

NRP's Bloom Energy Debuts Advanced Fuel Cell to Change the World



(L-R) California Governor Arnold Schwarzenegger with Bloom Energy Principal Co-Founder and CEO K.R. Sridhar, Phd, at Bloom Energy launch Feb. 24, eBay Townhall, San Jose, CA

Bloom Energy Staff, Sunnyvale, CA

NRP Partner Bloom Energy Corporation, a Silicon Valley-based Company committed to changing the way people generate and consume energy, announced Feb. 24 the availability of the Bloom Energy Server™, a patented solid oxide fuel cell (SOFC) technology that provides a cleaner, more reliable and affordable alternative to both today's electric grid as well as traditional renewable energy sources. The Bloom Energy Server provides distributed power generation, allowing customers to efficiently create their own electricity onsite.

The company introduced its groundbreaking technology at eBay Inc. headquarters with a keynote by California Governor Arnold Schwarzenegger, Bloom Energy Board Member General Colin Powell and several of its early customers. Built using abundant and affordable materials, Bloom's fuel cell technology is fundamentally different from the legacy "hydrogen" fuel cells. The Bloom Energy Server is distinct in four primary ways: it uses lower cost materials, provides unmatched efficiency in converting fuel to electricity, has the ability to run on a wide range of renewable or traditional fuels and is more easily deployed and maintained.

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NASA Technology Comes to Earth*

Bloom Energy can trace its roots to work performed at the University of Arizona as part of the NASA Mars space program. Dr. KR Sridhar and his team were charged with creating a technology that could sustain life on Mars. They built a device capable of producing air and fuel from electricity, and/or electricity from air and fuel.

They soon realized that their technology could have an even greater impact here on Earth.

In 2001, when their project ended, the team decided to continue their research and start a company. Originally called Ion America, Bloom Energy, was founded with the mission to make clean, reliable energy affordable for everyone on earth.

In 2002, John Doerr, and Kleiner Perkins became the first investors in the company. Kleiner Perkins was legendary for its early backing of other industry changing companies, like Google, Amazon.com, Netscape, and Genentech, but Bloom was its first clean tech investment. In fact, at that time, clean tech was not even really a word.

With financing in place, the team packed three U-hauls and headed to NASA Research Park at Ames Research Center in Silicon Valley to set up shop. Over the next few years, the technology quickly developed from concept, to prototype, to product, as the major technological challenges were solved and the systems became more powerful, more efficient, more reliable, and more economical.

In early 2006 Bloom shipped its first 5kW field trial unit to the University of Tennessee, Chattanooga. After two years of successful field trials in Tennessee, California, and Alaska, to validate the technology, the first commercial (100kW) products were shipped to Google in July 2008.

Since that time Bloom's Energy Servers have helped our customers generate millions of kWhs of electricity and eliminate millions of pounds of CO2 from the environment.

From humble beginnings on Mars, Bloom Energy is now changing the Earth for the better.

*<http://bloomenergy.com/about/company-history/>

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Carnegie Mellon Silicon Valley Launches Research Center & Initiative in Advanced Communications & Disaster Management

by Nichole Dwyer, Manager of Web Communications
Carnegie Mellon CyLab

Late in 2009, the International Center for Advanced Communication Technologies (interACT) launched its latest site at Carnegie Mellon Silicon Valley. With sites in Pittsburgh, Germany, Hong Kong and Tokyo, Silicon Valley marks the fifth center that interACT has launched.

InterACT's mission is to carry out scientific research on Advanced Communication Technologies as well as to promote and facilitate education in an international, cross-cultural setting. The research emphasis is in speech recognition, language processing, speech translation, multimodal and perceptual user interfaces. The research team at Silicon Valley campus includes Director Dr. Alex Weibel, professor of computer science; Dr. Ian Lane, systems scientist; Dr. Joy Zhang, assistant research professor; and Dr. Matthias Eck, research technician.

The Silicon Valley team was the first to successfully deploy a full-scale statistical machine translation application on a mobile device.



Dr. Joy Zhang and Dr. Matthias Eck introduce Jibbiggo App

"In the past, people used grammar-based translation techniques, which requires human efforts in writing grammar rules to build up a translation lexicon. However, this is expensive to build and difficult to deploy for any new set of languages and domains. By using data-driven machine translation, we are able to learn the translation model automatically from a set of translation examples. This allows us to create a new set of systems for new languages or new domains in a much shorter time frame," said Dr. Zhang, machine translation expert.

The first project to come out of interACT's research at the Silicon Valley site is Jibbiggo. Jibbiggo is an iPhone app that translates language back and forth. The Jibbiggo app has been tremendously successful, becoming one of the top travel apps, even rising to the number one selling app in Japan. It was also submitted to CrisisCampHaiti to aid in relief efforts after the devastating earthquake in January. A translation app is critical for relief efforts in Haiti when volunteers, including medical professionals, who do not speak the local language are on the ground aiding Haitians.

Also aiding in disaster recovery is the newly established Disaster Management Initiative (DMI). Launched by Carnegie Mellon Silicon Valley and the CyLab Mobility Research Center, DMI is a new technology partnership and incubator that brings together key partners and individuals to collaborate on next-generation solutions for more effective management of disaster and emergency response among the public, emergency responders and command centers in California and beyond.

The DMI held its first workshop, "Disaster Management and Emergency Services: Next Generation Device, Communication, and Collaboration Technologies" on March 26, 2010. The workshop focused on defining the framework for new devices, communication and

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collaboration technologies and identifying projects to be explored further during CrisisCampSiliconValley. Agenda items at the DMI workshop included panels with many DMI partners covering sensors, mobile devices, WiFi, 3G and 4G networking, systems integration, common operating picture and next-generation emergency operation centers.

Following the DMI workshop, Carnegie Mellon Silicon Valley hosted CrisisCampSiliconValley on March 26-28. Notable attendees included Matthew Bettenhausen, Secretary of CalEMA (California Emergency Management Agency) who gave the keynote, and Mike Dayton, Deputy Director of Legislative Affairs for California Homeland Security.

CrisisCamps brings together domain experts, developers and first responders around improving technology and practice for humanitarian crisis. In the first quarter of 2010, we've already seen natural disasters in California, Haiti, Chile, New Guinea, Cuba and Japan.

"Natural disasters occur worldwide killing tens of thousands of people, and in some cases hundreds of thousands of people, at a time," said Dr. Martin L. Griss, director of Carnegie Mellon Silicon Valley. *"Advances in technology can predict threats*

sooner, accelerate response times and provide new communication channels, ultimately saving lives, and many of those innovations were born in Silicon Valley. The goal of our Disaster Management Initiative and CrisisCampSiliconValley is to be a driving force behind the further development of new technologies that will encourage innovation and a renewed focus on the area of disaster management."

While interACT will advance communications technology and DMI will bring together collaborators in management and response, both will develop research to further disaster relief. Their work will push technology from useful to necessary for disaster recovery and humanitarian efforts.

To learn more about interACT, visit sv.cmu.edu/research/interact/.

To learn more about the Disaster Management Initiative, visit dmi.sv.cmu.edu.

Unlike traditional renewable energy technologies, like solar and wind which are intermittent, Bloom's technology can provide renewable power 24/7. Each Bloom Energy Server provides 100 kilowatts (kW) of power in roughly the footprint of a parking space. Each system generates enough power to meet the needs of approximately 100 average US homes or a small office building. For more power, customers simply deploy multiple Energy Servers side by side. The modular architecture allows customers to start small and "pay as they grow."

Bloom's customers have deployed the solution to lower and/or fix their energy costs, while significantly cutting their carbon footprint and enhancing their energy security by reducing their dependence on the grid. Customers who purchase Bloom's systems can expect a 3-5 year payback on their capital investment from the energy cost savings. Depending on whether they are using a fossil or renewable fuel, they can also achieve a 40-100% reduction in their carbon footprint as compared with the U.S. grid. Customers announced today include Bank of America, The Coca-Cola Company, Cox Enterprises, eBay, FedEx Express, an operating company of FedEx Corp, Google, Staples, and Walmart.

Since the first commercial customer installation in July 2008, Bloom's Energy Servers have collectively produced

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NASA DART Chief Robert Dolci leads tour of NASA Ames DART Collapsed Structure Rescue Training site

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more than 11 million kilowatt hours (kWh) of electricity, with CO2 reductions estimated at 14 million pounds – the equivalent of powering approximately 1,000 American homes for a year and planting one million trees.

“Bloom Energy is dedicated to making clean, reliable energy affordable for everyone in the world,” said Dr. K.R. Sridhar, principal co-founder and CEO of Bloom Energy. *“We believe that we can have the same kind of impact on energy that the mobile phone had on communications. Just as cell phones circumvented landlines to proliferate telephony, Bloom Energy will enable the adoption of distributed power as a smarter, localized energy source. Our customers are the cornerstone of that vision and we are thrilled to be working with industry leading companies to lower their energy costs, reduce their carbon footprint, improve their energy security, and showcase their commitment to a better future.”*

Powder to Power – How It Works

Founded in 2001, Bloom Energy traces its roots to NASA's Mars space program. Sridhar and his team were charged with building technology to help sustain life on Mars using solar energy and water to produce air to breathe and fuel for transportation. They soon realized that their technology could have an even greater impact here on Earth and began work on what would become the Bloom Energy Server.

The Bloom Energy Server converts air and nearly any fuel source – ranging from natural gas to a wide range of biogases – into electricity via a clean electrochemical process, rather than dirty combustion. Even running on a fossil fuel, the systems are approximately 67% cleaner than a typical coal-fired power plant. When powered by a renewable fuel, they can be 100% cleaner. Each Energy Server consists of thousands of Bloom's fuel cells – flat, solid ceramic squares made from a common sand-like “powder”.

“Today we witnessed something special,” said John Doerr, partner at Kleiner Perkins Caufield & Byers and Bloom Energy board member. *“This is a new kind of product Announcement, coming long after a product has shipped and directly from marquis customers. For years, there have been promises of new energy solutions that are clean, distributed, affordable, and reliable. Today we learn that Bloom, formerly*



Bloom Energy Servers installed in summer 2009 at eBay headquarters, San Jose, CA. Other early adopters of Bloom Energy Servers include Google, Inc., Walmart, Coca Cola, Bank of America, Cox Enterprises, FedEx Express and Staples.

in stealth, has actually delivered. Americans want clean, affordable, energy, 24x7 – and all the jobs that go with it. Bloom's boxes are a breakthrough, serving energy, serving demanding customers, and serving our country.”

Bloom Energy's management team possesses expertise across a number of relevant industries, including aerospace, high volume manufacturing, semiconductors, automotive, naval nuclear, and Silicon Valley startups. In addition to CEO Sridhar, the company's board members include John Doerr, partner, Kleiner Perkins Caufield & Byers; General Colin Powell, former U.S. Secretary of State; Scott Sandell, general partner, New Enterprise Associates (NEA); T.J. Rodgers, chairman, SunPower; and Eddy Zervigon, managing director, Morgan Stanley. Bloom

Energy's investors include Kleiner Perkins Caufield & Byers, representing the firm's first clean tech investment, as well as Morgan Stanley, NEA, and Northgate Capital.

Bloom Energy, a partner in NASA Research Park since 2004, has been featured on 60 Minutes, in Newsweek and Fortune Magazines among others.

“NASA is a tremendous environment for encouraging innovation—it's all about solving problems that are seemingly unsolvable. After realizing that we could make oxygen on Mars, making electrons on Earth seemed far less daunting. We're grateful to NASA for giving us a challenge with serendipitous impact for mankind.”

- K.R. Sridhar

Could Investors Fund City's Transit Future?

Council resolution favors general concept of 'personal rapid transit'

by Daniel DeBolt, Mountain View Voice Staff, April 1, 2010

A company that has set up shop at NASA Research Park claims its system for automated pod travel could lift Mountain View out of its traffic and public transportation woes -- and the city may not have to spend a dime on it.

So claims Unimodal Systems LLC., which says that for the first city to say yes, it can build its SkyTran system -- small cars or "pods" which move about automatically on a network of rails, heading to their destination at the push of a button -- while getting all of the funding from private investors.

"Investors have told us, bring us a project and we'll finance it," said Robert Baertsch, Unimodal's vice president of software engineering.

Though the jury is still out on the merits of such a system, the City Council has already made a preliminary step in its favor. On Feb. 23, the council unanimously supported *"the general concept of an automated personal rapid transit (PRT) system in Mountain View"* after being lobbied by another PRT company -- one not located at Moffett -- called ULTra.

The city is considering a PRT system from the downtown train station to the Shoreline area, where young employees from Google and Microsoft are expected to embrace its cutting-edge means of moving people around.

Council members say it is premature to call PRT their favorite transportation solution for the Shoreline area, but so far its purported low cost and efficiency looks attractive in comparison to the light rail and shuttle services touted

for Shoreline Boulevard over the years. Light rail projects have cost \$100 million per mile while SkyTran would cost only \$10 million per mile, according to Baertsch. The company claims its passive magnetic levitation technology is a breakthrough in terms of cost and efficiency.

Baertsch said his company is "getting extremely close" to securing several million in venture capital funding to finish developing SkyTran.

Unimodal believes SkyTran fares could generate revenue for local government agencies while buses and light rail do not. In tough economic times, Baertsch said, Mountain View officials may be happy to know that the first city to agree to a SkyTran system will not have to spend a dime on it.

That city would also get a SkyTran factory as part of the deal, Baertsch said, *"That's part of the package."*

Valley Support

San Jose International Airport and the University of Michigan are among other locations considering a SkyTran system. But while Michigan's desire to reinvent itself as the center of transportation technology is attractive, Unimodal wants to create what it believes will be a multibillion dollar industry in Silicon Valley, said Elizabeth Thompson, the company's director for strategic partnerships.

The technology still has to be tested, and Unimodal is planning to build a 1,000-foot oval test track on the tarmac behind Hangar Two at Moffett Field. NASA Ames director Pete

Worden is highly supportive of the project, and the space agency's technology is expected to find its way into SkyTran engineering, Baertsch said.

Unimodal envisions a system serving a redeveloped NASA Research Park, running across Stevens Creek to Google headquarters, to downtown Mountain View and eventually expanding all the way to the San Jose airport, where a request for proposals for

a PRT project connecting it to the Santa Clara train station is expected later this year, Baertsch said.

New Relevance

The City Council's resolution opens the door for PRT to be studied for the Shoreline area as the city updates its General Plan. The council has supported allowing Google, Microsoft and other companies to build buildings up to seven stories high in the Shoreline Area, which could pose traffic management challenges for the neighborhood north of Highway 101.

"How we get around is probably just as important to think about as the buildings themselves," said council member John Inks.

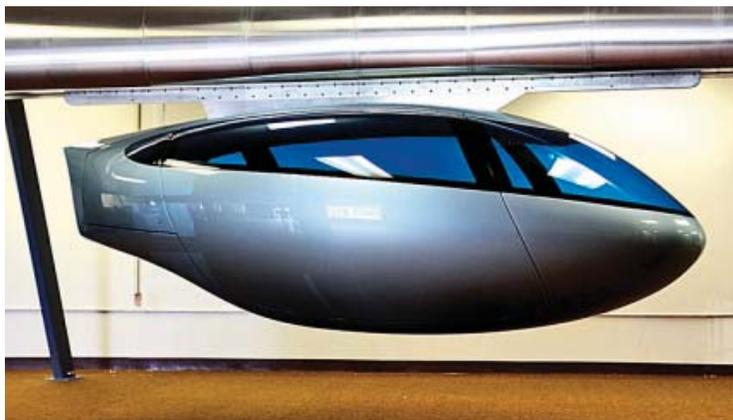


Photo: Michelle Le

SkyTran's lightweight personal compartments can transport up to three passengers. Travelers board the pod-like vehicles and select their destination on a touch screen.

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Council member Mike Kasperzak said he finds the idea of PRT in Mountain View “exciting” and was impressed with SkyTran’s prototype during a recent visit to Unimodal’s modest facility at NASA Ames.

And on a recent trip to London he was able to experience the ULTra PRT system being tested at Heathrow Airport. Ultra’s pods are battery powered cars riding on cement paths at up to 30 miles per hour. He said the ride was “smooth” and something like a ride at Disneyland.

Steve Raney, principal for ATS ULTra North America, said Mountain View was the first city in the country to pass a resolution in favor of PRT as a concept.

Despite the interest, in tough budget times council members said it was unlikely the city could fund such a project. An 8.5-mile-long system with 24 stations would cost between \$60 million and \$130 million, according to a city staff report.

How to Fund

Among the fans of Personal Rapid Transit and SkyTran is transportation guru Rod Diridon, executive director of the Mineta Transportation Institute. He said the city could probably qualify for federal funding for the project if necessary, especially if it could be shown that it would create jobs quickly.

To qualify, matched funding of 20 percent would have to come from the city’s Shoreline Community tax district, the Valley Transportation Authority or the Shoreline tech companies that would make use of PRT. Before federal funds could even be applied for, the city would have to find \$1 million for initial studies, Diridon said. He recommended working with the VTA to expand PRT regionally.

Unimodal has already worked with Google, which considered using SkyTran to connect a new million-square-foot campus at NASA Ames to Hangar One, which they have considered using as a parking lot, Baertsch said. And Google’s co-founder, Larry Page, has made comments about his personal interest in PRT technology.

The city of San Francisco asked SkyTran for the costs of a seven-mile system on Geary Street. Using the current fare box revenue for the Geary Street buses, Baertsch calculated that the system would begin to turn a profit after four years. More than 3,000 people per square mile are needed to make a profit with SkyTran, the company says, and Mountain View has about 6,000 people per square mile.

High Speeds

The light rail system in Santa Clara County has been little used in part because of its slow speed -- it averages 12 miles per hour in some places. SkyTran plans for 50 mile per hour speeds just to start off, but is designed to reach up to 150 miles per hour. Unimodal claims that one SkyTran guideway can provide the capacity of three freeway lanes.

Because of its light weight, the system supposedly can be mounted from light poles—no expensive new infrastructure needed. Unimodal says SkyTran’s benefits are due to its “passive mag-lev” technology the company is developing, which allows the pods to basically float on their overhead guideways once at speed.

If PRT really turns out to be affordable and safe (Unimodal says it is 20 times safer than a car and safer than flying), then its appearance may be its hardest selling point.

“It looks kind of futuristic,” said council member Margaret Abe-Koga. *“I’m not sure if folks would be open to that.”*

Baertsch said Unimodal was not attached to the exterior design of the pods, and joked that the company would build retro style pods that looked like San Francisco trolley cars if that’s what people wanted.



Robert Baertsch, vice president of software engineering for Unimodal, shows off a SkyTran pod prototype at NASA Research Park.

Photo: Michelle Le



California Poppy (*Eschscholzia Californica*) at Ames.

Space Business Roundtable Kicks Off with Cureton Event



Linda Cureton, NASA Chief Information Officer, NASA Headquarters, Washing. DC, kicks off the first Silicon Valley Space Business Roundtable at the Hilton Santa Clara.

CIO Linda Cureton spoke on March 22, 2010 at the inaugural luncheon of the Silicon Valley Space Business Roundtable (SVBR). The event was attended by over 150 members of the Bay area's aerospace community, representing 30 commercial, government and university organizations.

The Silicon Valley Space Business Roundtable is a new organization founded by NRP resident Joy Colucci of SGT and Khalid Al-Ali of the UARC. The non-profit organization encourages the growth and development of aerospace-related business in California's Silicon Valley.

Ames' Jack Boyd introduced Cureton, who spoke about her vision for the future of NASA's IT infrastructure in her presentation entitled "How to Make NASA IT Stellar".

The mission of the NASA IT organization is to increase the productivity of scientists, engineers, and mission support personnel by responsively and efficiently delivering reliable, innovative and secure IT services.

NASA's IT organization is one of the most highly regarded federal IT organizations, a sought-after innovator, and respected partner for NASA's mission and mission support organizations – and innovation was a key theme in Cureton's presentation. Cureton explained that we can learn a lot about innovation by looking at lessons taught to us by the tiny mustard seed, as tiny seed blossoms into a large sprawling plant and has many uses. So too, small amounts of innovation can blossom into extensive capabilities that can give your organization the ability to adapt, grow, and thrive.

SVSBR provides forums by leading aerospace leaders to educate the industry on new initiatives and goals. SVSBR educational outreach programs will also encourage students to enter these fields by their support to educational institutions in the Silicon Valley. Each quarter, the SVSBR will hold an event with invited government guests and speakers. This allows members opportunities to network with invited guests including prominent political and government leaders and colleagues from local companies. Selected speakers represent a cross-section of top political, NASA, and DOD leaders. For future event and membership information, see www.svsbr.org.



Bay Area aerospace professionals at SVSBR's inaugural event. The roundtable series was founded by NRP's Dr. Joy Colucci, SGT (Stinger Ghaffarian Technologies) and Dr. Khalid Al-Ali, UARC (University Affiliated Research Center).

Converting Conventional Landscapes to California Native Gardens

Photos by Kathleen Burton

Native plantings are located at Ames' Bldgs. 200, 235, 269 and at NRP's Bldg. 3 with plans to further expand native plantings to NRP by Ames' JC Division.



Hummingbird Sage (Salvia spathacea): California native perennial which attracts Anna's and other California Hummingbirds.



California Lilac (Ceanothus), an evergreen, drought tolerant native.

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Airship Earth at NASA Research Park

by Thomas Grimm, Chief Innovation Officer
Airship Earth

Airship Earth, a new media production, technology and telecommunications group, co-founded by Kathryn Schubel and Thomas Grimm, is a proud member of the NASA Research Park community of academic, industry and government partners. Kathryn holds a PhD in Earth and Planetary Sciences, with extensive experience in formal and informal education, interactive exhibit display systems, and distance learning technologies. Thomas is a new media entrepreneur, filmmaker and former lead technical designer of Landscape Carbon Analytics for the Clinton Foundation.

Kathryn and Thomas see potential in a new generation of ultra-scale, high resolution display networks linked to high performance graphics processing clusters, especially in Earth and Environmental Sciences, Informal Education and Emergency Management. Dubbed "HIPerSpace," these highly interactive arrays developed by researchers at the Calit2 at UCSD, that can simultaneously present a mix of streaming high definition media from observatories and sensor networks in interactive environments that allow researchers, decision makers and students collaborate in exploring and understanding complex subjects, such as climate change, ocean acidification and biotechnology. In Aquariums and Science Centers, HIPerSpace presentations of Discovery Channel, National Geographic programming can be greatly enhanced with live streaming media from observatories and content experts.

The focus of Airship Earth is to work with the developers of HIPerSpace technologies to develop user communities and new venues for HIPerSpace display systems. Airship Earth is currently designing a stand-alone HIPerSpace Ocean Observatory for the Aquarium of the Pacific, located in Long Beach, California, where educators, students and the public will be able to explore gigapixel-size graphics and streaming media from space, land and sea-borne observatories, research vessels, buoy sensors, autonomous underwater vehicles, seafloor instruments and deep sea moorings.

HIPerSpace is an unparalleled visualization resource for informal education, allowing guests and content experts to gather in front of displays in far-flung locations as if they were in the same room. The display system's storytelling capacity extends advances in simulation, data streaming, and human-computer interaction to a broader public. HIPerSpace has a unique capacity to bridge global environmental knowledge gap through their capacity to distribute massive amounts multifaceted, multidimensional data in shared, virtual spaces. Each new HIPerSpace installation adds to the growing global community connected by advanced, multi-gigabit-per-second networks. As policy-makers, business leaders, and scientists grapple with climate change, biodiversity and habitat loss, land degradation, water pollution, depleted fisheries, rising sea levels, ocean acidification and the challenges of the Urban Ocean, new HIPerSpace Portals can provide new collaborative spaces that will help distant research communities work ever more effectively together. HIPerSpace Portals represent a powerful new global resource for understanding the complex environmental processes that directly impact human society and the global climate, upon which all life depends.



NRP Partner Magenn Power Inc. aims to produce electricity at 1,000 feet through helium-filled tethered wind turbines. The aerostats could be especially useful in poor or remote regions without an electrical grid, and could be quickly deployed after natural disasters that cause major damage to electrical infrastructure.

Another powerful application of HIPerSpace technology will be in the area of Emergency Management. Multidimensional data associated with large-scale disasters is growing exponentially, overwhelming rather than enhancing the coordination of emergency response operations. HIPerSpace Portals can provide

First Responders and Incident Commanders with effective new ways of analyzing, processing and converting complex data into actionable intelligence and more coherent response. Airship Earth is collaborating with Carnegie Mellon and Geodan, a Geoinformatics specialists based in the Netherlands to display Emergency Management "Common Operating Pictures." HIPerSpace COP applications will be designed to collect and filter space-borne, airborne and ground-based data, including building and infrastructure sensor data and social media geotagged time stamped data, fusing and sharing critical data.

Airship Earth and Magenn Power

In an effort to address the need for emergency power and telecom needs that can hobble Disaster Response effectiveness, Airship Earth entered into a Teaming Agreement with Magenn Power, to co-develop lighter-than-air, wind powered aerostats that can provide emergency power and communications in disaster areas. Their shared goal is to develop rapidly deployable emergency power. Antenna and surveillance payloads are being developed to restore cellular communication impacted by disasters while providing high resolution, continuous surveillance over landscapes impacted by earthquakes, hurricanes and wildfires. As operational experience builds and funding becomes available, the team intends to fly aerostats with increasingly capable payloads. Pierre Rivard, CEO of Magenn Power expressed enthusiasm about the teaming agreement, *"Airship Earth has been a God-send to Magenn Power. This teaming agreement will greatly accelerate our R&D activities at NASA Research Park."*

SPACE SYSTEMS/LORAL to Provide Space-Proven Propulsion System for Moon Exploration

Palo Alto, CA

Space Systems/Loral, a subsidiary of Loral Space & Communications and the leading provider of commercial satellites, announced Jan. 6, 2010, it has been selected to provide a propulsion system to NASA Ames Research Center for the Lunar Atmosphere Dust Environment Explorer (LADEE) spacecraft.

"We are pleased to have this opportunity to work with our neighbor NASA Ames, and to help the U.S. Government leverage the extensive heritage and mission capability of technologies developed for commercial satellites," said John Celli, President of Space Systems/Loral. *"NASA Ames has designed a versatile spacecraft platform for unmanned space exploration and our propulsion system is available as a long-term solution for these important scientific missions."*



Artist rendering of NASA's LADEE Spacecraft planned for launch in 2012.

NASA's LADEE spacecraft

is a small observatory planned for launch in mid-2012 to study the moon's thin atmosphere and dust above the lunar surface. The LADEE propulsion system will be a variant of the mission-critical system used for many years on SS/L's geostationary satellites for television, radio, broadband internet, meteorology and other services. Currently there are 59 SS/L-built satellites orbiting Earth, and the company has logged more than 1,600 satellite years on orbit.

According to Stevan Spremo, LADEE deputy project manager at NASA Ames, *"The LADEE mission will help researchers understand how the lunar environment will affect future explorers. Space Systems/Loral understands the importance of this mission and presented a unique propulsion solution for our Modular Common Spacecraft Bus. Working with a commercial manufacturer is helping NASA meet demands for a lower-cost approach to science missions."*

"Loral has a long standing Space Act Agreement with NASA Ames' Airfield Management Office to transport the satellites, and an Enhanced Use Lease with NASA Research Park to store satellite containers and thermal vac in Hangar 2," said Mejjhan Haider, Chief of Business Development at NRP.

NRP Post

Greene, Gold, and Bright Green: Guerilla Geeks Take Action To Empower Women

by Miki Huynh

Andrew Gold, Founder of I-Net Solutions Inc., and Laina Greene, CEO of GetIT Inc., are venturing forth into Bangladesh. They've a business for a sustainable non-profit venture called Bright Green Energy USA, formed in partnership with Bright Green Energy Foundation, the grassroots organization started by Dipal Barua, Zayed Future Energy Prize recipient, co-founder of Grameen Bank and Founder of Grameen Shakti.



Andrew Gold and Laina Greene at NRP

Bright Green Energy (BGE) is a microcredit program focused on empowering communities in Bangladesh through training women. The women receive training at BGE's Green Technology Centers located within 10 miles of a rural community, and up to 200 women can be trained at a time. Within a three week training course, these women learn how to install home solar systems, self manufacture



Margarita Quhuis, Research Fellow at Stanford Persuasive Technologies Lab, Stanford students Diane Lee, Yang Hong, Stephany Sy, Patricia Ho, and Clay Sader with Greene and Gold after a BGE USA marketing strategy presentation.

DC to DC convertors, charge controllers and solar lighting devices and find themselves able to dramatically increase their income and improve their quality of life. They receive clean energy, access to communications and clean lighting for less than the price they pay for kerosene and eliminate their family's exposure to indoor air pollution. In addition the equipment has a useful life of over 20 years and they end up owning the system outright after 3 years – you do the math – 17 years of nearly free clean energy! (<http://www.makingitmagazine.net/?p=459>)

After making her acquaintance with Grameen Shakti and the Green Tech



Andrew Gold welcomes newest member of NASA's family. Andrew with wife Sharon, son Julian, and daughter Meredith.

Centers in Bangladesh, Greene put together a short film entitled "New Faces of Geeks and Entrepreneurs" (<http://www.youtube.com/watch?v=rKtNDnpM3M>) that aimed to dispel the notion of "geeks" as strictly "men with glasses" and to show the dramatic technological and life altering changes possible at the hands of women in their home communities. Gold met Greene through a mutual friend and was impressed with her keynote speech at the Clean Tech Open. After a series of meetings directed towards rethinking strategies for social and environmental change in third world countries, they formed a partnership with Dipal Barua of Bangladesh to solidify their ideas and to extend the reach of BGE.

As Greene and Gold see their mission, bringing social change and eventual environmental improvements is not about shipping people into these areas to save the day, but about identifying talent and potential within the target communities and empowering them. BGE USA is helping to further refine, franchise and scale the model that Dipal Barua has mastered in Bangladesh and to make it portable and applicable to other developing nations i.e. India, Africa, and Latin America. Andrew envisions the formation of what he calls "Eco Villages," sustainable communities implementing new technology to leverage biogas, grow organic foods, purify water, and develop sustainable local infrastructure within these countries.

The project is now underway as students from Stanford University have begun organizing fundraising strategies and targeting donors. Two Stanford graduate students, Patricia Ho and Clay Sader, will also travel to Bangladesh with Greene and visit the training sites later this summer.

Bright Green Energy USA taps into people's passion for change. Gold and Greene are connecting people abroad with people at NASA Ames, Stanford and Silicon Valley through a shared passion for entrepreneurship, technology and women's empowerment.

Singularity University Welcomes 2010 Graduate Studies Program

by Salim Ismail, Executive Director of Singularity University

On June 19, Singularity University will welcome its second Graduate Studies Program class of 80 student to their summer home at NASA Research Park for an intensive, ten-week program. The program is designed to facilitate understanding and collaboration across a set of rapidly advancing scientific and technological disciplines whose developments are exponentially accelerating.

"The past year of global disruption has resulted in a significant shift in the zeitgeist for exponential technologies," said Salim Ismail, Executive Director of Singularity University. *"Exponential technologies can scale to meet the demands of our grand challenges. Singularity University fosters students' understanding of these accelerating and converging technologies to address humanity's grand challenges."*

Building a World-Class Faculty

Singularity University has attracted leading minds to its faculty, helping to realize its vision of positively addressing humanity's grand challenges. From nanotech expert Ralph Merkle to three-time shuttle astronaut Dan Barry, applicants worldwide are eager to learn and share knowledge with SU faculty, to better understand innovations across the 10 academic tracks.

Beginning with GSP-10, SU is pleased to welcome John Gage of Sun Microsystems/Kleiner Perkins as a Co-Chair of the Networks and Computing Systems track. Credited with coining the phrase "the network is the computer," Gage will lead discussions and workshops, and serve as an advisor to GSP-10 projects.

10^9: Graduate Studies Program Team Projects and Successes

This summer, Graduate Studies Program students will self-organize into teams, tasked with the goal of "positively affecting at least a billion people." Students from last year's summer program made impressive progress toward this goal by leveraging Singularity University's unique resources.

Through Singularity University partnerships, team projects benefit from cutting-edge research of NASA and Silicon Valley. For example, Xidar Systems, focused on applying exponential technologies to disaster response, leveraging knowledge from domain experts, including NASA's Disaster Assistance and Rescue Team.



Singularity University Executive Program participants David Gessel (left) and Robin Winsor (right) working with 3-D fabrication on their class gift in their spare time - a new podium for SU's main classroom at NASA Research Park

Many of last year's projects evolved into companies, now with funding and nearing public launch. *"Based on the early work of the team projects from 2009, and the growing success of the spin-out companies, we expect the effects of our Graduate Studies Program alumni to be far-reaching in affecting humanity's challenges over the coming years,"* said Ismail.



SU and NASA Ames meet during SU's winter Executive Program (L-R) David Morse, Chief, Entrepreneurial Initiatives Division, Innovative Partnerships Program; Susan Fonseca-Klein, Founding Architect, SU; Lewis Braxton, III, Ames Deputy Director; Peter Diamandis, Founder/Chairman, SU; Keith Powers, VP Strategic Development, SU; Chris Boshuizen, Co-Chair Space & Physical Sciences Track, SU

Greater Success through NASA-SU Collaboration

Through Singularity University's collaboration with NASA, students have gained exposure to NASA's innovative research and partnership programs, enabling a unique experience and education.

For example, NASA Ames Research Center Director Dr. Pete Worden discussed new developments with students during Singularity University's Space and Physical Sciences track. A highlight for participants was Dr. Jonathan Trent of NASA's GREEN team, who discussed how cutting-edge biotechnology applies to the grand challenge of clean water. Participants in Singularity University's 9-day Executive Program also received an overview of NASA's long-term goals from scientists across research areas, including Director Gary Martin, New Ventures & Communications Directorate.

Looking Forward

"2009 was a ground-breaking inaugural year for Singularity University," said Ismail. *"The world-class group of students and faculty joining Singularity University continues to exceed our expectations. We expect 2010 to be another great year of innovation, collaboration, and progress."*

<http://www.singularityu.org>

NRP Post

Khalid Al-Ali Appointed Executive Director of UARC

The University of California, Santa Cruz, appointed Khalid Al-Ali as executive director of the University Affiliated Research Center (UARC) on January 25, 2010. He oversees the center's research contract with NASA and special relationship with the NASA Ames Research Center.

Established in 2003 as a contract between NASA and UC managed by UCSC, UARC is a key element of UCSC's presence in Silicon Valley and the campus' growing partnerships with NASA Ames. Research at the center focuses on five technology areas: aerospace systems (which includes air traffic management and rotorcraft research), earth sciences, information sciences, space sciences, and nanotechnology.

Al-Ali oversees 140 scientists, engineers, and administrative staff affiliated with the UARC contract. He succeeds William



Dr. Khalid Al-Ali, Executive Director, UARC

Berry, now president of University Associates - Silicon Valley, a partnership between UCSC and other academic institutions that is developing a sustainable community for education and research at NASA Research Park.

"We are very fortunate that we are able to hire someone of Khalid's experience and expertise. We look forward to Khalid being part of our dynamic relationship

with NASA Ames," said Martin Chemers, vice provost for Silicon Valley Initiatives at UCSC.

Al-Ali has led several major NASA research projects involving advanced aircraft and spacecraft technologies, intelligent avionics, novel power systems, planetary rovers and robots, spacecraft, and autonomous exploratory vehicles for Lunar, Martian, and Antarctic missions. He founded the Carnegie Mellon Innovations Laboratory at NASA Research Park, directing its activities to create advanced technologies for compact, highly capable mobile autonomous vehicles covering ground, air, and space operations. He earned a B.S. in mechanical and aerospace engineering at the University of Colorado, Boulder, and a Ph.D. in mechanical and electrical engineering at UC Berkeley.

NASA 70th Anniversary Gala Event

NRP Partners joined the NASA community in celebrating Ames 70th Anniversary at a gala dinner January 23, 2010, at Santa Clara University. Actress Nichelle Nichols, Lt. Uhura of Star Trek, (she helped NASA widen its recruiting in the early days) gave the keynote. Ames was founded on Dec. 20, 1939, after Charles Lindbergh recommended this location as the ideal spot for America's second research laboratory for aeronautics.



Susan Fonseca-Klein, JD, BA, Co-Founder Singularity University, with Actress Nichelle Nichols



Back Row: (L-R) Paul Pelosi, Jr., Eric Dahlstrom (SU), Lew Braxton, Will Marshall (NASA) Front Row: (L-R) Roger Hunter (NASA), Emeline Paat-Dahlstrom (SU), Bob Richards (SU), Pete Worden, Jack Boyd, Susan Fonseca-Klein (SU), Bruce Klein (SU), Nhu Anh Can (SU), Chris Boshuizen (NASA)



Dr. Khalid Al Ali, UARC Executive Director, with Actress Nichelle Nichols



NRP's Dave and Trish Guerrieri, Gary Air, with Ames Deputy Director Lewis Braxton, III

Tibion Corporation New CEO

Mr. Charles Remsberg joined Tibion in late 2009 after serving for three years as CEO of Hocoma Inc., the U.S. sales and marketing arm of the privately held Swiss company Hocoma AG. Hocoma AG is best known for its clinic-based Lokomat® robotic gait orthosis that has helped thousands of American patients with spinal cord, stroke, traumatic brain injury and cerebral palsy recover their ability to walk.

Prior to that position, Mr. Remsberg was head of worldwide sales for Hocoma, and for more than ten years, an executive of Biodex Medical Systems in Shirley, NY. At Biodex, he rose from product development manager to head of worldwide sales for the nation's leading supplier of balance, gait and joint rehabilitation systems. Mr. Remsberg lives in Palo Alto with his wife and two daughters.



Mr. Charles Remsberg,
Tibion Corporation CEO

Tibion Corporation develops innovative equipment that can help individuals recover physical function lost due to disease, trauma or aging.

The New Science Behind Neurorehabilitation

Approximately 700,000 strokes occur annually in the United States. Half of the 550,000 survivors experience residual hemiparesis and approximately 165,000 of those individuals have mobility deficits requiring assistance with walking. Recent advances in motor-learning-based therapies have opened new possibilities for recovery of motor functions after stroke. Central neural plasticity – the ability of the brain to rewire itself to bypass disease and trauma-compromised regions – has emerged as a prime mechanism that may be exploited to optimize therapy for hemiparesis in the lower limb. At present, the Tibion Bionic Leg is in clinical use at selected sites across the nation. Early reports suggest that patients with hemiparesis due to strokes – even strokes five or more years in the past – responds well to the therapeutic intervention with the Tibion Bionic Leg.

Tibion Corporation, at NRP since 2003, has grown from 200 square feet to more than 5,000 square feet and has entered its marketing and scalability phase.

The Next Big Wave

by Miki Huynh

...Dan Bolfing, like energy guru Amory Lovins, thinks the greatest advances in transportation efficiencies can be attained with lighter weight vehicles and better aerodynamics...

Dan Bolfing knows how to ride a wave of opportunity when he sees one, and create a few of his own. Dan met Timothy Collins, founder of KleenSpeed Technologies Inc., and they formed a partnership for joint ventures between KleenSpeed and Dan's companies, ContactScale and Zystech.

"Dan is riding a composite tsunami," said Collins, noting that Bolfing is known as a preeminent source for composite parts for vehicles in the US and around the world, with a specialty in exotic parts and emergent technology.



Dan Bolfing with a Zystech Machine for prototype design

As a KleenSpeed partner, Dan consults, designs, CAD processes, 3-D renders, and prototypes the electric vehicles KleenSpeed outputs. He builds molds for custom 1-off automotive parts as well as parts in mass production. He also builds CNC hotwire machines that prepare the parts for cutting and drilling.

At his Zystech office in the old auto service station in NASA Research Park, Bolfing surrounds himself with electric car parts and unique prototyping machinery, but his story begins with surfboards. By the age of fifteen, Bolfing understood his passion for surfing. Since boards cost \$250-\$300 each, the high schooler found the sport out of his price range.

cont'd on p.14

NRP Post

Bolfing cont'd from p.13

Instead of buying surfboards, he decided to build his own. Gathering inspiration for dimensions and decorative stenciling from surfing magazines, he shaped boards out of foam inside a home garage. With a little artistry and plenty of resourcefulness, he and a friend discovered they could hand make boards of better quality than the store bought variety, and Bolfing found his calling.

Things took sail when he upgraded to windsurfing at age thirteen, winning third place against the world's best in his first competition by the age of sixteen. It wasn't long until, disgruntled with college, Bolfing left San Francisco State University for Hawaii to seek out the legendary Jimmy Lewis, one of the world's best known windsurf board designers.

Bolfing recalls his first encounter with Lewis: *"I'm hitchhiking up a mountain to get to Jimmy's workshop at the top. A car finally stops, and who is behind the wheel but Jimmy himself."* Since the current board shaper at the shop, Peter Thommen, was abroad competing, Lewis agreed to hire eighteen-year old Bolfing, who was only in his second day of residence in Hawaii, during Thommen's absence. A year later, Lewis invited Dan to work at his surfboard manufacturing company full-time - after Bolfing delayed college a second time, returning once more to Hawaii.

Bolfing gained international recognition in windsurfing competitions and board designs in the ensuing years, while helping the industry push changes in the materials used in windsurf boards, from polyester and clark foam to full vacuumed bags foam construction. In Hawaii, Dan was at the epicenter of the windsurfing world, with his own company, designing boards for brands like Nifty, Cabrinha, Island Comp and Northshore Extreme (and finding time to visit CA and graduate at SFSU.)

After a decade of international success, as machine built boards saturated the market and Japan and Brazil entered an economic recession, the windsurf industry began to freeze. It was time to change course. Dan used his experience and self-built CNC (Computer Numerically Controlled) machines to create a successful sign making business, until a serious fall forced him into long-term rehabilitation.

With plenty of time to think, Dan decided his real passion is cars. With skills in building and modifying prototyping machinery, he planned to prototype movie cars in Los Angeles, but then recognized an epicenter of automotive innovation in the Bay Area, which he compares to the past hotbed for windsurfing in Hawaii.

Bolfing innovates new prototyping processes and new vehicles, and wants to push his fabrication team toward developing lighter weight electric cars for better mileage and overall improved safety. He is even investigating possibilities for constructing organic cars out of materials like paper and honeycomb.

KleenSpeed has exciting new projects on the way, and Dan Bolfing is ready to catch the next big wave. *"Dan's knowledge of composite fabrication technique is profound, and complemented by his ability to integrate software and hardware to design and produce CNC machines. Zystech Machines are cost effective and can enable manufacturers' use of composites in any country,"* Collins said.



Dan at Zystech with his design products, from surfboards to automobiles

Photo: Diane Farrar

CMU Silicon Valley, NASA Ames, USGS, Senseta, and Santa Clara DA's Office Solve 1991 Cold-Case Criminal Investigation

Excerpted from a paper by Corey Ippolito, Ritchie Lee, Yoo-Hsiu Yeh, Khalid Al-Ali, Robert Kayan, John Spritzer, Geoff Phelps

Carnegie Mellon University, NASA Ames Research Center, United States Geological Survey

Carnegie Mellon Innovations Lab (CMIL) in collaboration with the NASA Payload Directed Flight research team from the Intelligent Systems Division at NASA Ames, and the United States Geological Survey in Menlo Park, assisted the County of Santa Clara's District Attorney's Office in CA in solving a 1991 cold case murder investigation. The team deployed a Senseta MAX 5.0A Rover, an autonomous ground vehicle, to perform magnetic surveys of a vacant lot in Alviso, CA, looking for buried material evidence, which included car parts and a possible body buried in the old junk yard. Applied research algorithms developed by NASA and CMU combined with USGS and Senseta technologies provided the means to collect data and locate the buried material evidence, which was excavated. The excavation led to a conviction and resolution of the 18 year old cold-case.

The CSI Case

In 1991, Bernardo Bass killed Dawn Sanchez, but her body and the gun used in the murder was not discovered in the ensuing investigation. Mr. Bass' car, in which Ms. Sanchez was last seen, was also missing. The case was dismissed in 1991 due to lack of evidence. The case was recently reopened, when an informant reported that the car may have been disassembled



USGS personnel carrying the NASA instrumented Senseta MAX rover during Alviso survey

and buried in a large abandoned lot in Alviso. The exact location in the lot was not specified, and the cost to excavate the entire area was too high. Further, the lot contained a substantial amount of buried and surface metallic debris, making a simple survey with metal detectors insufficient.

The DA's office requested surveying expertise from the USGS, who contacted NASA's Payload Directed Flight research

group for support. The NASA group was already working with CMIL and the USGS, and had developed real-time processing algorithms and platforms for magnetic and ground penetrating radar sensors hosted on small autonomous aerial and ground vehicles, for intelligent autonomous earth science missions. Additionally, the NASA group was also already working closely with Senseta Inc., a Carnegie Mellon Silicon Valley spin-off specialised in aerospace technologies and unmanned intelligent systems. In response to the DA's request, the mixed team of scientists and engineers from CMIL, NASA Ames and the USGS deployed an instrumented Senseta MAX 5.0A rover hosting the research technologies under development, and mapped the magnetic environment of the survey area. The USGS received the processed data set, and after further post-processing, presented the county DA's office with their analysis and possible locations for excavation. Based on this data, the county excavated the site and retrieved car parts that matched the suspect's car. Confronted with this evidence in court, on August 29, 2009, the suspect Bernardo Bass pleaded no contest to the charges, was convicted of manslaughter, and sentenced to six years in prison.



Research Engineers Ritchie Lee and Yoo-Hsiu Yeh of the Carnegie Mellon Innovations Lab operating the Ground Station Setup at the Alviso Survey Location.

NRP Post

NRP at Yuri's Night

By Brian Black
Sales Manager, New Business
Planners

NRP partners Planners Collaborative and KleenSpeed Technologies, Inc. hosted popular stops at Yuri's Night on April 10. The day started blustery and cloudy, but by late afternoon rays of sunshine emerged and by evening the wind subsided. The ear plugs went in as the festival atmosphere featuring mega bands grew.

KleenSpeed showed off its prototype electric powered race car with lithium ion battery packs. KleenSpeed's 2009 West WX 10T set the lap record at 92.5mph, winning the four wheel vehicle trophy and First Place overall at "Refuel – the First Alternative Vehicle Demonstration and Electric Time Trials" at Laguna Seca, Monterey, CA, in July 2009.

The Collaborative's interactive six-hole miniature golf course, featuring sustainable products and services, was a huge hit. Thousands putted through the 21stGreen course, learning about NASA Ames' sustainable future with partners such as Magenn, Swinerton Builders, GaryAir, and many others. iPads featuring each of the participants were illuminated at night, fascinating the attendees.

On April 9 Ames hosted Education Day, in conjunction with Yuri's Night, for six thousand students. 2010 Pete Conrad Scholars and Spirit of Innovation Award participants won grants, commercial opportunities and a Zero Gravity flight! Onstage the Collaborative's own Brian Day inspired attendees by giving NASA LCROSS Mission updates, and at 21stGreen, students learned about a sustainable future.



Photo: Diane Farrar



Photo: Daniel Margulies



Photo: Diane Farrar



Conrad Foundations 2010 Spirit of Innovation Awards

by Michael Marlaire



Nancy Conrad welcomes guests with Astronaut Pete Conrad's image on the screen.

Nancy Conrad, widow of Apollo astronaut Pete Conrad - the third man to walk on the Moon and the first to dance on it - created the Conrad Foundation to inspire STEM education. The foundation's second annual Spirit of Innovation Awards for high school students, held April 8-10 at Moffett Field Conference Center in NASA Research Park, was billed as "Revenge of the Nerds meets American Idol."

The program encourages high school students to solve 21st century challenges by creating breakthrough technologies in one of four categories: aerospace, green schools, renewable energy and space nutrition.

Each winning team received a \$5000 cash award from the Conrad Foundation. Ames Center Director Dr. Pete Worden spoke at the event and distributed free Yuri's Night tickets to students and teachers. Former NASA Ames Director for Aeronautics, Dr. Skip Fletcher, representing AIAA, presented \$500 awards to the teachers of the winning teams.

A number of VIPs attended including: Lori Garver, NASA Deputy Administrator; Miles O'Brien, chairman of the NASA Advisory Council for Education and Public Outreach; Steve Westly, The Westly Group; Chairman Jon Wellinghof, Federal Energy Regulatory Commission; recording artist and music producer Pharrell Williams, N.E.R.D.; Keith Cowings, NASA Watch; and entrepreneurs Rafe Furst, John Gage, Fred Nazem and Ari Meisel.

NASA HQ Director for Innovative Partnerships Doug Comstock, Ames New Ventures and Communication Director Gary Martin and NRP Director Michael Marlaire also attended.



Miles O'Brien and Lori Garver discuss NASA and the future with guests.



Nancy Conrad with the People's Choice Winners (AM Rocks) and N.E.R.D. lead singer Pharrell Williams

NRP Post

Happenings at Airship Ventures

by Gus Holweger, Ambassador
Airship Ventures, Inc.

Annual Maintenance

"Eureka", Airship Ventures' Zeppelin, the only US-based airship designed for passenger travel, just completed its annual maintenance as required by the Federal Aviation Administration (FAA).

As you will see from the highlights of this "Annual Physical" the airship, one of only three in the world, is different from a blimp. The maintenance is performed by Airship Ventures' technical staff and by three experts from Germany's Zeppelin company, which built the airship.

Excerpts from the maintenance checklist shows how comprehensive this annual project is. Here are the components:

- Instrumentation
- Engines
- Complete Airframe
- Electrical System
- Pressure Management System
- Fuel System
- Helium Purification

Following are details of two of the tasks that are very specific to an airship:

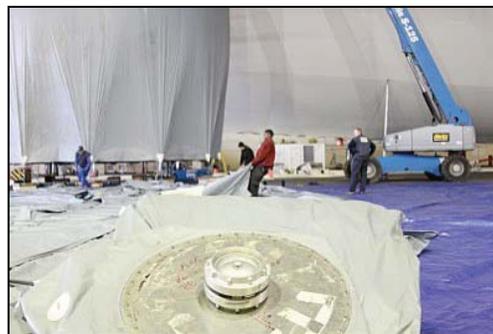
Helium Purification: Other companies using helium have chosen to let the gas escape rather than purify it. Airship Ventures' purification process, that lasts 48 hours, purifies the helium from 75% (with 25% atmospheric impurities) to 98.5%, thus significantly increasing lift for the airship. The process is as follows:

The Eureka is drained of helium and the gas pumped into three large helium storage bags with a capacity of 2,300 cubic meters each (the airship holds a total of 7,400 cubic meters with the residual 500 cubic meters, or 'dregs' being vented as they get atmospheric impurities during the transfer process). Each large storage bag is held in place by 400 lb. concrete blocks on castors.

After the airframe has been completely inspected (this task is described below), the helium, before being pumped from the large storage bags back into the airship, is purified by passing it through membranes. These membranes remove any atmospheric impurities that accumulated during the operation of the airship. The purified helium is pumped back into the airship.



The bags empty from the top, and the helium is pumped into "Eureka", again at the top, where it pools upward, pushing the heavier air out through her ventral ports.



The crew moves the helium storage bag # 3 into position and begins to fold fully deflated bag #2



And then, as the cloud of helium begins to struggle against the heavy bag, we move in the "Abstract Elephant" phase. What a treat!

Airframe Inspection: This task must be done after the helium has been drained from the airship. The technician has to be inside the structure of the airship. For this purpose a temporary 'catwalk' is installed.

The airframe components that will be 100% inspected are:

- "Longerons", the aluminum beams that run from the front to the back of the airship. The longerons are pressure tested up to a maximum pressure of 5 atmospheres
- "Crossbeams", carbon fiber triangles, that are connected to the longerons at regular intervals.
- "Knotplates", the highly engineered and designed connector plates that connect and hold together the longerons and crossbeams.

This structure is vastly different from the airships of yesteryear where huge aluminum structures were held together by millions of rivets. Incidentally, the "ballonets", the two self-contained "air" bags inside the airship used to balance the pressure and lift of the airship, remain inflated while the above tasks are being performed. After these and all other tasks have been completed, an FAA inspector will check the compliance with FAA regulations, accuracy and effectiveness of "Eureka's" Annual Physical and give it its 'seal of approval' - the green light for Airship Ventures to resume its operations for the upcoming seasons.

Decals and Banners – What's the Difference?

This part of Airship Ventures' scope of activities falls under "Branding" and many of you have seen blimps in the air advertising someone's product or service. Branding is one of Airship Ventures' three revenues streams (passenger "flightseeing" and scientific projects being the other two).

How is a decal or banner different from advertising on a billboard?

A billboard, regardless of size, has a flat surface and posters are attached to it with some adhesive. The airship is shaped like a cigar and has curved surfaces. Lettering logos or pictures, in order to avoid distortions, must therefore be designed and produced taking the curvatures of the airship into consideration. Special software is used to design decals and banners for this application. Airship Ventures uses Airborne Graphics software.

Decals: The design is given to a local company that produces the decal made of a self-adhesive vinyl, and, when attached to the airship, accommodates its shape. A decal's life expectancy is about one year. While the decal is self-adhesive and the vinyl weather-resistant, it must be perforated with very small pinholes before being attached. The airship's envelope, while extremely sturdy and multi-layered, still lets helium escape in very small quantities. If the decal is not perforated, the escaping helium might create bubbles underneath.

Banners: For illustrating purposes, a banner might be compared to a big sail made of a material that is not only sturdy, but also moisture resistant (moisture would add weight to the airship which is not desirable). While the same software is used to design a banner as for designing a decal the actual banner may be produced by a company that can meet the material and manufacturing specifications.

The airship envelope has been equipped with banner hooks to tightly affix a banner. There are enough banner hooks to allow for various size banners.



The airship "Eureka" with a Valentine's Day decal

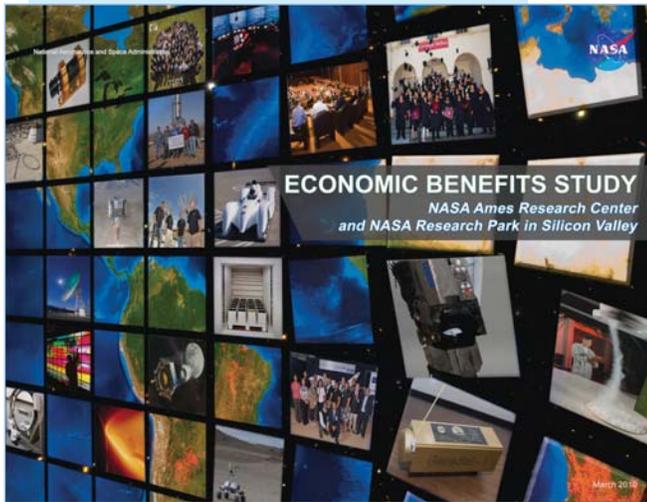
NASA/AV Joint Scientific Projects

In the last edition of NRP Post, we reported about the airship being equipped with a "Remote Sensing Platform" for various scientific projects, one of the first being the Ocean Color Science Mission. These collaborative projects, which also include the SETI Institute in Mountain View, were described in an October 2009 NASA press release.

Alex Travell, Airship Ventures' Special Missions Sales Manager, jointly with NASA Ames staff, is investigating the integration of a standardized "pod" where research staff can install – within bounds – telemetry for a wide variety of experiments and observations in the lower atmosphere. The standardization of the pod is expected to ease physical integration, speed up the paperwork process, and reduce project costs, thus making the Zeppelin more accessible as a science resource for projects that face budgetary constraints.

Airship Ventures' Management and staff wish all NASA / Ames neighbors, colleagues and friends a beautiful Spring 2010 and hope to see you aboard the airship "Eureka".

Economics Benefit Study



NASA Research Park published in March an Economics Benefit Study on NASA Ames Research Center and NASA Research Park highlighting NRP as a NASA and national asset. NRP was recently cited in the National Research Council's report - "Understanding Research, Science and Technology Parks: Global Best Practices." Our NRP community is part of NASA's bold effort to shape the future by improving STEM education, assisting the commercial space economy, advancing next generation information technologies, sensors, robotics, developing new sustainable technologies, and other innovations.

Moffett Field Historical Society Museum Open House

April 16-17, 2010

(L-R) Eugene "Frenchie" Choiniere, Kay Case, R.S. "Red" Brooks, Carol Henderson, Harry "Herb" Parsons. Carol Henderson, whose husband, Lee, was a flight engineer in the Navy, started the Moffett Field Historical Society Museum in 1994 to remember all the military branches that were once based at Moffett.



Photo: Bob Lopez



Photo: Diane Farrar

Visitors view Bell AH-1 Cobra helicopter and F-104 Starfighter, new exhibits on display outside the museum.



Save the date: Ames Child Care Center (ACCC) 14th Annual Charity Golf Tournament, Friday, July 23, 2010 at the Golf Course at Moffett Field. Join us for a great day of golf and fundraising benefiting the Ames Child Care Center! Registration at noon, with shotgun start at 1:00 PM. Your Corporate Sponsored team could be the first ever winner of the ACCC Sippy Cup! Look for more details in an upcoming ARC-NRP-Partners@list.nasa.gov e-mail or contact the ACCC at 650-604-5100 for more information.



Photo: Meighan Haider

Michael Marlaire (center), NRP Director, briefed Mieke Eoyang (left), Rep. Anna Eshoo's Chief of Staff, on NASA Research Park partnerships and development plan in early April. They were joined by Rod Bersamina (right), Field Representative, Office of Rep. Eshoo.

NRP Post

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NRP Post deadlines

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