region and the country. The PUJ is a private higher education institution founded in 1623. It is one of the oldest and most prestigious Colombian universities with its main facilities in Bogota and a second campus in Cali.

Photo source: LatIPnet

Drs. Guillermo Aguirre (LatIPnet Mexico), Adolfo Nemirovsky (LatIPnet Silicon Valley) and Fanny Almario, (Director, Innovation, PUJ), 2nd, 5th and 3rd person from right, respectively, with the innovation and technology commercialization team at the Universidad Javeriana, Bogota, Colombia.

LatIPnet Inc., a NASA Research Park partner, is a global nonprofit 501(c)(3) organization with the mission of transforming knowledge into wealth for Latin countries. Through a network of experts in intellectual property, technology transfer and commercialization, high-tech businesses, and regional development strategies, LatIPnet has established alliances with prestigious universities and research centers around the world, as well as with global high-tech companies that offer invaluable resources to support the process of transforming knowledge and technological resources into economic and social value.

SAVDS cont'd from page 14

the UAV; (2) evaluating and prioritizing collision potential; (3) featuring safe separation and collision avoidance algorithms that generate audible and visual alerts for Closest Points of Approach; and (4) recommending changes in the UAV flight plan to maintain safe separation distances and enable deconfliction from other aircraft. SAVDS® also has extensive data analysis tools and the capability of interfacing with varied data feeds (e.g., ADSB as well as FAA radar) for comparative analysis. The UAV-centric perspective of SAVDS® represents a level of safety for UAV pilots that is equivalent to or better than the see-and-avoid capability of cockpit-based pilots in manned aircraft.

SAVDS® features three different Display Modes that provide the most effective view of UAV-centric air traffic activity as a function of potential midair conflicts. These three Display Modes are referred to as: (1) Safe Separation; (2) Conflict Avoidance; and (3) Immediate Collision Threat. When there is no detectable airborne conflict, it is the Safe Separation Display Mode that shows the all-encompassing airspace view needed by the UAV pilot, providing reassurance that there is no need to change the UAV flight plan. When there is a detectable airborne conflict, SAVDS® provides the UAV pilot with the other Display Modes as a means of focusing on the conflict(s) of concern and enabling the most effective means of increasing the separation distance between the UAV and the intruding aircraft.

SAVDS® was designed and developed with the constructive guidance of UAV pilots. SAVDS, Inc. has long recognized that UAV pilots will be processing the information and recommendations provided by the GBSAA System for the purpose of executing changes in UAV flight plans and performing immediate evasive maneuvers. SAVDS® was specifically designed to supersede a visual observer based on its ease of use and the clarity of the information presented. In addition to the real-time information sharing capabilities of SAVDS® during actual UAV flight operations, SAVDS® also stores complete data logs and provides data analysis and playback tools. To assist the FAA in tracking UAV flight operations, all UAV flight and air traffic information will help expedite the regulatory process for UAVs and allow the FAA to have a historical data base from which to base current and future UAS regulatory guidance. The FAA considers accurate recordkeeping to be essential in assuring positive operational and quality airworthiness control.

For the NASA MIZOPEX Project in Alaska, sense and avoid was accomplished using the Sentinel-SAVDS radar-display system to monitor air traffic in and around the pre-defined transit corridor. The SAVDS display operator had direct communication with the UAV pilot at all times. Sentinel-SAVDS was used to effectively clear the airspace in and around the transit corridor, enabling the UAVs to make safe outbound and inbound transits.

Software Management Celebrates 10 Years of Successful Innovation in Silicon Valley

CMU-SV
June 25, 2014

This year Carnegie Mellon University's Master of Science in Software Management (SM) degree program marked its 10th anniversary. The interdisciplinary program, offered at the Silicon Valley campus, was recently incorporated into the university's new Integrated Innovation Institute. To commemorate both events, alumni and friends of the program met on Sunday, June 22, at Tesla Corporate Headquarters in Palo Alto, Calif. for a celebration and class reunion.

Excitement was high as 150 alumni and guests gathered for the event, which included Deepak Ahuja, CFO of Tesla and a CMU alumnus, as the keynote speaker, presentations from the co-directors of the Integrated Innovation Institute and other visitors from the main CMU campus in Pittsburgh. In addition, four very accomplished software management alumni formed a panel to discuss innovation in the entrepreneurial environment: Frank Gutierrez (MS '10), Vice President of Business Applications at Genesys; Ana Pinczuk (MS '10), leader of the Global Enterprise Theater (GET) Services Sales group at Cisco Systems; Alok Rishi (MS '09), CTO/Co-founder at Khylo, Inc.; and Merline Saintil (MS '05), head of global operations for Mobile & Emerging Products at Yahoo!

The software management program launched in 2003 as the MSIT in Management of Software Systems Development, a part-time program designed for mid-career software professionals working on large-scale systems development. The current master's degree curriculum and name were adopted in 2007, and the program has evolved to emphasize software and product development as practiced by the high-tech companies of Silicon Valley. A full-time program was added in 2011 with a specific focus on innovation and entrepreneurship. Including the Class of 2014, the program now has more than 300 graduates, among them software engineers, product managers and successful entrepreneurs. Many continue to work in the Bay Area, providing an invaluable professional network for fellow Silicon Valley campus and Bay Area alumni.

Photo by Sonic Images Group, Inc.

Keynote speaker and CMU alumnus Deepak Ahuja of Tesla Motors.

Collaborative success and elite innovators

Jonathan Cagan, George Tallman and Florence Barrett Ladd Professor in Engineering in CMU's Department of Mechanical Engineering, and co-founder / co-director of the Integrated Innovation Institute, acted as emcee and opened the event by describing the collaborative nature of the newly formed institute — a partnership between the College of Engineering, the Tepper School of Business, and the School of Design, part of the College of Fine Arts. According to Cagan, "the role of the Integrated Innovation Institute is to train elite innovators through the holistic contributions of these different fields. A culmination of these disciplines is necessary to develop a successful product or service today." Cagan added his enthusiasm to the inclusion of the software management program as part of the institute. "The SM program is a real gem and brings the software perspective to the design and business components that were already being explored in product development creations."

Also joining in the celebration was James Garrett, Dean of the College of Engineering. "It was an easy decision to include the software management program in the Integrated Innovation Institute," he said. "As dean, my vision is to develop greater interactions and greater integration between the Silicon Valley and Pittsburgh and to strive to have all of the programs offered affiliated strongly with an activity at Pittsburgh's main campus."

Keynote speaker Ahuja earned his MBA at CMU's Tepper School of Business and worked at Ford before joining Tesla. In his insightful speech, he said "The spirit of innovation is such a powerful force. To really be revolutionary in your innovation or your thought process, you need that incredible vision which is driving, which is passionate, to bring an awesome team of people around you to make something new happen."

Alumni in software leadership

Cagan posed several questions for the alumni panelists, engaging their technical acumen and leadership experience to focus on key questions facing Silicon Valley and the international software industry.

What's the biggest challenge you face as a leader in the technical field? Cisco's Pinczuk said, "The biggest challenge is recognizing what you have to do to change as a leader, recognizing talent and what you need for the company going forward."

CMU Software cont'd on page 22

NRP Partner Planners Collaborative Wins Two Top Telly Awards for Producing NASA Videos

Moffett Field, Calif.
July 17, 2014

The Telly Awards has awarded Boston-based consulting firm The Collaborative two Silver Awards –the highest honor awarded—in the 35th Annual Telly Awards for their pieces titled 'Bringing Life into Space' and 'Studying Life in Space.' With nearly 13,000 entries from around the world, Silver Tellys go to a select number of respected advertising agencies, production companies, and corporate video departments.

Produced for NASA's Ames Research Center in Moffett Field, California, under contract with Lockheed Martin, the six-minute 'Bringing Life into Space' video shows how NASA researchers conduct cutting-edge biological science to enable future long-term deep-space missions—such as exploring an asteroid and Mars–and to improve life on Earth. The three-minute animation 'Studying Life in Space' uses stop-motion graphics to depict the process of how a scientist might get his or her experiment funded, readied, and sent into space with the help of NASA.

To view these videos, visit:
http://www.nasa.gov/ames/research/space-biosciences.

The Telly Awards was founded in 1979 and is the premier award honoring outstanding local, regional, and cable TV commercials and programs, the finest video and film productions, and online commercials, video and films.

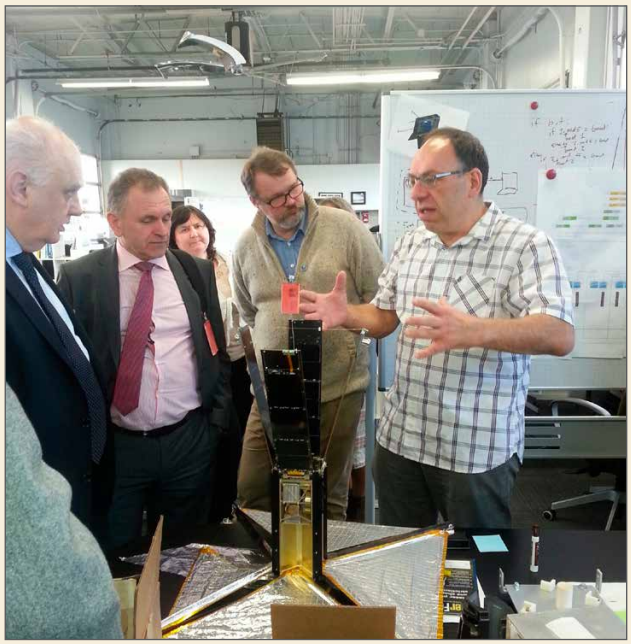
"The Telly Awards has a mission to honor the very best in film and video," said Linda Day, Executive Director of the Telly Awards. "The Collaborative accomplishment illustrates their creativity, skill, and serves as a testament to great film and video production."

"Most people think of NASA as exploring space," said Collaborative CEO Joe Brevard, "But these videos show how much exploration takes place in the laboratory."

The Collaborative is an award-winning consulting firm with a national reputation for excellence in planning, design, and communications. It began in 1990 as an outgrowth of Wallace Floyd Associates, a firm founded with Buckminster Fuller to design and build such signature projects as Epcot Center and the United States Pavilion at Expo 67. Today the firm works on projects that build strong communities and organizations, shape extraordinary places and designs, and inspire new ways of thinking and action. The firm's Communications Group has won five Emmy Awards for educational programming, and numerous Telly Awards.

Polish Delegation Visit

Photo by Courtney Lopez/NRP



Polish Science Ministry Delegation received a briefing on the NRP by NRP Director Michael Marlaire and toured NRP Partner Canopus Systems facilities with Canopus President Tomas Svitek and COO Megan Nunes.

Photo by Courtney Lopez/NRP

Photo by Courtney Lopez/NRP

CMU Software cont'd from page 20

Photo by Sonic Images Group, Inc.

What's the best way to prepare our workforce to be successful in a multidisciplinary future? Rishi said he was "excited about people bringing in wildly different ideas from different disciplines through the transition of the software management program into the new integrated innovation institute." Saintil added, "We want people to be curious; this allows you to change how you're seeing the world and be innovative." Gutierrez noted that "it is important to refuel the intellectual tank; interacting with the (Silicon Valley) community to get a better level of intellect."

What excites you about the future of the software industry? For Rishi, it's new opportunities — "everything has a programmable interface. Anyone passionate about software can find their niche." Gutierrez added, "There is a concern that we are seeing a big digital divide; those who have the ability to have knowledge and those who do not. Technology is a huge equalizer and assists with diversity. But we really need to ensure that as we are able to participate in this, we also bring other folks into that mix."

Cagan's follow-up question: What worries you about the future of the software industry? Pinczuk's answer, echoed by other panelists, was "Security! How do we safeguard the information and data that is relevant to us? This is a big software opportunity for those of us in the room." Saintil elaborated, saying "Privacy is a big concern for me as a leader. Do our clients feels that we are being transparent with regards to what information is being collected?"

The final question: What were the most useful skills, lessons and knowledge in the software management program? Rishi summarized the experience well, explaining "The complexity is not technology. The people are the most random part of the equation. Managing people, dealing with people's emotions, bringing together people of different diversities and cultures, mental attitudes, personalities, especially in a start-up environment where there are pressures that are unnatural, it makes it a volatile situation. Learning how to be an effective team and address the issue of people is the most valuable lesson and skill gained from the software management program."

Gladys Mercier, director of the Software Management program, concluded the event thanking everyone who joined in the celebration and who has supported the program during the last decade. "We would not be here today if it were not for all of you! Our program will continue to grow and get stronger because of our accomplished alumni and all of our supporters, both here in the Silicon Valley and in Pittsburgh."

Connect Bogota Delegation

Photo by Courtney Lopez/NRP

The Connect Bogota Delegation from Colombia was briefed by NRP Director Michael Marlaire on March 28, 2014.

Tokyo Shiodome Building Installs Bloom Energy Server

Bloom Energy Press Release
June 17, 2014

The SoftBank Group and Bloom Energy Japan Limited today announced the installation of the "Bloom Energy Server," an innovative and clean electricity generation system, at Tokyo Shiodome Building on June 17 in Minato Ku, Tokyo Prefecture. The Bloom Energy Server installed at Tokyo Shiodome Building, home to SoftBank Group headquarters, can produce 200 kilowatts of power and provides 14% of the buildings' overall electricity needs.

The Bloom Energy Server is a breakthrough solid oxide fuel cell technology that generates clean electricity from multiple fuel sources such as city gas and biogas at over 60% efficiency*. Bloom Energy Servers have been installed in many locations that require uninterrupted power supply such as data centers, manufacturing operations, communications, and facilities with high energy loads including refrigeration and critical services in the U.S.A.

To contribute to disaster preparedness in Tokyo, Bloom Energy Japan can supply electricity generated by Bloom Energy Servers to streetlights and free power outlets in emergencies. Furthermore, to contribute to the clean energy urban development of Tokyo, Bloom Energy Japan is also supplying electricity for EV stands installed on the underground parking floor of Tokyo Shiodome Building.

"I am delighted that we have installed the Bloom Energy Server at Tokyo Shiodome Building. I believe that this installation at our SoftBank Group headquarters greatly enhances our business continuity capabilities in the event of an emergency. We will continue to promote this innovative, reliable, and safe on-site electric generation method as a clean energy solution for future generations." said Masayoshi Son, SoftBank Group Representative, and main tenant of the Tokyo Shiodome Building.

Dr. KR Sridhar, Principal Co-Founder and CEO of Bloom Energy, commented, "Bloom Energy is pioneering a new energy vision and SoftBank is at the forefront of this transformation in Japan. By installing the first system in Tokyo, SoftBank is setting an example for other businesses to take control of their energy and contribute to clean and reliable energy future for Japan."

"Bloom Energy Japan brings a proven on-site electricity generation product that is ideally suited for places that are prone to large scale natural disasters," commented the honorable General Colin Powell, the former United States Secretary of State and a member of Bloom Energy's Board of Directors. "The product offers resiliency, cost predictability for the future and sustainability benefits. I hope that the Japanese Government and Commercial sector take a serious look at the unit we are unveiling today and consider using the product for their own energy needs."

Photo source: Bloom Energy

SoftBank CEO Masayoshi Son, KR Sridhar, General Colin Powell, Ambassador Caroline Kennedy and the Bloom Energy Japan team headlined an event at SoftBank's Headquarters in Tokyo featuring the first downtown Tokyo installation of a Bloom Energy Server.

"I would like to express my sincere appreciation to all those who made it possible for us to start operating the first Bloom Energy Server in Tokyo." said Shigeki Miwa, Representative Director and CEO of Bloom Energy Japan. He added, "We will work to empower Japan's adoption of the Bloom Energy Server, highly efficient on-site power generation system for business and industrial field, to contribute to the stable power supply of Japan."

By selling electricity generated by the Bloom Energy Servers, Bloom Energy Japan will contribute to sustainable and stable energy provision and economic development in Japan.
**Initial performance.*

Santa Clara County Unveils Bloom Systems at Earth Day Celebration

Photo source: Bloom Energy

Local officials in Santa Clara County attended a "Switch Flipping" Ceremony at one of the County's facilities. The 2.6 MW Bloom project was financed in partnership with Washington Gas Energy Systems (WGESystems).

NRP Partners Engage Public at 21st Century Medical Technologies Panel

By Kathleen Burton, NASA Research Park

NRP partners, with three different ideas for 21st Century medical models, presented their breakthrough technologies and ideas to the public at the "NRP Partnerships Accelerate Development of 21st Century Medical Technologies to Improve Your Health" Panel, held April 2, 2014 in Bldg. 3. Three models discussed included: using a tricorder-like device to self-diagnose, using a vascular compression concept, and harnessing the latest neurological research to alleviate pain and other disorders.

The panel kicked off with Dr. Alan Greene, CMO Scanadu, Inc.. Greene showcased Scanadu "Scout," a hand-held medical 'Tricorder' whichs take vital signs in seconds. (Greene spoke first because he was jetting off to Manhattan to tape a show about Scanadu with Dr. Oz). "The world is a different place in 2014," said Greene. "Now we need to understand our own health better before always seeing the doctor."

Scout is used with a Smart Phone to track vital signs in approximately 10 seconds at home. At a price point of less than $200, it will give a "health snapshot" of heart and respiration rates, oxygen levels and blood pressure. "Scanadu is betting on empathy," Greene noted. "Our model is to encourage inexpensive individual self-exams to monitor our own health, as a pre-cursor to visiting the doctor. Eventually, Scout will add features to monitor urine, saliva, hormones, blood and viral load," he said. Part of an FDA study, Scout was crowd-funded in 2013 via Indigogo, receiving about $1.6 million for the prototype launch and test earlier this year.

Next up was Dr. Philip Low, Founder and Chairman and CEO NeuroVigil Inc. -- The company is working on a platform of devices, machine algorithms and databases to better understand brain pathologies. iBrain technology, a neurotechnology platform to scan the brain remotely as well as to empower individuals with neurological diseases and disorders. "The brain is one of the final frontiers," Low said, "and we are working to hear the brain's whispers by studying what happens in the brain during sleep." Using non-invasive devices that measure brain activity, NeuroVigil now can do brain scans to assess drug reactions at home and give more data about brain/nervous disorders (including Alzheimer's), which are estimated to affect as many as 1 billion people worldwide. "This lets us send data directly to Big Pharma, bypassing V.C.'s", he said.

In addition, the devices can assess biomarkers in the brain, and the company's proprietary IBrain technology is now in clinical trials allowing mind-enabled communication with ALS patients to move or communicate. One high-profile patient being studied is astrophysicist Dr. Stephen Hawking. Another area of research NeuroVigil is pursuing is sleep studies which can indicate different underlying conditions, including PTSD, sleep apnea and depression.

Per Elon Musk, CEO and Chairman of SpaceX: With its business model, Neurovigil has "a true potential to completely revolutionize neuroscience."

Photo source: NASA

The last speaker was Mr. Peter Wasowski, Founder + CEO Vasper Systems California, LLC. Vasper's "out of the box" technology provides users with rapid, enhanced exercise benefits. Wasowski's product is based on vascular compression with the health benefits based on 3 core principles — bio-mimicking a young child's chemistry, causing high lactic acid build-up in short muscles, and creating a so-called anaerobic scenario in which oxygen levels in the blood are depleted. This "tricks the brain" into kick-starting pituitary gland and other chemical processes, which can heal a variety of disorders.

Another use is for extended space travel in ZeroG, in situations like the ISS, reducing need to exercise from 2.5 hours to about 20 minutes with the same efficiency for cardio vascular and other body processes (Vasper has a Space Act Agreement with NASA to study the potential use in space). Patient groups Vasper has worked with include Veterans (including injured Veterans), elderly people, people with neurological problems, and improving fitness levels for U.S. Navy Seals.

After the talks, panelists Lowe and Wasowski answered questions during a lively Q&A. During this session, Wasowski said that Vasper was used on Physical Therapy patients at UCSF, which was discussed in a recent TED talk. Dr. Lowe noted his technology can be used with the elderly, to assuage pain (including in fibromyalgia cases) and in OCD cases and Parkinson's disease. He noted that patients can carry the gene for Parkinson's but do not express the gene. The Panel Moderator was Dr. Jeffrey Smith, Ames Space Biology Project Manager, Space Biosciences Division.

For past NRP Exploration Lecture Series events and to view the Medical Technologies Panel flyer, please visit: www.nasa.gov/researchpark

NRP Post

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