

From Star Trek to SCOUT: The Story of a Real-World Medical Tricorder

by Dr. Aaron Rowe, Research Director and
Yvonne Cagle, M.D. Col, USAF, Ret. Senior Flight Surgeon



The Scanadu SCOUT reads information such as heart rate, blood oxygenation, electrical heart activity, pulse, and temperature.

The 1960s TV series Star Trek was as popular for its plots as for its imaginary, futuristic technologies. One of those 23rd century technologies, the tricorder, is becoming a 21st century reality. And it's being developed—appropriately enough, given its sci-fi space origins—at NASA Ames Research Center in Mountain View, Calif.

Scanadu Inc., founded in January 2011, has developed the Scanadu SCOUT, a medical tricorder inspired by the gadget the fictional Dr. Leonard McCoy on Star Trek used to collect data about crew members' health. The SCOUT device has the potential to revolutionize medicine, both here and in space, for which it and Scanadu have been earning a lot of attention recently. The Scanadu SCOUT won the 2013 CES Best of Innovations prize for Personal Electronics. Scanadu has also been featured in Forbes' 2013: The Year of Digital Health; was named Fast Company's no. 2 on its list of Top 13 Health Stories of 2012; was among VentureBeat's top 10 "med tech" stories of 2012; and was named the Wireless Health's 2012 Company of the Year.

Scanadu's medical tricorder SCOUT is a small handheld device for consumers to use in conjunction with a smartphone. Once the user places the SCOUT against his temple for 10 seconds, the device provides information on pulse transit time, heart rate, heart rate variability, electrical heart activity, temperature,

Tricorder cont'd on page 8

Singularity Hub Acquired! Now Part Of Singularity University

by Keith Kleiner, Founder and Editor of Singularity Hub
As printed at SingularityHub.com on November 14, 2012

I am extremely pleased to announce today that Singularity Hub has been acquired by Singularity University. Singularity Hub's mission has always been to offer readers the best news coverage of sci/tech breakthroughs that are rapidly changing human abilities, health, and society. Now, as part of Singularity University, Singularity Hub will be able to fulfill this mission better than ever.

Singularity University has grown over the last four years into the epicenter of the singularity community. You may have noticed that an incredible number of speakers, faculty, CEOs, and game changers of the world are visiting and contributing to Singularity University on a regular basis. Now that Singularity Hub has been acquired by Singularity University, we will have direct access to this impressive and growing network of people, ideas, and content. The benefits to Singularity Hub are, in fact, already kicking in: Singularity Hub members now have access to dozens of outstanding lectures and presentations from the Singularity University archive within our Video Central page. Peter Diamandis, Ray Kurzweil, Peter Norvig, and Kevin Kelly are just a few of the interesting individuals that are featured.

For long-time readers of the Hub and new readers alike, please be assured that post-acquisition Singularity Hub will maintain its independence and commitment

Singularity cont'd on page 16



Singularity University CEO Rob Nail talks about innovations in education technology with Gavin Newsom, Lieutenant Governor of California and host of "The Gavin Newsom Show."

CONTENTS

Singularity Hub Acquired! Now Part Of Singularity University	1
Personal Health Tricorders Made at NASA Ames	1
New Partners	2
NASA Research Park Post Editor's Farewell	2
Peter Diamandis Inspires Crowd at December 2012 NRP Lecture	3
Carnegie Mellon University Silicon Valley Holds 3rd Annual DMI Workshop	5
Entrepreneurship Program at CMUSV Opens with Idea Workshop	5
CMUSV and NASA Researchers Map Underground Faults Using UAS	6
Wyle Employees Receive 2012 Agency Honor Award from NASA	9
Verdigris Technology Plans Smart Grid Shakeup with Building.AI	10
AAC Microtec-Supported 1U CubeSat Successfully Launched from ISS in October	11
Mars Institute: We are Go for Mars	12
RMV Developments	14
IntraPoint Continues to Establish itself as the Global Leader in Enterprise Resiliency	15
ARCTek 3	15

Please welcome Carol Le as the editor of the NRP Post. This will be her 2nd issue as editor.

NRP Welcomes



Stellar Exploration

Bldg. 19, Room 2077
Commencement: 10/1/12

Stellar Exploration is small aerospace product-oriented company addressing selected NASA and DOD markets. They respond best to challenges that can be addressed by small multi-disciplinary teams. Customers are supported by synergy between rigorous systems engineering and hands-on engineering skills. Stellar's team of energetic engineers, hand picked from Cal Poly, is guided and balanced by years of experience from senior engineering and management staff. They specialize in asking the right questions to translate customer needs into product requirements. Stellar's past accomplishments span a broad scope of projects, which bolsters their belief in multi-disciplinary teamwork.

Astrotecture

Bldg. 19, Room 2074
Commencement: 12/01/12

Astrotecture's objective is to become the premier global provider of Space Architecture design services. Space Architecture encompasses the design of space living and working environments; spacecraft, lunar and planetary base configurations; plus the human system integration to make it all function. Astrotecture offers architectural services for the design of spacecraft, space habitats, lunar and planetary bases, interplanetary and interstellar vehicles, and terrestrial architecture, including residential, research and development recreational, and institutional facilities.

Game Changers, LLC

Bldg. 19, Room 2001
Commencement: 11/16/12

Game Changers, LLC is a technology development firm that is actively seeking to advance the readiness and marketability of breakthrough technologies. Project NMSET is the flagship project of Game Changers, LLC as it is poised to revolutionize the aviation industry through innovations in lift and thrust.

NASA Research Park Post Editor's Farewell

Farrar Assigned as NRP Lead to the Space Portal Planetary Sustainability Initiative

Diane Farrar designed NASA Research Park's original marketing products and produced NRP's initial Open House in 2005. In 2006 she designed and published the first NRP Post. She acted as Editor of the NRP Post from 2006 until June 2012, while serving as an NRP account manager.

Informed by NASA's earth science climate studies and Native American colleagues while on a fellowship, Farrar came to NASA Research Park in 2003 believing development by the federal government should incorporate sustainable design principles. She brought internationally acclaimed green architect William McDonough to address Ames, and she launched an early proposal to re-surface portions of Hangar 1 with building integrated photovoltaics.

Farrar is happiest that her idea to invite the International Space University to NRP was embraced by Center Director Pete Worden. "It has been a great privilege to work with our innovative academic and industry partners as Editor. Your determination to bring transformational knowledge and products to market is inspiring. I will miss seeing the future through your eyes."

Prior to NRP, Farrar worked in the Ames Public Affairs Office where she received numerous awards, including eight Group Achievement awards, seven Special Act or Service Awards, and in 2005 the Ames Sustainability Award (at NRP).

Peter Diamandis Inspires Crowd At December 2012 NRP Lecture

by Kathleen Burton, NASA Research Park

Best-selling author, space entrepreneur, medical doctor and educational visionary Dr. Peter Diamandis gave an upbeat lecture to an overflow crowd at Bldg. 3 on December 3.

Delivering the 15th Lecture in the NRP Exploration Lecture Series, titled “Abundance”, Diamandis credited his early exposure to NASA as the driving force for his later successful ventures in the entrepreneurial space arena.

“It was my initial passion for NASA and space that has driven many things that I’ve done,” Diamandis said, opening his talk.

A self-proclaimed ‘space nut’, Diamandis won first place in the Estes rocket design contest when he was an 8th grader, and longed to become a NASA Astronaut during the Apollo years. “I knew then that NASA makes dreams come true,” he said.

But Diamandis quickly realized that becoming a NASA Astronaut was unreachable, due to the intense competition. “It was not to be,” Diamandis said, “but other doors opened up.”

A key turning point in Diamandis’ evolution was reading “the Spirit of St. Louis”, a book by Charles Lindbergh about his bold attempt for the then-astronomical \$25,000 prize offered in 1927 by Raymond Orteig to the first aviator to fly non-stop across the Atlantic from the New York to Paris. Lindbergh and his team meticulously designed the “Spirit” with aircraft manufacturer Constellation, then battled sleep, flew solo and won, becoming the golden boy of the 20’s. This milestone galvanized the world and drove the nascent field of aviation into overdrive. “This incentive of a monetary prize changed the market. People did not believe achieving Lindbergh’s goal was possible, and then, because of this prize, suddenly, it was,” Diamandis said.

Reading about Lindbergh gave Diamandis the idea of offering a monetary prize for the first private sub-orbital space flight. In the late 90’s, he launched the Ansari X Prize as CEO and Chairman of



Image by NASA/Dominic Hart

Dr. Peter Diamandis engages the audience during the “Abundance” lecture, part of NRP’s Exploration Lecture series on December 3, 2012.

the X Prize Foundation, offering a \$10 million prize to the winner. Twenty-six teams competed and in 2004, Burt Rutan’s Tier One Project won. “This kicked off an industry of personal sub-orbital space flight and opened the space frontier for humanity,” he said. The Diamandis legend was born.

Now, led by Diamandis, the X Prize Foundation designs and operates large-scale global competitions in a variety of areas, to solve what he calls “global market failures”. X Prizes are now offered to develop a medical tricorder for human health, a lunar lander, a better way to rapidly clean up oil spills and a technique for asteroid mining. Other X Prizes are in the works for a rapidly scalable global literacy model, a way to better predict earthquakes and for organogenesis, a process by which the ectoderm, endoderm and mesoderm of an organism can be deployed to develop the internal organs of the organism.

“The best way to predict the future is to create it yourself,” said Diamandis.

One perception that he shared with the audience is that global connectivity and ‘disruptive’ technologies are blasting through standard business models, creating new realities. “Small teams and businesses are now, due to new technologies, able to accomplish what huge corporations and governments once did,” he said. Diamandis noted Kodak as an example of the old way, a now-bankrupt giant that invented, yet could not harness, the digital camera.

In contrast, today’s shape-shifting world is powered by fleet-footed upstarts like Instagram, the iPhone photo-enhancer with 13 employees who was recently purchased by Facebook for \$715 million.

“In today’s new world, now either you disrupt or you are disrupted,” he said.

Among Diamandis’ many accomplishments, he is the New York Times Bestselling author of the book “Abundance—The Future Is Better Than You Think.” Abundance was recently #1 on Amazon and #2 on New York Times best seller lists.

Lecture cont’d on page 4

NRP Post

Lecture cont'd from page 3

Two ideas from Abundance that Diamandis shared with the audience were “crowd sourcing” and “10⁹ thinking”.

“Thanks to crowd funding, there’s a chance for the crowd to fund hunches, and try a lot of new directions,” he said. “I’m really excited about the ability of individuals and small teams to do bold things in science, ideas that might seem crazy at first until they are proved to be remarkable. Remember—the day before something is a breakthrough, it’s a crazy idea,” he said.

His concept of “10⁹ thinking” is that today’s hot ideas need to be “global and exponential, not local and linear.” Creating a world of possibility is only limited by the hardware and software of our brains, Diamandis noted.

This has created “a world of abundance”, where anything is possible and intractable global problems of “a billion people” can be solved.

Diamandis’ rules for blasting forward and not getting stuck in “incremental changes” include: “Celebrate risk”, and “Set the bar high above the line of Super-Credibility.”

The Lecture was MC’d by Dr. Bob Richards, CEO and co-founder of Moon Express, an NRP tenant. Richards oversaw a thought-provoking Q&A with Diamandis after the talk.

One questioner asked about harnessing technology to solve global climate change. Diamandis responded that climate change will likely be solved by a yet-unknown disruptive technology. Citing a pre-technology “transportation” problem of the 19th Century (disease-causing piles of horse manure in cities), the problem was solved by the motor car, then a new technology, he said.

Diamandis closed with a reflective answer to a questioner about his biggest wish for his twin toddler sons.

“My biggest wish for them is that they find their passion the same way I have,” he said.

Diamandis is the Co-Founder and Executive Chairman of Singularity University, a graduate-level Silicon Valley institution that studies exponentially growing technologies, and their ability to transform industries and solve humanity’s grand challenges.

In the field of commercial space, Diamandis is Co-Founder/Co-Chairman of Planetary Resources, a company designing spacecraft to enable the detection and mining of asteroid for precious materials. He is also Co-Founder and Vice Chairman of Space Adventures, the only company to have brokered the launches of private citizens to the International Space Station, and co-Founder, past-CEO of Zero Gravity Corporation providing weightless parabolic flights.

He earned an undergraduate degree in Molecular Genetics and a graduate degree in Aerospace Engineering from the Massachusetts Institute of Technology, and received his M.D. from Harvard Medical School.

Image by NASA/Dominic Hart



Dr. Peter Diamandis (left) with Center Deputy Director Lewis Braxton III (right)

In addition, Diamandis has won multiple awards, including the first Heinlein Laureate, the 2010 Economist “No Boundaries” Innovator of the Year Award, the 2007 Arthur C. Clarke Award, the 2006 Lindbergh Award, the 2006 Neil Armstrong Award. ◆



Their hard work paying off, sixty-three students from Carnegie Mellon Silicon Valley, representing the Master of Science in Software Engineering, Master of Science in Software Management, and Master of Science in Information Technology, received their diplomas on Sunday, August 12. The class of 2012 represents the tenth anniversary class of students graduating from the Silicon Valley campus, established in 2002 at Moffett Field in Mountain View, CA, in the heart of Silicon Valley. This year’s ceremony welcomed the Mayor of Mountain View, Michael Kasperzak and keynote speaker, Edward H. Frank, who is a Vice President of Apple, Inc. and a co-founder of the Silicon Valley campus.

Carnegie Mellon Silicon Valley Holds Third Annual Disaster Management Initiative Workshop

by Jessie Hao, Marketing Coordinator at CMUSV



CMUSV Director Martin Griss and NASA Ames Protective Services Chief Phil Snyder at the 2012 DMI Workshop.

Though Silicon Valley possesses the technology and resources to prepare for future disasters, community resilience and interoperability measures across sectors remains a challenge to effective disaster management. The recent devastation of Hurricane Sandy has shown that traditional telecommunications

infrastructure is highly vulnerable, causing difficulties in communication between neighbors and emergency personnel.

Carnegie Mellon Silicon Valley's Third Annual Disaster Management Workshop, "Making Smart Communities Resilient," spanned over the course of two days and brought together industry leaders and community first responders to test technologies and ideas that could improve disaster management before, during and after emergencies especially as it pertains to data communication. "The key idea of our workshop this year was to focus on interoperability actions and low cost, open source technologies to simplify communications among citizens, first responders and emergency vehicles," said Martin Griss, Director of the Disaster Management Initiative.

CMUSV Distinguished Research Fellow, Dr. Steven Ray, led an Emergency Vehicle Plugfest to collect data on measures of interoperability among mobile command and communication vehicles using primarily WiFi clouds. Emergency vehicles from Palo Alto, Mountain View, Sunnyvale, Monterey County and Cisco

participated in the event. Building on last year's event by taking a more structured approach to testing, Dr. Ray said, "Our goal is to get a much clearer picture of what each vehicle's capabilities are in regards to data sharing."

The Palo Alto Mobile Emergency Operations Center (MEOC) has also been collaborating with Carnegie Mellon University in the Survivable Social Networks (SSN) project, part of the Silicon Valley Resilient Network (SVRN). Dr. Bob Iannucci, Director of the CyLab Mobility Research Center and his team of graduate students led a Community/Agency Interoperability event to demonstrate the potential of SSN to provide an alternative avenue of communication when Internet and cell towers are down. Rather than relying on large telecommunications infrastructure, SSN provides a standalone WiFi "bubble" for emergency neighborhood communication, providing some web, social media and voice service.

"There is great power in this social networking concept when it is combined with inexpensive, scalable and resilient infrastructure. We've created SSN such

DMI cont'd on page 6

Entrepreneurship Program at CMUSV Opens with Idea Workshop

by Jessie Hao, Marketing Coordinator at CMUSV

Kicking off its second year, the Software Management 12-month intensive Entrepreneurship program opened with a week-long faculty-led Idea Workshop as part of Orientation activities. This year's class wasted no time diving into the entrepreneurial boot camp, which aims to introduce students to a real world understanding of how a product is brought to market in Silicon Valley.

The Valley works at a breakneck speed—constant change means adaptation is crucial to success. Entrepreneurially minded students arrive on campus from all over the world with goals of becoming founders, software managers, innovators, and disruptors, and the need for entrepreneurial experiences within this hotbed of activity. "The Idea Workshop gives students an accelerated on-ramp experience to generate, evaluate and select ideas to pursue in the program. Daily, they practice techniques to brainstorm original ideas, critique existing ideas, and learn to identify affinities so that the resulting combined proposals have a higher



Software Management Consulting Professor Sheryl Root teaches key entrepreneurial skills in the 2012 Idea Workshop.

Entrepreneurship cont'd on page 7

NRP Post

Carnegie Mellon Silicon Valley and NASA Researchers Map Underground Faults Using Unmanned Aerial System

by Jessie Hao, Marketing Coordinator at CMUSV

Carnegie Mellon Silicon Valley and NASA Ames research scientists recently returned from a successful deployment to map the underground geophysics of Surprise Valley, CA. In an expedition led by the United States Geological Survey (USGS), a team of scientists and engineers collected magnetic data using a UAS (Unmanned Aerial System) in a region for which geophysical data of the characteristics of the subsurface could prove crucial for earthquake monitoring.

Ritchie Lee, robotics researcher, and Corey Ippolito, Electrical and Computer Engineering PH.D. student and research scientist in the Adaptive Controls and Evolvable Systems (ACES) Group in the Intelligent Systems Division at NASA Ames Research Center, developed the scientific instrumentation, or payload, for the UAS. The mission proved successful with SIERRA (Sensor Integrated Environmental Remote Research Aircraft) collecting baseline magnetic data that will be integrated into the payload for next year's follow-up deployment with a new experimental UAS. "We're very pleased with the high-quality data we've collected. The challenge now is taking the data and doing something with it," said Lee. "We want to apply a three-level process to the data: see, think, and act. We need to take the data and process it to see what we're really looking at, then think about how to plan future routes for the UAS based on what we see and finally, take action with the deployment of the new UAS in a year," explained Ippolito.



Scientists and researchers from Carnegie Mellon University, NASA Ames, US Geological Survey and Central Washington University map underground faults in Surprise Valley, CA.

The team hopes to expand the deployment of UAS to other areas where data on what is below the surface is integral to scientists' abilities to predict the likelihood of earthquakes and the damage they may do. The development of UAS platforms is moving toward increased automation, which would greatly impact the earth sciences, space sciences, and disaster situations. "Right now, we can't send a UAS into a tornado, for example, because it'd probably fly right into it and get destroyed. So, the ability for robotics systems to go into their environments and autonomously apply science to do something useful in response to environments is a huge step into the capabilities of how we operate," said Ippolito.

The Surprise Valley deployment is the result of NASA and CMUSV's extended collaboration with USGS. Lee and Ippolito, in conjunction with the Carnegie Mellon Innovations Laboratory (CMIL) became attached to this project after working on concepts for the intelligent control of vehicles based on magnetic payloads. CMIL seeks to improve forward-looking mobility and aerospace technologies, a vision that is aligned with the development of SIERRA into a more intelligent system for future expeditions. "We're trying to make robots smarter so that we don't need a human controlling them, especially in dangerous scenarios," said Jason Lohn, Associate Research Professor and Director of CMIL. ♦

DMI cont'd from page 5

that it requires no installation and no training. Our hope is that this will become a tool that can be self-deployed at the neighborhood level, affording community members critical resources during a disaster and the ability to be resources to each other," said Dr. Iannucci.

Bruce Mueller, Director of Next Generation Broadband Wireless Research for Motorola Solutions also pointed to the importance of community interaction during emergencies as shown recently on the East Coast. "The response from neigh-

bors to neighbors before, during and after Hurricane Sandy is a sign of hope. It shows that people haven't given up on community, but that it plays a critical role in communication during disasters," said Mueller.

The Mayor of Mountain View, Michael Kasperzak, who participated in the SSN demo by announcing a simulated "fire" emergency, acknowledged the significance of the data collected in both the Plugfest and SSN demos. "We are thinking about how to incorporate these tech-

nologies into the community." Lynn Brown, Office of Emergency Services Coordinator of Mountain View Fire Department also said that SSN is an exciting development that Mountain View Community Emergency Response Teams (CERT) should consider.

Several invited speakers emphasized the importance of collaboration across public and private sectors on the issue of preparedness. Barbara Larkin, CEO of the American Red Cross Silicon Valley chapter reported that though

DMI cont'd on page 7

Carnegie Mellon University, Silicon Valley Ranked #1 Satellite Campus

by TheBestColleges.org

Photo courtesy of huffingtonpost.com



For a school that wants to grow its reputation of being a technology education leader, where better to set up shop than right in the heart of Silicon Valley. Over 2,600 miles from Pittsburgh, this CMU campus in Mountain View, California is surrounded by names like Google, Microsoft, and Yahoo. The campus has made a name for itself in several areas, least surprisingly in tech research like that done in the Mobility Research Center and in helping foster over a dozen startups in 10 years. But the branch is also a noted social good practitioner, launching the Disaster Management Initiative to support new solutions for crisis management, and developing a tradition of fence painting to raise money and awareness for worthy causes.

Entrepreneurship cont'd from page 5

potential for success. Teams self-form around the most promising ideas and according to the individual students interests," explains Gladys Mercier, Director of the Software Management program.

The workshop also included visits to startups and brought guest speakers, many of whom are Carnegie Mellon Silicon Valley alumni, to share insights into the startup process. "Having launched a startup myself, I hope to shed light on how an idea turns into an actual business," said Manoj Rajshekar (MS SM '11), who along with fellow CMUSV graduate, Shekar Deo launched their startup, EngageClick this past year. He advised students to commit fully to ideas they believe in even if there is a risk of failure. "You can always rebuild. There is never a loss in what you're trying to do."

Faculty brought their own industry experience into workshop sessions, introducing students to entrepreneurial best practices and key skills in management, metrics, product definition and strategy. Throughout the year, faculty connections allow for numerous guest speakers such as VCs to advise students and further expose them to the Silicon Valley software industry. They also act as mentors, encouraging students to innovate. "Entrepreneurs

are not normal. Most people are content working in big corporations promising regularized rewards. We aren't motivated that way. We want to see something we've created on our own," Sheryl Root, a Software Management professor, told students.

For some students, the Entrepreneurship program will help them innovate within a larger company. Corporate teams, for example, have the opportunity to go through the program and develop products and services for their existing companies. For others, the classes provide valuable experience working in a startup atmosphere, forming the foundation for future career goals. "I now want to work on my own startup. The workshop has left me so inspired to dream big and work on achieving those dreams," said Class of 2013 student, Medha Ghatikesh.

Last year, Carnegie Mellon University Silicon Valley debuted its full-time Master of Science Software Management program with a focus on software innovation and entrepreneurship. Five of the eight students who completed the inaugural program are now in the process of launching their own startups birthed out of ideas developed during the academic year. ♦

DMI cont'd from page 6

77% of Bay Area residents expect a severe disaster in the next two years, only 19% have taken the necessary steps to prepare, and encouraged Carnegie Mellon University and other private sector companies to assist the Red Cross in preparedness efforts. Jim Turner, Private Sector Liaison for the San Francisco Department of Emergency Management (DEM) echoed this sentiment: "Preparedness is everyone's job, not just the job of the Red Cross and the government. The space where technology meets humanity is where we're going to thrive."

In the closing North Counties Alliance panel discussion, Kenneth Dueker, Director of Emergency Services for the City of Palo Alto, Bard Wardle, Chief of Mountain View Fire Department and Scott Vermeer, Chief of Mountain View Police Department presented opportunities for regional efforts to improve interoperability

and emergency management. The 2012 DMI Workshop both solidified and created new opportunities for collaborations among Carnegie Mellon University, community first responders and industry leaders to create practical solutions to real-world problems. "Our partnership with CMUSV is an asset to the Bay Area community. Because of Dr. Griss and his leadership, CMUSV is different from the typical academic environment where concepts are often purely theoretical. There's certainly value to the academic side of things but we're trying to find points of tangency where the needs of our practitioner world meets academia," said Dueker.

Watch a video segment of the 2012 DMI Workshop on local news at ABC7 News: <http://bit.ly/TFqN1S>

Visit the Carnegie Mellon Silicon Valley DMI page for slides, photos and notes from the 2012 workshop: <http://bit.ly/UaakFa> ♦

NRP Post

Tricorder cont'd from page 1

and blood oxygenation. The device is currently awaiting FDA approval and is scheduled to be available later this year for \$150.

Beyond Sci-Fi: The SCOUT's Origins and Goals

Scanadu's tricorder began its trajectory from sci-fi to real-world in 2007, when cognitive science researcher Dr. Peter Jansen began building tricorder-inspired handheld devices. In March 2012, Jansen showed off his open-source tricorder for the first time to the global press. Jansen's Tricorder Mark 2 was built around a 180MHz Atmel AT92RM9200 microcontroller; two 2.8 inch 320 x 240 pixel OLED displays and resistive touchscreens; 32MB of RAM; and a microSD, on which the Linux operating system and data were stored. Jansen's device measured atmospheric temperature and humidity, pressure, magnetic fields, ambient light and colors. His tricorder was a 'Swiss Army knife' with many potential uses—except the ability to detect neutron fields or radiation from supernovas, a la the Star Trek gadget.

Also in 2012, Jansen joined Scanadu, a start-up with the specific mission of building the medical version of his open source tricorder. Walter De Brouwer founded Scanadu in 2011 after a family medical emergency. De Brouwer was previously known for founding Starlab, a leading European research institute with such visionaries as Nicholas Negroponte and Stephen Wolfram on board.

Scanadu aims to revolutionize healthcare by putting sophisticated medical diagnostics tools into consumers' hands. "We want to arm consumers with more information so that when they talk to their doctors, they know exactly what to say," says De Brouwer, Scanadu's CEO and founder. "We see this as a Goldilocks tool to better the patient/doctor relationship. It has the potential to be the biggest innovation in home medicine since the thermometer."

After his hiring, Jansen immediately began work with the Scanadu team on a medical tricorder. The team includes well-known inventors and entrepreneurs such as Aaron Rowe, Ph.D (the hacker behind CheapStat), Dan Sokol (of Homebrew Computer Club fame) and Brandon Woolsey. Other notables at Scanadu include Dr. Alan Greene, author, public speaker and TV personality; ex-NASA British optoelectronics legend Anthony Smart, Ph.D., who heads up Scanadu's science team; and Belgian übernerd Ivo Clarisse who, at age 18, was a key architect of the European Internet's backbone.

Scanadu developed the SCOUT at the NRP in NASA Ames Research Center. The company benefited from advice offered by NASA employees and other companies on site with which it has a close relationship, such as Made in Space.

By working with the 3D printing company, Scanadu has been able to quickly iterate through hardware designs—a key to the development of all Scanadu products.

A Futuristic Device's Future

Today, patients in the healthcare system are like astronauts on a mission, De Brouwer says. Both are in an unfamiliar environment and are forced to use the knowledge they have to the best of their abilities. Their survival depends on how quickly they can assess their situation. The challenge both face is an informational one. But in the future, healthcare will mutate, becoming a more efficient version of itself in which the patient will be discovered as the most underused resource, says De Brouwer.

"The grand theory of diagnosis will welcome new players next to doctors: machines, algorithms, patient advocacy communities and the crowd," De Brouwer explains. "The Cambrian Revolution of medical devices and apps is the straw that will break the camel's back. For centuries, we've been reading our health. Now, we will start writing it—changing it in real time, while mobile. Health was born to be mobile and at our fingertips. We will wear it like glasses, in our smart devices and in our bodies. Instead of us watching our health all the time, it will be watching us."

Future versions of the SCOUT will have an onboard hyperspectral camera and a microfluidic lab-on-a-chip, enabling the device to analyze rashes and infections and process blood and saliva samples. Based on these and other measurements, the SCOUT could then provide a diagnosis and advise its user on which course of action to take. The SCOUT will be able to instantly transfer patient data to a doctor if medical assistance is needed. If the user's condition is treatable at home, the SCOUT's diagnosis could prevent unnecessary trips to the emergency room or doctor's office.

In 2013, Scanadu plans to bring several products to market in addition to the SCOUT, including diagnostic consumer disposables.

Coming Full Circle: Scanadu and NASA

Scanadu's small-footprint, smart medical devices could also prove critical for long-duration NASA missions. For example, Scanadu devices will be able to capture vital signs, images, and conduct surveillance to identify acute respiratory and urinary illness before a crewmember succumbs to or spreads the illness. By imaging skin or wound progression, the devices will be able to anticipate early degradation in crew performance.

In short, the information Scanadu devices collect will enable the triage and early intervention of conditions that would otherwise seriously compromise crewmembers' health and fitness in space. Just like in Star Trek. ♦

Wyle Employees Receive 2012 Agency Honor Award from NASA

by Ty Bachus, Director of Communications, Wyle STE Group

Wyle team members Winnie Humberson, Steven Graham, Marit Jentoft-Nilsen, Mark Malanoski, and Heather Hanson received a Group Achievement Award from NASA during the 2012 Agency Honor Awards ceremony held at NASA Headquarters in Washington, DC. This prestigious NASA certificate is awarded to any combination of Government and/or non-Government individuals for an outstanding group accomplishment that has contributed substantially to NASA's mission.

The group—which also included civil servants and members from NASA's Scientific Visualization Studio—was selected to receive the award for their outstanding efforts in supporting the Science Mission Directorate Presentation Hyperwall and using it to communicate the wonder and impact of NASA scientific endeavors. The hyperwall—a multi-screen video wall capable of displaying high-definition data visualizations and/or images—provides a unified system for NASA to communicate its most stunning scientific accomplishments in a variety of different ways, in a variety of different settings.

A key to its success is that Wyle team members—part of the Earth Observing System Project Science Office's (EOSPSO) outreach support team—proposed that a portable hyperwall system be developed to display NASA content at high-profile venues worldwide. After six months of intense development by others at NASA, the first exhibit featuring the hyperwall appeared at the Group on Earth Observations VII meeting in Beijing, China, in November 2010. With subsequent invitations pouring in, the number of conferences and venues that the hyperwall traveled to steadily increased.

The hyperwall has since become the primary focus at many of NASA's outreach exhibits including those at the American Geophysical Union conference, American Astronomical Society meeting, annual American Meteorological Society meeting, Planet Under Pressure conference, Asia Oceania Geosciences Society conference, and the IEEE International Geoscience and Remote Sensing Symposium. The excitement that the hyperwall generated at the Asia Oceania Geosciences Society conference in Singapore for example, resulted in NASA receiving an invitation to attend the 2013 Japan Geoscience Union meeting in May. The hyperwall has also been adopted by the US Department of State to be the main exhibit tool used to highlight US accomplishments in Earth science at the upcoming United Nations Framework Convention on Climate Change, 18th session of the Conference of the Parties (COP-18), held in Doha, Qatar in November.

With a full schedule of events already lined up for 2013—including trips to Melbourne, Australia for next year's IEEE



NASA's hyperwall at the 2012 IGARSS conference in Munich, Germany.



Task lead, Winnie Humberson, from Wyle accepted the award on behalf of the group.

Geoscience and Remote Sensing Symposium conference and Ministerial Summit, Canada for the next Group on Earth Observations meeting—the hyperwall will continue to deliver new content and raise awareness about NASA Science across the globe.

To learn more about the hyperwall or to download presentation material adopted from hyperwall content, visit: science.nasa.gov/hyperwall. To view pictures of the hyperwall at various conferences worldwide, visit the EOSPSO photo-stream website at www.flickr.com/photos/eospso. ♦

NRP Post

Verdigris Technologies Plans Smart Grid Shake-Up with Groundbreaking Platform, Building.AI

by Amanda Erickson, Marketing & Brand Development at Verdigris Technologies

When Mark Chung, founder of Verdigris Technologies, returned from a three-week vacation to find a \$500 spike in his electric bill, he was dumbfounded. All he had was a bill from PG&E detailing his aggregate usage for the month. A bevy of questions ran through his head: What was the energy hog? And why was it so hard to figure out?

In 2008, when Mark decided to begin his search for answers, the market only offered smart meters, which detailed aggregate building usage at fifteen minute intervals. That information was a step up from monthly data points, but it still did not provide him with the granular, real-time data he craved about every electrical appliance in the building. Mark realized knowledge was power; if he had known exactly what device had been triggering such high energy bills, he could have adjusted the device and his behavior.

Seeing the answer to the nebulous electric bill as an achievable solution with global impact, Mark envisioned a disruptive technology. Mark wanted more, better information, with easy installation, and at a reasonable cost. He surmised that by getting data from the building control panels rather than attaching to every appliance, he would get the aggregate electrical draws of every appliance in a building.

Along with his NetLogic colleague and friend, Jonathan Chu, Mark set out to tackle these questions based on his knowledge of deep packet inspection, which disaggregates and routes different types of packet data, such as voiceover IP or email. Mark and Jon knew the answers lay in creating specialized algorithms to disaggregate and identify multiple electrical signatures within one current. With an early prototype on a plug-strip, Mark and Jon were able to successfully disaggregate and tag the unique electrical signatures of individual appliances.

Mark and Jon patented their discoveries and officially incorporated Verdigris Technologies in June of 2010. When asked how they chose the name Verdigris, Mark stated, "Verdigris is the natural green patina that forms on copper over time. All over the world, electricity travels via copper wires. Verdigris Technologies is on a mission to "green" our electrical grid, building by building."

After meeting in 2009, Archan Padmanabhan also joined Verdigris in late 2010, bringing experience in electrical market modeling and Cleantech technology, specifically in the experimental high altitude wind energy space.

Today, Building.AI is a comprehensive platform with the groundbreaking ability to measure any building's elec-



In-progress installation of Verdigris buds.

tricity use down to a specific appliance. From the circuit panel, Building.AI can simultaneously and accurately measure as many as 1,000 different devices from each single sensor node, by sampling data 7,600 times a second. The algorithms are so powerful that they can sense an anomaly in an appliance's "fingerprint," indicating an imminent failure. Down the road, the Building.AI platform will add real-time alerts and notifications to optimize building efficiency, integrate with building automation systems, and participate in demand response and ancillary service markets.

As a leader in emerging technologies, NASA has played a pivotal role in engaging Verdigris under the Space Act Agreement and piloting Verdigris' technology at the LEED-Platinum NASA Sustainability Base. As a federal entity leading the charge in environmental sustainability, NASA sees real potential in a cost-conscious solution to continuously optimize the operation and maintenance of the Sustainability Base.

Verdigris has been largely self-funded by initial founders as well as friends, family, and advisors who share the vision of greening the grid. Verdigris is growing organically by gaining a steadily increasing pipeline of paying customers excited about the technology and its benefits.

Historically, electricity innovation has remained static. With the recent explosion of the Internet and availability of cheap data transmission and storage, a dynamic approach to monitoring is possible. Now, with the development of Verdigris' brain, Building.AI, the future of electricity monitoring is poised for a major shake-up. ♦

AAC Microtec-Supported 1U CubeSat Successfully Launched from ISS

by Jorge Freyer, CEO at AAC Microtec

TechEdSat is a NASA Ames Research Center 1U CubeSat built by San Jose State University student interns, in partnership with NRP tenant AAC Microtec. AAC Microtec provided the avionics and technical support to the NASA team.

Its mission is to evaluate Space Plug-and-play Avionics (SPA) designed in Sweden by AAC Microtec, the parent company of AAC Microtec, U.S. TechEdSat will perform a communications experiment utilizing the Iridium and Orbcomm satellite phone network.

TechEdSat was launched to the International Space Station (ISS) in July and was then deployed into Low Earth Orbit using the JAXA J-SSOD Japanese deployer. On October 5, TechEdSat, a small cube-shaped satellite, was launched from the ISS, and is being tracked by NASA engineers, student interns and amateur radio enthusiasts around the world.

TechEdSat measures about 4 inches (10 centimeters) on a side and carries a ham radio transmitter.

“TechEdSat will evaluate plug-and-play technologies, like avionics designed by commercial providers, and will allow a group of very talented aerospace engineering students from San Jose State University to experience a spaceflight project from formulation through decommission of a small spacecraft,” said Ames Director S. Pete Worden.

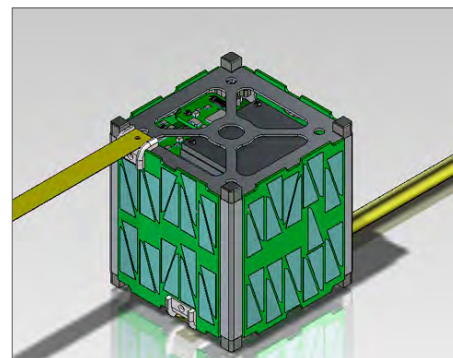


Image by NASA

TechEdSats swim free in orbit.

TechEdSat's mission showcases collaboration among NASA, academia and industry to set the standard for future endeavors with small satellites known as Cubesats. TechEdSat is funded by Ames and NASA's Space Technology Program. The total cost of the device was less than \$30,000 because engineers used only commercial off-the-shelf hardware and simplified the design and mission objectives.

For more about TechEdSat, visit SJSU's site at techedsat.com ◆



The TechEdSat, a collaboration with JAXA.



On September 18, 2012, the NASA Advisory Council Commercial Space Committee visited NASA Ames and NASA Research Park. Dr. Worden, Center Director, provided a welcome and Alexander MacDonald, Program Executive from Emerging Space Office, discussed commercial space opportunities. Meighan Haider, Deputy Director, NASA Research Park, conducted a tour of the NRP, and leaders from Singularity University and Scanadu discussed and showcased their efforts and technology.

NRP Post

Mars Institute: We are Go for Mars

by Pascal Lee, Chairman of the Mars Institute, a senior planetary scientist at the SETI Institute, and Director of the NASA Haughton-Mars Project at NASA Ames Research Center.

The Mars Institute (MI) is a 501(c)(3) not-for-profit research organization based at the NASA Research Park. MI's mission is to advance the science, exploration, and public understanding of Mars. Celebrating its 10th anniversary this year, MI is a global organization located at the heart of the highest-tech hubs in their respective countries, and all offering access to the Arctic, a strategic region on Earth for Mars analog field research. MI Canada, headquartered in Toronto, Ontario, manages the "Mars On Earth" site of the NASA Haughton-Mars Project (HMP) on Devon Island, along the Northwest Passage. MI Norway, based in Stavanger, Norway, offers ready access to the Svalbard Archipelago in the Arctic where NASA also conducts analog studies.

MI currently leads, or is involved in, a wide range of scientific research relating to the climatic and geologic evolution of Mars. It also studies the geologic evolution of small bodies—in particular, near-Earth asteroids (NEAs) and the moons of Mars, Phobos and Deimos, which are viewed as stepping stones to Mars. Astrobiology investigations are also part of the mix. Kira Lorber, a graduate research associate and project manager at MI, has been analyzing



Photo by Mars Institute/Kira Lorber

Figure 1. MI conducts simulations of the human exploration of Mars at Dumont Dunes, California. Among other investigations, samples were collected in support of a new study of sand dunes on Earth to assess their astrobiological potential in the search for life on Mars.

planetary protection concerns associated with the exploration of Phobos and Deimos, and is beginning a new study on the astrobiology of sand dunes, a fundamental and ubiquitous feature of the Martian surface (Fig.1).

Research at MI focuses also on the human exploration of Mars. While an actual manned mission to Mars may still be 15 years or more away, MI has been working on critical long lead time

items including spacesuits and deep drilling on Mars.

Spacesuits

A key piece of hardware for the human exploration of Mars is the spacesuit. Current spacesuits are inadequate for Mars for two key reasons: 1) they are too heavy to be used productively under Martian gravity (0.38g)—their mass needs to be cut in half; 2) they are not designed for extended work in dusty

Figure 2. ATV-spacesuit combo tested at Mars on Earth on Devon Island, High Arctic, by the Mars Institute and aerospace company Hamilton Sundstrand



Photo Haughton-Mars Project/Pascal Lee

environments, which makes them inadequate for other NASA destinations such as NEAs or the Moon. For several years now, MI has been working with aerospace company Hamilton Sundstrand (a division of United Technologies, and since Apollo, NASA's main contractor for life support systems) on both problems.

The issue of weight is being addressed by a combination of fundamental rethinking of the spacesuit's design, new approaches to suit operations, and new materials. MI proposed the use of individual all-terrain vehicles (ATVs) to alleviate suit weight for Mars extravehicular activities (EVAs.) MI has been conducting field tests with Hamilton Sundstrand at HMP on the use of ATVs in various Mars and Moon exploration scenarios (Fig. 2). A promising concept of operations is emerging: ATVs carrying external life support systems that can also double up as robotic scouts.

These ATVs could be deployed on Mars to tag along with human explorers engaged in pressurized rover traverses; a pressurized rover is a manned rover in which astronauts can live, drive, work, and sleep in shirtsleeves. Once a site of interest has been reached, astronauts don a spacesuit, hop onto an ATV, and drive off for local exploration. We can then put a significant part of the weight of a suit's portable life support system (PLSS, or the astronaut's backpack) on the ATV rather than on the astronaut's back. The nimble ATV could also accompany, transport, and resupply the astronaut during EVAs. The astronaut would no longer have to carry the burden of a full-sized PLSS, just a much lighter one.

The issue of dust is also being addressed by a combination of spacesuit system redesign, new concepts of operations, and new materials. A key problem with the classical use of spacesuits in conjunction with airlocks is that dust collected on suits during EVAs is brought back inside the habitat where it becomes a health hazard, destroyer of hardware, and janitorial burden for the crew. There is also



Figure 3. Field test of concept spacesuits and suitport interfaces in the Mojave Desert, California, at the U.S. Army's National Training Center at Fort Irwin. A modified Humvee, with aft suitports, was used as a pressurized rover simulator.

the issue of waste of resources as large volumes of breathable air are lost every time an airlock is vented for egress.

In recent years, NASA has been investigating a different approach: the use of suitports. Suitports are a setup in which spacesuits are never brought back into a habitat or rover, but dock via their backpack to a port mounted on the outside wall of the habitat or rover. The spacesuit always stays outside, and is donned and doffed by opening a double door containing the PLSS, and by sliding into, or out of, the spacesuit directly from, or into, the inside of the habitat/rover. In cooperation with NASA, MI and Hamilton Sundstrand have been conducting a series of field tests to evaluate such suitport systems at Mars analog sites in the Arctic, in Arizona, and in the Mojave Desert of California. With the suitport approach, dust is kept outside habitable volumes very effectively. In addition, resources in air supplies and even the time required for egress and ingress are reduced significantly compared to airlock operations.

Deep Drilling On Mars

MI is also looking farther into the future and has recently initiated a study of how to conduct deep drilling on Mars. While the martian surface is at present cold, dry, and subject to intense UV and high energy space radiation, the Martian subsurface offers much friendlier environments, including warmer, wetter, and radiation-shielded ones. Christopher Hoftun, an international student intern from Norway at MI, is analyzing the capabilities of current and foreseeable deep drilling technologies for Earth, and developing concepts and recommendations for future deep drilling on Mars.

The twenty-first century will undoubtedly be the century that will see humans reach Mars and explore our neighboring planet in detail. The Mars Institute views it as an endeavor that will likely be achieved by private and government partners worldwide working together. Short of being on Mars itself, MI's base at the NRP is exactly where they want to be. ♦

NRP Post

RMV Developments

by Renee Mitchell, Vice President, RMV Technology Group, LLC

NRP Partner RMV Technology Group, LLC has enjoyed significant growth in expanding electrostatic discharge (ESD)/Electromagnetic compatibility (EMC) and System Level Testing with an expanded ESD laboratory.



Figure 1. System Level Testing using IEC-61000-4-2

RMV has had some great projects at NASA Ames Research Center from personal robotics to medical device troubleshooting and development of an advanced level method to conduct Triboelectrification testing for space-bound materials and pharmaceutical delivery polymers to mitigate electrostatic attraction (Figure 2).

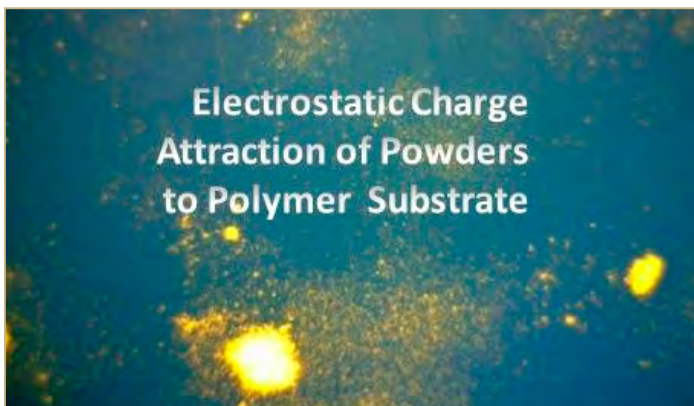


Figure 2. Particle attraction due to electrostatic attraction (ESA)

In September 2012, Bob Vermillion, Founder, RMV Technology Group, conducted a “hands on” Suspect Counterfeit Awareness Training Seminar for NASA Ames on the detrimental aspects of materials that compromise the supply chain in an aerospace environment. RMV illustrated a new method used by counterfeiters to remove ESD sensitive component identification for remarking (Figure 3).



Figure 3. Suspect Counterfeit method of removing a component's lettering that does not show evidence of tampering.

RMV Technology Group is a high technology, innovation driven Service Disabled Veteran Owned Small Business (SDVOSB) firm that is spearheading specialized Suspect Counterfeit Training, Packaging Engineering Design Services, Consulting, Training and Testing for aerospace & defense, medical device, pharmaceutical delivery, biotechnology and consumer electronic sectors.

A third party test laboratory, RMV teaches in a “hands on” instrument driven format for Engineers and Technicians how to handle, store and ship sensitive components, parts and products.



Figure 4. RMV trained 26 NASA-Ames engineers on September 26, 2012 and NASA is adopting this in mitigation of suspect counterfeit parts.

RMV trains incoming Inspection how to better protect the organization from Suspect Counterfeit products in the electronics supply chain. Participants learn how to Validate, Verify and Mitigate Suspect Counterfeit Materials, Packaging, Parts & Components for compliance to H.R. 1540 (Sec. 818) which is now being integrated into the Department of Defense (DOD) supply chain.

Suspect Counterfeit training should include the operator, the supervisor, the engineer, management and procurement to insure implementation from the top down. ♦

IntraPoint Continues to Establish Itself as the Global Leader in Enterprise Resiliency

by Edward Erickson, VP of Solutions and Business Development at IntraPoint, Jasmine Rezai, Marketing Intern at IntraPoint

Government

IntraPoint continues to draw global attention from leading Enterprises and Governments alike. A recent visit by the Education and Research Committee of the Norwegian Parliament underscored this point. The committee wanted to understand why IntraPoint had decided to open an office in the Park and after learning more about the Enterprise Resiliency Solution they wanted to better understand the possible benefits of this Solution to tragedies such as that which occurred in Norway on July 22, 2011.

The US Government has also expressed an interest. IntraPoint briefed leaders at the White House last Halloween on Resiliency and is in discussions with NASA at the Johnson Space Center on a number of risk related topics. Most recently, the Solution drew attention by the New Jersey Fusion Center, one of 77 across the country.

Enterprise

In the private sector, IntraPoint continues to expand across new sectors and geographies. IntraPoint's customer base was established within critical infrastructure in the Nordics. Customers such as Shell Oil, Stat Oil, Iceland and Alitalia Airlines as well as Maersk are loyal IntraPoint customers. Recently, IntraPoint has proven the versatility of the Solution at Tulane University where the solution proved itself in Hurricane Isaac. The Moffett Park Business Group, a consortium of Businesses, which includes NetApp, Infinera, Lockheed and Juniper Networks, used the solution to run their first ever-joint Crisis drill on October 30th.

Technology

The Enterprise Resilience Solution (ERS) helps clients manage disruptions of every severity through Cloud Native Software. The Solution addresses all elements of the risk Lifecycle: 1) Risk Assessment 2) Planning 3) Training 4) Mobilization 5) Response Management 6) Reporting & Refining. The Solution also incorporates Services that span from technology Integration, customization and configuration to Resiliency program design in Supply Chains and the Enterprise.

Collaboration

IntraPoint is focused on enhancing collaboration in the field of resiliency. Edward Erickson, IntraPoint's VP of Solutions and Business Development, founded both the Supply Chain Risk Leadership Council (SCRLC) and the Security, Resilience, & Technology (SRT) Integration Forum. Both of these groups connect academics and industry to propel the field of resiliency forward.

SCRLC Website: <http://scrlc.com>

IntraPoint Website: <https://www.intrapoint.com> ◆

ARCTek 3

by Ingrid Desilvestre, Program Executive, Office of the Center Chief Technologist

Members of the Ames community gathered at the invitation of the Ames Center Chief Technologist (CCT) at ARCTek 3 on October 16 to hear about the pending release of the 2013 Center Innovation Fund (CIF) call. Associate Director Steve Zornetzer, Chief Technologist John Hines, and CIF Program Executive Minoo Dastoor of the Office of the (Agency) Chief Technologist (OCT) talked about how national and Agency objectives inspire Center-driven ideas; capturing and enabling the most promising of these new ideas is one of the key objectives of CIF. Ideally, these innovative ideas will catalyze follow up activities.

For this CIF solicitation, concepts would have to be aligned with the Space Technology Roadmaps or with one of the seven Ames Strategic Initiatives, though investigators could also offer up unrelated concepts that nevertheless show great technology potential. John Hines invited feedback on the draft solicitation and the selection criteria. (For more information, visit <http://1.usa.gov/RtrPi5>)

Following that discussion, twenty-two three-minute "lightning presentations" introduced some of the more innovative concepts that might be proposed in response to the CIF call. Subjects included nano-devices, launch vehicle venting, software validation, data-mining, lunar plants, green satellite propulsion, and hypersonic vector control. The CCT's hope was that by bringing together all center staff, NASA Research Park, and other industry, academic, and government organizations, the participants might explore potential teaming opportunities. Many of the presentations are available on the CCT website (<http://1.usa.gov/YTrcNv>). About 30 people who were unable to attend in person—including people from Headquarters and other NASA Centers—followed the proceedings via Adobe Connect.

ARCTek aims to bring the ARC technology community together in order to communicate and discuss the Center's technology opportunities, focus and future directions. Previous ARCTeks sought to clarify Ames' management vision concerning national and agency needs and directions, achieve a common Ames' vision of our technology future, and showcase CIF investigators. They have also featured "success stories," featuring PIs who have taken an idea from concept to flight.

Whether ARCTek 3 succeeded in igniting ideas for collaboration will be known when the proposals are received. But the meeting has already received kudos from some participants. "The ARCTek conferences/workshops are a unique opportunity to meet with our ARC partners to discuss recent and planned events, and hear about select projects at the Center,"

ARCTek 3 cont'd on page 16

to high quality reporting. Sure, we will have coverage of the people and events that are spinning out of Singularity University. We expect, in fact, that many of the amazing people that have been hanging out at Singularity University will start spending more time here at the Hub, as readers, guest posters, and contributors to the Hub community! But most of our coverage at Singularity Hub will still be about the amazing things that are happening outside the University, just as it always has been. We will continue to provide a balanced, insightful, and critical view of the sci/tech developments around the world that we find most relevant and interesting to our readers.

For those that want a little history, I founded Singularity Hub about five years ago with the mission to create the best singularity focused news site on the planet. Well, actually, during the first six months or so maybe I wasn't really sure what I was doing. But shortly thereafter my vision for the site quickly coalesced around that goal. The founding of Singularity Hub actually precedes the founding of Singularity University, which was incorporated four years ago. I was at the founding meeting of Singularity University, and I was an early supporter of its creation. During all of these years, however, Singularity University and Singularity Hub have been completely unrelated entities and the two companies surprisingly had never formally collaborated in any way. Recently, however, Singularity University CEO Rob Nail and I came to the realization that our two organizations would make a perfect combination, ultimately leading to today's announcement.

I'd like to say thank you to the amazing team of writers on staff here at Singularity Hub that produce the fabulous content that we consistently offer every day. I'd also like to thank all of

our readers for supporting us and coming here each day to read and discuss what we have to say. And a huge shout out to my awesome wife who is always by my side! Now, as the Hub joins Singularity University, our community and our news coverage will gather new energy, ideas, and people. Indeed, the best is yet to come!

Speaking of new people joining our community, I'll close below with quotes about the acquisition from some of our newest members

Peter Diamandis, Singularity University Executive Chairman and author of The New York Times best-seller "Abundance": "The majority of the news we hear today is repeatedly negative, and follows the old adage: "if it bleeds it leads." Singularity Hub is one of the best places to go to learn about the incredible breakthroughs and positive news that are transforming our world and creating an age of abundance. If you want to understand all of the amazing progress going on in the world at an increasing rate, get your news here."

Rob Nail, Singularity University CEO: "We are thrilled to now have Singularity Hub as our media platform to increase awareness about the implications of fast-moving technologies, and make our content more accessible to the world. Keith is intimately in tune with exponential thinking and the vision that we have at SU. Singularity Hub showcases many of the rapidly accelerating technologies and trends that we see as disruptive forces for the foreseeable future."

Ray Kurzweil, Mr. Singularity: "I'm an avid Singularity Hub reader. There's some great in-depth material that really looks at all of the singularity ideas. It's really quite unique!" ♦



The Norwegian Parliament's Education and Research Committee visited NASA Research Park on September 20, 2012 to learn about the NRP as a model for public-private partnerships. Dr. Pete Worden, Ames Center Director, provided a Center Overview; Michael Marlaire, NRP Director, provided a NRP Overview. The group



also met with Edward Erickson, VP of Business Development for IntraPoint, an NRP partner.

said Jim Juve, Director of Special Projects at Wyle Corporate Offices. "ARCTek helps promote teamwork and knowledge of the Ames mission and key initiatives, and is a valuable resource for the Ames community."

NASA has been, and to a great extent still is, at the cutting edge of technology for the U.S. Government. The creativity and innovative spirit that fuel NASA are located at the NASA Centers—particularly at Ames, located as it is beside the NASA Research Park in the middle of Silicon Valley. Innovative partnerships will help maintain Ames' reputation as NASA's "go-to" center for technology and innovation. ♦

NRP Post

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