

NRP Post

A publication of NASA Research Park

Summer 2009



Image courtesy RocketCam

LCROSS launch June 18, seen by RocketCam (aft-facing) on the first stage of the Atlas 5 Rocket

Ecliptic's RocketCam "Shoots the Moon" in LCROSS Mission

by Kathleen Burton

NRP tenant Ecliptic Enterprises Corporation is playing a crucial role in the LCROSS (Lunar Crater Observation and Sensing Satellite) mission to search for the signature of water, a lunar resource that can be used for future human exploration, at the Moon's rugged South Pole.

Ecliptic's signature product, RocketCam™, transmitted video from three camera perspectives of the picture-perfect launch from Cape Canaveral aboard an ATLAS V rocket on June 18. RocketCam™, a family of onboard imaging systems, is designed to withstand the extreme environment of space launches and missions.

Almost five days after launch, LCROSS performed a Moon flyby to insert LCROSS into its Lunar Gravity Assist Lunar Return Orbit (LGLRO). During this maneuver, the LCROSS science payload was activated to provide for calibration data and determine that instruments were correctly pointed. As part of the flyby, lunar surface images, a stunning visual event, was also captured by a RocketCam video camera, one of LCROSS' nine payload sensors.

Besides RocketCam, an Ecliptic-supplied avionics unit, called the Data Handling Unit (the DHU), controls all nine LCROSS visible, infrared and flash imaging sensors, which will relay mission-critical information about the composition of the lunar sub-surface excavated by the Centaur Stage Rocket impact event back to Earth.

Ecliptic continued on page 4

NASA Research Park Hosts Exploration and Sustainability EXPO

by Kathleen Burton

On April 21, 2009, NASA Research Park held its third Technology EXPO, focused on the themes of exploration and sustainability. The event was held in Bldg. 943 and the Exploration Dome from 9 am - 4 pm.

"We are showcasing the technologies resulting from the relationships NRP has built between universities, businesses, non-profits and graduate students in science, technology, engineering and mathematics," said Michael Marlaire, Director NASA Research Park.

"The EXPO is focused this year on the confluence between NASA's exploration-driven technologies and the new technologies needed for sustainability here on Earth," said Marlaire, noting that "the end result will be a cleaner, greener Earth."

Cosponsored by the Ames Innovative Partnerships Program (IPP), the open-to-the-public event attracted over 800 visitors from inside and outside NASA and the Silicon Valley, including business leaders, local politicians, venture capitalists and the media.

The EXPO featured 40+ exhibitors from NRP and Ames in areas ranging from electric power sources for cars to unmanned aerial vehicles used to fight California's recent wildfires. In parallel with the exhibits, 13 speakers gave short presentations

EXPO continued on page 2



Clark Foster, VP Mechanical Engineering, Unimodal Systems, with SkyTran™ exhibit at the NRP Exploration and Sustainability EXPO

University Affiliates, LLC - RFQ Submittals Announcement

by Patricia Ponzini, Assistant Director, UA, LLC

University Associates-Silicon Valley LLC has completed the first phase evaluation of the four developer team responses to its Request for Qualifications issued in June 2009. Following the July 16th meeting of its Board of Governors, UA-SV has selected two finalist teams for the second phase leading to the selection of a development team to form the private element of its public-private partnership to develop a portion of the NASA Research Park as a sustainable community for research and education. The two teams selected to develop business plans for UA-SV consideration are:

- Lowe Enterprises/Essex Property Trust/
Swinerton Builders/Skanska USA Building Inc.
- TMG Partners/The Related Companies

For info contact: Teifion Rice-Evans, Economic and Planning Systems, (510) 841-9190

EXPO continued from front page

in the nearby Exploration Dome on diverse topics such as: "The Moon as a Window on Earth," "Advanced Life Support Systems" and "Supercomputing for Green Technology."

"In NASA's exploration mission, we are developing technologies with Earth-based applications, many having to do with sustainability," said event attendee Doug Comstock, Director of NASA's Innovative Partnership's Program, referencing the work NASA is doing to support the ISS and future lunar and Mars habitats.

"NASA has an opportunity to help the nation move to sustainable systems and renewable energy in the future," said Jeff Smith, Deputy Chief of the Ames Entrepreneurial Initiatives Division. "NASA's research for the ISS and future lunar and Mars habitats will spinoff new green technologies that make our homes and businesses more sustainable here on Earth. Some recent green and environmental spinoffs from Ames include new insulation materials, software for more efficient air traffic management, ground-based sensors to provide environmental data and space-based imaging and analysis for identifying environmental hazards and watering needs for various crops."

Among the EXPO exhibitors were:

Unimodal Systems LLC, developer of the SkyTran™ personal rapid transit (PRT) technology, a hybrid urban transportation model with the privacy and flexibility of an automobile and the throughput of mass transportation;

Kleenspeed Technologies, creating scalable R&D electric power systems for transportation;

NASA ARC Green Aviation Systems, using green aviation systems and researching air traffic management protocols to improve the flying experience, reduce emissions and increase on-time arrivals;

Carnegie Mellon University Innovations Lab (CMIL), developing rovers and mission control systems as prototypes for future Mars rover missions;

UAV Collaborative, a non-profit promoting unmanned aerial vehicles for applications such as acquiring data with Earth Science applications and providing emergency response search and rescue services;

The Lunar Science Institute, a virtual institute with central offices at NASA Ames and member teams worldwide;

Tesla Motors, showcasing the only U.S. certified roadster electric vehicle which operates on lithium batteries, travels 244 miles on a single charge and reaches a top speed of 125 mph;

RMV Technology, providing electro-static discharge (ESD) testing of materials used in space and elsewhere, helping to curb the problem of parts counterfeiting.

Both exhibitors and visitors gave the event an A+. "The NRP EXPO was a great success," said exhibitor Florian Selch of CMU's Innovations Lab. "We had great opportunities to chat with people, promote our research and find new connections."

"We were impressed with the high quality of information and exhibits," said Marianne Adoradio of the NOVA Business Liaison, who said NOVA plans to follow up with several companies who exhibited at the EXPO.

For a complete list of exhibitors and speaker topics and video of EXPO highlights and presentations, please visit the NRP website: researchpark.arc.nasa.gov under "2009 EXPO".

Photozig, an NRP tenant and EXPO exhibitor, has posted a web album of the event at <http://my1.photozig.net/NRP/zindex.php>

NRP and NASA Highlights at Exploration and Sustainability EXPO



EXPO Speakers

- Dr. David Morrison, Director NASA Lunar Science Institute
- Tim Collins, President, KleenSpeed Technologies Inc.
- Christopher Perkins, CEO, Unimodal Systems, LLC
- Steve Hipskind, Chief Earth Science Division, NASA Ames
- William Berry, President, University Associates
- Kern Bhugra, CEO, Tibion Corp.
- Dr. John Hogan, NASA Ames Space Bioengineering
- Dr. Khalid Al-Ali, Director of Research, CMU Innovations Lab (CMIL)
- Dr. Michael Sims, Intelligent Systems Division, NASA Ames
- William Thigpen, Advanced Supercomputing, NASA Ames
- Dr. Eric Becklin, SOFIA Project
- Dr. John Hines, Chief Technologist, Ames Engineering Directorate

Ecliptic continued from front page

“For me the most special moment during the lunar flyby was when our DHU and all the sensors were turned on,” said Ecliptic CEO Rex Ridenoure. “This is the high stakes part for Ecliptic. If our DHU fails, the spacecraft won’t be able to return data,” he said.



Image courtesy RocketCam

RocketCam’s image of the Moon from one frame of live video taken one frame per second June 23 during LCROSS lunar flyby

“All of us at Ecliptic breathed a sigh of relief when the lunar flyby data started streaming back to Earth,” said Ridenoure, who was at home in Pasadena watching the “off-hours” flyby on his laptop. Of Ecliptic’s eight-person staff, four have been directly working on the LCROSS mission on and off for several years.

LCROSS’ goal is to determine the presence or absence of water ice in a permanently shadowed crater at the lunar south pole.

Together with the Lunar Reconnaissance Orbiter (LRO) mission, LCROSS marks the beginning of NASA’s return to the Moon missions.

The LCROSS mission, a collaboration between Ames and Northrop Grumman, demonstrates that fast, small, inexpensive missions are viable options for NASA’s ambitious return to the Moon and Mars.

Next up for Ecliptic and LCROSS is the lunar impact event on October 9 at around 4:30 am PDT. On final approach to the Moon, the inert Centaur stage rocket and the LCROSS shepherding spacecraft will separate. The LCROSS spacecraft will perform a braking maneuver and will reorient to point the instrument payload to capture images and spectra from the Centaur impact event and transmit the data to Earth. During the event, the Centaur will impact the Moon, followed four minutes later by the LCROSS spacecraft.

“When the spent Centaur goes in, you’ll see a quick flash in a completely dark crater,” Ridenoure said. He described what will happen approximately four minutes later: “As the plume of Moon debris from the Centaur impact crater hits the sunlight, the spacecraft will go in, diving through the Centaur impact plume, which will be whizzing by LCROSS (but at a comfortable distance away from LCROSS) in the form a crown.” At that point, LCROSS’ infrared sensors will look thru the debris “and see what it’s made of before everything, including RocketCam, vaporizes.” Earth-based telescope signals will corroborate this impact scenario.

“As before, our avionics will be controlling the whole sensor suite including a lot of data switching and formatting so the spacecraft can relay the data to Earth before the mission ends.” Approximately forty percent of the images taken during approach and impact content will be from Ecliptic’s video camera, he said.

“The last three hours will be full of action, with things changing quickly,” Ridenoure said. “And the last hour will be how the public will remember LCROSS, ...the moon creeping up on the spacecraft and then, the impact. I can’t wait,” said Ridenoure, noting that he “plans to be up all night.”

Ecliptic’s business plan focuses primarily on placing the company’s RocketCam products on rockets and spacecraft going to Earth orbit, the Moon and Mars. The July 15th NASA shuttle launch marks Ecliptic’s 70th launch “with no failures,” said Ridenoure. RocketCam is now on 12 different rocket types, including NASA, commercial and defense customers, and has been launched on five different spacecraft, two in low Earth orbit and two in geosynchronous orbit, with LCROSS the first to the Moon.

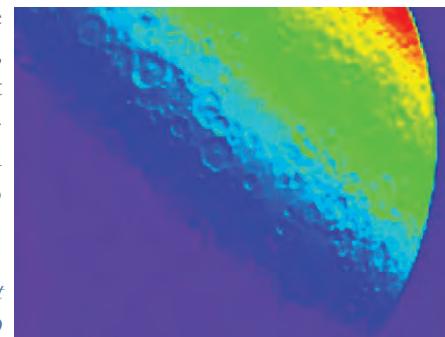


Image courtesy RocketCam

LCROSS is a low cost \$79 million Class D mission that delivered a spacecraft for acceptance in 28 months and is still

Colorized view of the Moon based on an infrared camera’s image, also returned during the flyby

running under cost. It is the first of its kind dual payload aboard the ATLAS V and the collaborative teamwork between NASA Ames, Goddard, Marshall, Kennedy and Northrop Grumman allowed NASA to capitalize on using existing payload capability and keeping costs down. “I am very happy for the LCROSS team, which put together the science payload for less than \$2 million and made it all work. LCROSS sets a new standard for low cost payloads on lunar missions,” Ridenoure said.

Ecliptic’s next NASA lunar mission is the GRAIL gravity measurement mission, run by JPL, and planned for launch in 2011.

Santa Clara University Students Operate PharmaSat

by Diane Farrar with Dr. Chris Kitts



Students operating PharmaSat at SCU's Robotic Systems Lab

The Ames developed PharmaSat spacecraft, launched May 19 from Wallops Flight Facility, carried an advanced laboratory that performed an in situ biological experiment to assess efficacy of antifungal drugs in microgravity.

"NRP Partner Santa Clara University (SCU) students, staff and faculty played an integral role with development of the ground segment - communication stations, mission control, command and telemetry software -- which provided all on-orbit mission operations," said Dr. Chris Kitts, Director, Center for Robotic Exploration and Space Technology at NRP.

"Our team worked around the clock the first week to execute the biology experiment and retrieve the science data for this mission. They are now using the nanosatellite to perform communication link performance testing to improve their ability to support future Ames missions," he said.

The primary ground station is SRI International, Menlo Park, CA, which transmits mission data to Mission Control at NASA Ames. All mission operations were performed by SCU's Robotic Systems Lab, which Kitts directs.

SCU's PharmaSat operational support follows their operation of the Ames GeneSat-1 satellite, launched in 2006.

"GeneSat-1 still operates as part of an SCU class in spacecraft operations. SCU is also preparing to provide mission operations for the Ames O/OREOS spacecraft, which is currently manifested for a launch in early 2010," Kitts offered.



Tracking Stations for PharmaSat

KleenSpeed/Thruxar Electric Race Car Wins 1st Overall at Laguna Seca Alternative Vehicle Time Trials

July 21, 2009 – Monterey and Mountain View, CA



Clockwise from top left: Tim Collins, President, KleenSpeed; Andrew Gillis, driver with trophy, COO KleenSpeed; Morgan Gillis, VP Production, KleenSpeed; Paul Gillis, Gillis Motorsports

NRP's KleenSpeed Technologies, Inc., a designer of electric power systems and components for high-performance cars and other vehicles, announced July 21 that its electric sports racer, powered by the KleenSpeed "Thruxar" electric power system, recorded the fastest lap of the day at "Refuel - the First Alternative Vehicle Demonstration and Electric Time Trials."

KleenSpeed's 2009 West WX 10T Thruxar electric race car won the overall competition and the four wheel vehicle trophy with a lap time of 1:43, or an average speed of 90 mph. KleenSpeed has converted three race cars to electric power, and this was the first race track appearance for its 2009 West WX 10T sports racer which utilizes the KleenSpeed "Thruxar" power system. The car was recently converted to electric power by KleenSpeed's joint venture partner, Gillis MotorSports.

Refuel was held at Mazda Raceway Laguna Seca in Monterey, CA July 19, 2009 and featured a wide array of electric and other alternative energy vehicles including motorcycles, go-karts, Tesla motorcars, race cars, sports cars, solar powered cars, home-builts and conversions. The event, organized and sponsored by Speed Ventures, introduced the cutting-edge performance, speed and torque of electric vehicles on a world famous race track.

According to Timothy Collins, KleenSpeed Chairman, "The promise of high-performance electric power has arrived, with our KleenSpeed/Thruxar machine capably driven by Andrew Gillis turning a 1:43 lap time. This was not only the fastest time at Refuel, but we believe this is the electric vehicle record at Laguna Seca. Having clearly demonstrated performance, we are also finalizing technical enhancements to realize a half-hour range. We look forward to delivering top-performance electric cars to the racing circuit, and to bringing those state-of-the-art technologies to a range of other consumer and industrial vehicles."

For more info: <http://kleenspeed.com/> and <http://www.refuelraces.com/>, <http://gillismotorsports.net>, <http://www.speedventures.com>

Civilization in a Box

by Diane Farrar

NASA Research Park based Green Trail Energy Inc., in collaboration with International Network Solutions, Global Wireless Communications and North Star Fabrication, has manufactured the first clean energy based mobile telecommunication system (data/cellular). The system is denoted GSW7000 as it produces 7kW of clean energy using solar and wind power.



The 2.4kW wind turbine, 4.6kW sun tracking solar system and heavy-duty 106 ft. telescoping tower fold into a package the size of a standard sea container for economic shipping worldwide. "It is a bit like something in a Steven Spielberg movie, it folds into a very tight package yet has a large

Andrew Gold's Green Trail Energy's GSW7000, the first renewable power and wireless communication tower on a mobile platform

and stable footprint when deployed. It can be deployed by one person, producing power and transmitting in less than 30 minutes as it is highly automated by hydraulic subsystems," said Green Trail President Andrew Gold. Extra onboard power can easily be utilized to provide other basic necessities, i.e. light, water purification, irrigation, etc. "It's civilization in a box," says Tim Collins, president of Kleenspeed.

The patent pending 106 ft. tower system and folding communications array can support any flavor of wireless equipment including WiMAX, UMTS, LTE, CDMA, GSM and/or Wi-Fi. Green Trail used concepts similar to satellite manufacturers, with folding solar arrays that can move and rotate to track the sun, maximizing output. The system is delivered with 1500Ah's of battery storage, making the system fully self sustainable and redundant. Green Trail is considering all methods of energy storage for future models.

"We can power a mobile communications system, backhaul it using a satellite uplink, and transmit terrestrially using only wind and sun," said Gold. Green Trail Energy believes this system could revolutionize energy and communication system deployments in developing nations. The system can provide clean power and sustainable communication efficiently to remote areas for long-term use and is perfect for disaster response.

International Network Solutions (I-Net) specializes in building sustainable broadband networks that provide free broadband access to major metropolitan areas. I-Net operates and maintains Google's free broadband network in Mountain View, CA and collaborates with Silicon Valley Unwired in operating a free broadband network in Milpitas CA. I-Net deploys WiMAX for municipalities and carriers throughout the United States.

For info contact Andrew Gold: agold@intnetworksolutions.com

The Other Kind of Green (it's about the money)

by Diane Farrar

Timothy Collins, President and Chairman of KleenSpeed Technologies, Inc., invited Washington D.C. consultants to NRP July 8 to discuss government grants and loans available for sustainable projects.

The financial consultants from BlueInk Capital Partners specialize in navigating the beltway maze in search of stimulus dollars, grants and loans, and have been engaged by Collins to help NRP companies procure available R&D and production



L-R: Bill Shraga and Eric White, BlueInk Capital Partners; Tim Collins, KleenSpeed President; Dan Bolting, Zystech; Andrew Gillis, Kleenspeed COO; Andrew Gold, Green Trail Energy

funds from appropriate government agencies, as well as public and private concerns. Collins' goal is to bring in about \$10 million in production funding. KleenSpeed also plans to form a \$12 million research and development consortium which will be funded by several companies desiring to get access through licensing of alternative energy and electric vehicle products developed by the consortium.

Eric White, BlueInk Senior Managing Director, San Francisco, CA, gained experience in Washington, DC, with the Clinton administration, was an early fundraiser for President Obama, and has been active in private

KleenSpeed continued on page 7

KleenSpeed continued from page 6

capital mergers and acquisitions. "In Washington, it's not what you do, it's who you are working with that brings the money," White said.

"Traditional channels of funding have dried up...looking for government dollars now is the only way to go," said William Shraga, a former Bear Stearns Investment Banker with expertise in numerous technology disciplines. Shraga is BlueInk Managing Director in Santa Monica, CA.

Andrew Gold, President of International Network Solutions, Inc., GreenTrail Energy, Inc. and eta Tech, Inc.; and Dan Bolfing, a new KleenSpeed partner, were invited by Collins to discuss their technology development with BlueInk. Gold and Bolfing, both serial entrepreneurs, have each launched successful start ups.

Bolfing, Founder and CEO of Zystech, invented a relatively light-weight smart machine to design and cut composites. Bolfing makes the carbon fiber parts for the KleenSpeed power systems. He, like energy guru Amory Lovins, thinks the greatest advances in transportation efficiencies can be attained with lighter weight (composites) vehicles and vehicle parts, and improved aerodynamics. Bolfing's machine can scan, digitize and make 3-D shapes, which he thinks will excite the new generation accustomed to virtual reality. A former World Cup windsurfer, Bolfing made the machine to be competitive in his sport. His machine's cost is well under the current cost of \$1 million plus for traditional computerized milling machines on the market. Its lighter weight allows cheaper transport and a smaller footprint.

KleenSpeed - Does it Move You?

A 1999 SWIFT ChampCar (CART), last raced by Robby Gordon in 2000, arrived at KleenSpeed in early July to aid R & D efforts. Folks may remember seeing this car perform in California venues like the Long Beach Grand Prix or San Jose Gran Prix, to name a few.

Thanks to Andrew Butte, a local rescue helicopter pilot and race car enthusiast, the car is now on loan to KleenSpeed to help with R&D efforts that will lead to high performance electric drive conversion systems.

"We are designing a Thruxar electric power system for Butte's car which, when scaled back, will be suitable for super-cars like Ferraris, and trucks and buses -- the greatest fuel consumers. Our goal is to make the former CART Indy car as fast as it was with its internal combustion engine," said KleenSpeed President Timothy Collins.



Photo by Eric James

L-R: Tim Collins, President, KleenSpeed and Andrew Butte, rescue helicopter pilot and former Army Aviator, with Butte's 1999 SWIFT ChampCar

Butte, a former Army Aviator (note the car's original Army Sponsorship) has deployed numerous times to Afghanistan and Iraq, piloting combat rescue helicopters. He had purchased the racecar just prior to the collapse of the ChampCar Series, when he read in a local paper about KleenSpeed's arrival at NASA Research Park.

Butte, after decades of military service, is now likely in the final year of his Air Force career. "After 22 years of flying, I soon will no longer participate in the critical life saving missions that are an all encompassing part of my life. After much introspection, I believe that I can have a far greater impact on society by focusing on technologies that enable geo-political stability," Butte said.

Butte is a licensed race car driver, and like Collins, shares a passion for motor sports and technology. Both Tim and Andrew believe that the competitive, innovative spirit in motor sports will bring the biggest gains to the automotive industry and consumers. Collins, a former pilot, and Butte are thinking about Thruxar power systems for aviation.

"Whatever we've seen so far is not the solution to our energy problems, but if smart people like KleenSpeed and NASA keep working at it, we will get there," Butte said.

KleenSpeed is developing Thruxar systems - electric motors, battery packs and controllers for electric vehicles of various scale.

m2mi Helps Reboot Computing with the Magic and Beauty of Computer Science



Leading computer scientists meet at the Computer History Museum in Mountain View, CA, to boost K-12 computer science education

Innovation powerhouse and NRP partner, Machine-To-Machine Intelligence Corporation's (m2mi) CEO Geoff Brown was selected as a lead designer for the altruistic industry effort to encourage adoption of computer science for K-12 education. This year 200 of the world's top leading computer scientists attended an invitation only closed door three day meeting at the Computer History Museum to literally "reboot" the entire computer science education system and encourage more US students to study computer science.

"Since the age of eight, computing has defined my life. Working alongside the pioneers of the computer science industry to help student education and increase US adoption is a challenge I relish, and it starts with an open and level playing field" said Geoff Brown.

More info on rebooting computing: www.rebootingcomputing.org



City of Mountain View Councilmembers and city staff visit NRP Director Michael Marlaire. L-R: NRP Director Michael Marlaire, Kevin Woodhouse, Ligia Sarmiento, Vice Mayor Ronit Bryant, Councilmember Mike Kasperzak, Councilmember John Inks, and Ellis Berns

LCROSS Spacecraft to Search for Water on the Moon

by Dr. Michael J. Redmon, Program Manager, ISRDS, SGT, Inc.

For mankind's initial efforts to establish permanent outposts off our home planet to succeed, we must develop technologies to utilize in situ resources to produce essential substances to sustain life, produce energy and build habitats. Nothing is more critical than the ability to produce water and oxygen. Prior observations of the moon's polar regions suggest that water ice may be present in craters at the lunar poles. The Lunar Crater Observation and Sensing Satellite (LCROSS), the first mission in NASA's Vision for Space Exploration -- a return to the moon and beyond, is designed to provide definitive evidence of the presence of water ice on the moon.

On June 18 NASA launched an Atlas V Rocket from the Cape to determine if water ice is present in polar lunar craters. The Lunar Reconnaissance Orbiter (LRO), the primary payload managed by Goddard Space Flight Center, is now in a lunar orbit identifying safe landing sites, searching for resources and investigating the radiation environment.

LCROSS, the secondary payload managed by NASA Ames, will stay with the spent Centaur upper stage during several Earth orbits, until just before a planned impact into a permanently shadowed crater on the south polar region, planned for October 9. The spacecraft, outfitted with imagers, spectrometers and a photometer, will guide the Centaur into a precision impact and follow at a safe distance, recording and relaying data from the tons of ejecta caused by the Centaur impact, before itself impacting inside the crater. Ground and space-based observations will also collect data from both impacts. Instruments will analyze the impact plumes for water (ice or vapor), hydrocarbons and hydrated minerals.

NRP tenant SGT, Inc. supports LRO and LCROSS. Engineers and computer scientists with SGT's Intelligent Systems Research and Development Support (ISRDS) contract provide flight operations and ground systems support for LCROSS at Ames. Paul Tompkins of SGT serves as Lead Flight Director. Khanh Trinh and Masoud Mansouri-Samani provide additional support to LCROSS simulators and system verification and validation.

Paul, a northern CA native, received a B.S. in Aeronautics and Astronautics from MIT, an M.S. in Mechanical Engineering from Stanford, and a Ph.D. in Robotics from Carnegie Mellon University (specializing in mission-directed planning and scheduling for planetary rover exploration). An expert in satellite and spacecraft systems engineering, he spent several

LCROSS continued on back page

California Space Authority Unveils Plans to Support Lunar Rover Development

by Matt Everingham, Engineering Programs and Development Manager, California Space Authority

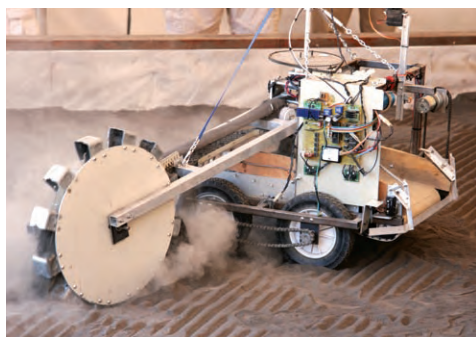


The Cal Poly San Luis Obispo team sets up their rover during the 2008 Regolith Excavation Challenge

The California Space Authority (CSA) has signed an agreement with NASA Ames Research Center to collaborate on participatory science and public outreach using a simulated lunar surface environment. Under the terms of a Space Act Agreement, California Space Authority is establishing a lunar regolith simulant testbed in Bldg. 503 in NASA Research Park. The testbed will have a footprint large enough to test rover capabilities such as lunar surface mobility, excavation, resiliency to the dusty lunar surface environment and the abrasive properties of the lunar regolith simulant. It is anticipated that universities, NASA researchers and others will be able to use this testbed to augment their lunar system development efforts as an easily accessible “field test” site. It is envisioned that the testbed will eventually support the development of private missions to the lunar surface by providing an opportunity for enhanced risk reduction and mission planning.

This fall, NASA Ames and CSA, along with its sister organization, the California Space Education and Workforce Institute, will be using the testbed to host the Regolith Excavation Challenge, a prize competition focused on developing improved lunar regolith handling technologies. During the Regolith Challenge scheduled Oct. 17-18, 2009, teams from across the country will design and build robotic machines to excavate simulated lunar soil, otherwise known as regolith, in hopes of winning a \$750,000 prize funded by the NASA Centennial Challenges program. CSA is a nonprofit organization supporting California's commercial, civil and national security space stakeholders. For info on CSA: www.californiaspaceauthority.org For info on the Regolith Excavation Challenge: www.regolith.csewi.org

Team Waldbaum's rover digs in at the 2008 Regolith Excavation Challenge



Team Waldbaum's rover digs in at the 2008 Regolith Excavation Challenge

Team Waldbaum's rover digs in at the 2008 Regolith Excavation Challenge

NewSpace 2009 Conference at NRP

by Bruce Pittman, Space Portal

On the 40th Anniversary of the Apollo 11 Moon landing a new generation of space explorers met at NASA Research Park to talk about the future. The NewSpace 2009 conference was coordinated by Dr. Jeff Smith, Deputy Chief Entrepreneurial Initiatives Division, and sponsored by Boeing, The Heinlein Trust, the National Space Society and the Space Frontier Foundation.

The conference mixed the practical and the revolutionary, bringing together students at the start of their careers with seasoned veterans ready for new challenges.

“We in the Space Frontier Foundation were delighted to hold our 20th anniversary NewSpace 2009 conference at NASA Research Park. Many of the participating NewSpace companies are already working with NASA Ames, and hope to grow their technical collaborations using NRP’s ‘friendly front door’. We were thrilled to have over 300 attendees and look forward to returning next year,” said James Muncy, Co-Founder, Space Frontier Foundation and space policy consultant in Washington, D.C.

Each of the three conference days had a theme. The first day “Enabling the Future” began with a welcome by Lewis Braxton III, Ames Deputy Director, and included three panels highlighting Ames programs. The first featured Ames’ small missions, with Dr. John Hines presenting PharmaSat, Dr. Dan Andrews covering LCROSS and Cecilia Wigley describing her groups’ experience integrating small payloads into the Space Shuttle and International Space Station. The second covered Ames commercial space efforts with Dr. Dan Rasky, Director, Space Portal, discussing his work with SpaceX on their thermal protection system, Dr. John Hogan talking about advanced life support systems and Dr. Yvonne Cagle describing the Human Suborbital Science Program.

The final session, Public/Private Partnerships led by Gary Martin, Director, New Ventures and Communications, featured NASA’s Innovative Partnership Program and Small Business Innovative Research programs, and Jeff Smith presenting Ames Green Initiative. Michael Marlaire, Director, NASA Research Park, concluded with a fascinating description of the role the NRP could play in developing the NewSpace economy. “In four years I hope the efforts to establish a new economy in space becomes synonymous with NASA Research Park,” Marlaire said. According to Marlaire, NRP development plans and the fifty-eight NRP partners from industry, universities, and institutes could provide the “physical nexus” for the acceleration of the new space economy and NRP partner Space Portal could become NASA’s “friendly front door” to the entrepreneurial space organizations, facilitating their involvement with NASA.

NewSpace continued on page 13

Carnegie Mellon Names Martin L. Griss to Head Innovative Silicon Valley Campus

by Chriss Swaney, CIT Media Relations Director

Carnegie Mellon University's Martin L. Griss has been named director of Carnegie Mellon University's Silicon Valley campus, effective July 1. He succeeds James Morris, founding director of Carnegie Mellon Silicon Valley and former dean of Carnegie Mellon's School of Computer Science.

Carnegie Mellon Provost and Senior Vice President Mark S. Kamlet praised Griss for his vision and broad expertise in software engineering technology.



Martin L. Griss, Director, Carnegie Mellon Silicon Valley

"It is a great honor for me to be named to this important post as the demand for faster, leaner and more mobile information technology and systems continues to grow," said Griss, currently associate dean of research at Carnegie Mellon Silicon Valley and codirector of Carnegie Mellon CyLab's Mobility Research Center. "As director of Carnegie Mellon Silicon Valley, I will continue to work with my university colleagues to improve our educational programs and perform innovative research that connects

us to important global technology companies."

Pradeep K. Khosla, founding director of Carnegie Mellon CyLab and dean of Carnegie Mellon's College of Engineering, said Griss' background, his extensive research and education experience, and his global skills in developing programs for software reuse make him a perfect choice to lead Carnegie Mellon Silicon Valley.

With nearly 40 years of academic and industrial research experience, Griss is world-renowned for his work in software reuse and software agents, which is now focused on context-aware, mobile companions for the globetrotting professional and the "SmartSpaces" sensor-enabled environment for home-based, elder-care projects. He spent two decades as a principal

laboratory scientist at Hewlett-Packard, and as director of HP's 70-person Software Technology Laboratory. He was previously an associate professor of computer science at the University of Utah and an adjunct professor at the University of Southern California, Santa Cruz.

The South African native received his bachelor's degree in math and physics from the Israel Institute of Technology in 1967, and a Ph.D. in physics from the University of Illinois in 1971. Griss and his wife Pnina, a retired biologist, live in Mountain View, Calif. They have two children, Doron, 30, and Shelli, 27. Both work in the competitive software entertainment technology industry.

Carnegie Mellon Silicon Valley, established in 2002 at Moffett Field, offers full-time and part-time master's degree programs in software engineering, software management, networking, security and mobility, and engineering and technology innovation management. Last fall, the campus launched an associated bi-coastal electrical and computer engineering Ph.D. program focused on mobility, security and networking. This August Carnegie Mellon Silicon Valley awards its 400th degree.

Second Age of Carnegie Mellon in Silicon Valley

by Richard Power, CyLab Distinguished Fellow

The history of Silicon Valley is one of daring, luck, and ceaseless endeavor.

It is a narrative rife with the thrills and chills of boom and bust. For every icon that has emerged to illuminate the digital sky, there are countless wrecks that did not make it, as well as other story lines that end abruptly when some entity or another is devoured by some larger, hungrier entity. There are also many fascinating sub-plots interwoven throughout the timeline, and one of them just took a fascinating twist.

Under an azure blue sky, in an open air tent, speaking to an audience of hundreds of Bay Area alumni, trustees, donors, parents and students, Dr. Jared L. Cohon, President of Carnegie Mellon, declared that having "soldiered on" through challenging economic conditions in the Valley since its founding in 2002, "in a way we are looking at the second age of Carnegie Mellon in Silicon Valley."

CMU continued on page 11

CMU continued from page 10

Held at the Carnegie Mellon Silicon Valley campus, on the grounds of NASA Research Park (a.k.a. Moffett Field) in Mountain View, California, the event was part of “Inspire Innovation – The Campaign for Carnegie Mellon University.”

Following Dr. Cohon to the podium, Pradeep Khosla, Dean of the College of Engineering and founder of Carnegie Mellon CyLab, elaborated on the “re-visioning” of the Silicon Valley Campus, as “the crown jewel for the College of Engineering.”



Pradeep Khosla, Dean of the College of Engineering and Founder of CyLab, addresses the audience

Emphasizing the work of recently established CyLab Mobility Research Center (MRC), Dean Khosla extolled the virtues of the bi-coastal program which calls for students to spend two semesters in Pittsburgh and two semesters in Silicon Valley.

“Don’t get me wrong, Pittsburgh also has a culture of innovation and entrepreneurship, but there is something about this air out here, once you start breathing it you don’t want a real job anymore, you want to be an entrepreneur,” Khosla remarked wryly, “You want to use somebody else’s money to create something, and maybe it becomes something big, or maybe you lose it. But as we know, more often than not it has become something big.”

Khosla also cited the significant investment made in the building of a state of the art distance education class room. “And we are building two more,” he added.

After the opening remarks of Cohon, Khosla and Martin Griss, Director of the CyLab Mobility Research Center, Associate Dean in the College of Engineering and recently named Director of Carnegie Mellon Silicon Valley, the crowd of hundreds broke up into smaller groups to rotate through four brief presentations meant to convey the scope and spirit of the work being undertaken at Carnegie Mellon Silicon Valley:

Jason Lohn, a Senior Research Scientist at the Silicon Valley campus, spoke on “Space and Beyond: Creating the Next Generation Antenna through Evolutionary Computing.”

Khalid Al-Ali, Director of Research and the Carnegie Mellon Innovation Lab, spoke on “Carnegie Mellon Innovation Lab: An Overview of Cutting-Edge Research in Ground, Air and Space Technologies.”

Ray Bareiss, Director of Educational Programs and Professor of Practice of Software Engineering and Software Management, spoke on “Transformative Professional Education for Silicon Valley.”

Griss, along with two more faculty members, spoke on “Mobility: Enhancing Our Lives through Mobile Technology.” Afterwards, attendees were shuttled to the Computer History Museum for “An Evening of Impact and Imagination.”

Carnegie Mellon Silicon Valley is dedicated to educating its students to become leaders in global technology innovation and management and to performing innovative research that connects it to local, national, and global high-tech companies. Long known for its leadership in engineering and computer science research and education, Carnegie Mellon and the College of Engineering have established a natural extension in the Silicon Valley, one that integrates the rich heritage and resources of the Pittsburgh campus with the opportunities available in the highly innovative and entrepreneurial Silicon Valley. Offering graduate programs in software engineering, software management, information technology, innovation and mobility, each program provides the appropriate mix of technical, business and organizational skills critical to our students' success. With research that focuses on a suite of new technologies, Carnegie Mellon Silicon Valley is committed to creating and implementing solutions for real problems.

For more information, visit: <http://sv.cmu.edu> or contact Sylvia Leong, director of external relations and admissions, at sylvia.leong@sv.cmu.edu.



Students and guests mingle on front lawn of Carnegie Mellon Silicon Valley

2009 NSTI Summer Scholars and Faculty Fellows

United Negro College Fund Special Programs Corporation

(UNCFSP) is pleased to welcome this year's participants in the NASA Science and Technology Institute for Minority Institutions (NSTI) Project. The NSTI brings together the talent and expertise of Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), Tribal Colleges and Universities (TCUs) and Other Minority Institutions (OMIs), to provide the opportunity for all Minority Institutions (MIs)

to communicate, connect, and collaborate with government, the private sector, one another, and other majority institutions and research and

technical associations and organizations through the establishment of R&D collaborations and partnerships. The Summer Faculty Fellowship (SFF) and the Summer Scholars Programs (SSP) provide hands-on research experiences at NASA centers, as well as positive experiences for grant writing and career advancement.

MI Faculty are readily sought to obtain great research experiences at the NASA Centers. The benefits are vast, yet specific to the individual's research interest. Thus, the NSTI project is excited to have early career, STEM faculty from MIs at NASA Ames this summer. They will take part in ground-breaking research activities and then incorporate the knowledge gained through their NASA experience into the curriculum upon return to their home institution. The goals of the SFF are to:

- Enhance the technical capabilities and prepare MI faculty to apply for other NASA Pipeline opportunities
- Provide an opportunity to share information about specific MI capabilities and technologies
- Enhance undergraduate and graduate research

The 2009 NSTI Summer Faculty Fellows are Dr. Gregory Battle (Grambling State University), Dr. Eranna Guruvadoo (Bethune Cookman College), Dr. Carmen Lilley (Univ. of Illinois-Chicago), Dr. Nicholas Madamopoulos (The City Uni-

versity of New York), Dr. Edgardo Oliveros (Univ. of Puerto Rico –Baymon Campus), Dr. Ehsan Sheybani (Virginia State University), and Dr. Lakew Temeselew (Trinity University)



2009 NSTI Summer Scholars, Faculty Fellows and Mentors
 Front L-R: Brandon Douglas, Michael Tucker. Middle L-R: Gilena Monroe, Carmen Lilley, Patricia Cowings, Charlese Hawkins, Adrienne Haynes, Sonya Greene, Jenaelle Coleman, Edgardo Oliveros, Errana Guruvadoo. Back L-R: Ray Gilstrap, Lakew Temeselew, Eshan Sheybani, Nicholas Madamopoulos, Gregory Battle

The SSP component of the NSTI project provides a dynamic atmosphere for undergraduate and graduate students in science, technology, engineering and mathematics (STEM) fields to participate in cutting edge research. NASA scientists and engineers serve as mentors to the scholars who spend 10 weeks engaged in a wide variety of research themes including nanotechnology, flight assessment, sleep deprivation, and computing. Additionally, scholars receive opportunities to enhance their scientific

communication and leadership skills through various professional development workshops and trainings throughout the summer. Initially based solely at the NASA Ames Research Center, the Summer Scholars component expanded this year to include scholar placement at NASA Johnson Space Center (JSC) and NASA Glenn Research Center (GRC).

Mr. Roger Riviere, a former NSTI Summer Scholar from 2008, addressed the incoming 2009 scholars during the NSTI Orientation Meeting that was held Friday, June 5th. Mr. Riviere talked highly about his experience and offered great words of wisdom. "The NSTI program offers you the chance to walk away with a future," he told the incoming program participants. "Take advantage of it. I sure did." He also displayed the poster he created for last year's poster session where he competed with all of the 100+ summer interns to earn an impressive fifth place award for best poster presentation. Since participating in the NSTI program, he secured employment with NASA and will graduate this year with his bachelor's degree in Electrical Engineering.

The Summer Scholar and Faculty Fellow projects feed into a third component of the NSTI program, called the NSTI Research Clusters. In view of the substantial contributions that underrepresented minorities make, the research cluster teams provide the means and opportunity for engaging the minority higher education community in government and private industry research. Thus, the NSTI research clusters facilitate research collaborations amongst MIs, NASA, other government agencies and private STEM organizations.

Scholars continued on page 13

Scholars continued from page 12

Each cluster specializes in research disciplines that help to make the Vision for Space Exploration a reality and promote the advancement of space exploration. To date, three research clusters have been established.

- The UNCFSP-NSTI Information and Emerging Technologies Cluster (UNITE) conducts research that address pressing challenges in the areas of Supercomputing, Networking and Intelligent Systems. The NASA Ames Research Center is home to UNITE.
- The UNCFSP-NSTI Mission Enabling Technologies Cluster (UNIMET) conducts human exploration mission enabling research in the areas of Science Missions and Payloads, Bio-technology, Astrobiology, Human Factors, Advanced Life Support and Bio-nano-info fusion. The NASA Johnson Research Center serves as the host center for UNIMET.
- The UNCFSP-NSTI Energy and Environmental Cluster (UNEEC) addresses energy and environmental issues as it relates to space travel and life on earth. UNEEC is housed at the NASA Glenn Research Center.

UNCFSP serves as the managing partner for the NSTI Project. Founded in April 2000, UNCFSP is an all-inclusive advocate and resource for the minority higher education community—Historically Black Colleges and Universities (HBCUs), Hispanic-Serving Institutions (HSIs), Tribal Colleges and Universities (TCUs), and Other Minority Institutions (OMIs)—both domestically and internationally. Through workforce development, training, and capacity-building programs and services, UNCFSP fosters educational excellence and professional advancement to ensure our constituencies' competitiveness.

For more information about UNCFSP and the NSTI project, log on to www.uncfsp.org/nsti.

NewSpace continued from page 9

The afternoon sessions focused on technologies that could enable the NewSpace economy - nanosats, orbiting fuel depots, suborbital point-to-point transportation systems and space solar power systems. Each technology could leverage growth for the new economy and also represents cost and risks to be addressed. The afternoon's featured speaker, Dr. David Livingston, host of The Space Show, presented "Humanity's Future in Space."

The second day featured The Business of New Space and began with a business plan competition. The plans ran the gamut from small satellites to novel propulsion schemes to lunar exploration. Flightsuit LLC, the maker of an innovative spacesuit glove design, took home the \$5,000 prize from the America Heinlein Prize Trust, which sponsored the competition. A number of policy and business issues that affect NewSpace were discussed, as well as the role of government in this new economy and whether it is having a positive or a negative effect. Also explored were lunar commercialization opportunities to provide services to NASA in support of lunar exploration program.

The final day theme was "Apollo 11 Anniversary: Moon, Mars and Beyond". The first panel members were associated with the Lunar X Prize sponsored by Google -- a \$30 million prize for a robotic return to the moon. Three of the nineteen teams signed up for the Prize were present and presented their teams and plans. The seven finalists for the "Teachers in Space" competition sponsored by the Space Frontier Foundation were honored at a special luncheon ceremony. The winner of this competition will receive a free sub orbital vehicle trip and will share this experience with their students. The later panels addressed diverse topics such as the threat and promise of Near Earth Objects, the proper architecture for exploring the moon and beyond, the science of settling the solar system, and the next steps -- where do we go from here?

The conference takeaway message is that commercial space has the potential to protect the earth, create wealth, open up the solar system for commerce and make us a truly spacefaring civilization. This remarkable event in a unique setting has everyone wondering what next year's event will bring.

Photo by Michael Marfai



Far left: James Muncy, Co-Founder, Space Frontier Foundation and Washington, D.C space policy consultant

AV's Zeppelin NT - Multi-tasking at its Best!

by Gus Holweger, Community Ambassador,
Airship Ventures, Inc.

Our Spring issue focused on “Increased Co-Operation between NASA Ames and Airship Ventures.” We at Airship Ventures like to think that in addition to ‘cooperating’ we have become neighbors and part of NASA Research Park’s growing community of high-tech and academic tenants.

Airship Ventures has extended its “Neighborhood – Same Day – Flight Special” program through the end of 2009. All federal employees, Ames interns and contractors, NRP partners, and military personnel are eligible. These ‘Same Day Flight Specials’ may be booked no earlier than 24 hours before scheduled flight time. Sixty and ninety-minute flights for those eligible are offered at \$199 plus tax. AV Guest Services will do the booking. Call (650) 969-8100 ext. 111 for details.

Airship Ventures’ airship the ‘Eureka’ underwent its FAA- mandated annual maintenance in March and has since offered its unique ‘flightseeing’ for individuals, charters, and special interest groups out of Moffett Field, Oakland, and as of late Monterey. The ‘Eureka’ also soared twice over Long Beach, to celebrate the release of Pixar’s popular movie “UP” and again for the July 4th festivities. Offered in connection with the Monterey and Long Beach flights (which will be continued as the season progresses) are one-way flights from Moffett field to the destination or from the destination back to Moffett Field.



'Eureka's' first decal was Pixar™'s "UP"

Special terms have become the trademark of technology and business. What used to be ‘Advertising’ has now become “Branding” and what used to be “Billboards” are in Airship Ventures vernacular “Decals”. The ‘Eureka’s’ first decal was Pixar™’s “UP” lettering and the wonderful depiction of the main character’s house being airlifted by hundreds of colorful balloons to its new home far away.

The second decal, currently on the ‘Eureka’, is “23and Me.com Personal Genetics.” It invites interested parties and individuals to access the company’s website to see their genes in a whole new light. 23andMe won TIME Magazine’s 2008 (Biotech) Invention of the Year. Their website explains how it works, suggests setting up an account and ordering a 23andMe kit.



The second decal currently on the ‘Eureka’ is “23and Me.com Personal Genetics”

For those of you who want to know details about attaching decals to the airship – it takes special layouts for the dimensions of the decals as they are attached to a curved surface (as distinguished from the flat surface of a billboard) and can therefore not be distorted.

Decals also add weight to the ‘Eureka’. This adds another challenge to balancing our ‘lighter-than-air’ dirigible. For example, the “UP” decal for the Pixar™ movie took four days to affix and 3 days to take off, and added 39 kilogram of weight. The “23and Me” decal took six man-days to put on and take off, and added 34.4 kg weight.

Airship Ventures has more to report:

On the events side, Airship Ventures wants you to know that it soared over the recent ‘Pacific Coast Dream Machine’ event in Half-Moon Bay and the “Concours d’Elegance” in Palo Alto, followed by flights to the San Francisco and Monterey Concours d’Elegance, and flights on special holidays (like the 4th of July journey to Long Beach).

Airship Ventures provided for another US ‘FIRST’ in “lighter-than-air” Zeppelin flights on the July 4th trip to Long Beach. Geoff Reeves, former member of the US Navy Seals and member of the Navy “Leap Frogs” parachute team jumped with a para-sail parachute onto a roped-off target in front of the ‘Queen Mary’ in Long Beach.

Airship Ventures just completed our second “pilot experience” course

Led by our experienced pilots and engineering team, this two day adventure allowed individuals to see behind the scenes at

AV continued on page 15

AV continued from page 14

Airship Ventures, learn the basics of airship flight, and get into the cockpit. They handled the controls, commanded the airship, and did it all from the left seat.

Each session was limited to six “qualifying pilots” (class enrollment required that individuals must be pilot rated private pilots or better and have a current FAA medical certificate.) The session gave each pilot at least 30 minutes in the cockpit and nearly four hours of total flight time in the Zeppelin. Flying time was preceded by a comprehensive and interactive ground school covering flight and ground operations, limitations and performance, as well as system checks, ground handling and preflight procedures. For further information to the web at www.airshipventures.com/tours-pilot_experience.php

While we spend a great deal of time doing passenger flights, the airship also lends itself to scientific projects thanks to its stable flight characteristics, its vectored thrust engines that enable it to take off and land vertically and to hover over selected targets at low altitudes, and its slow cruising speeds. We have been working with NASA on a Space Act agreement to jointly explore this unique aviation platform and determine what types of projects are best suited to the airship. Special Mission Manager, Alex Travell, has been pulling together the technical information in an “Experimenters Handbook” for those who want to pursue scientific applications. Alex, who has more than 20 years experience with airships all over the world, including a recent mission to use an airship to take detectors to the North Pole, can be reached at atravell@airshipventures.com. We expect to be flying our first detectors in a test mode during August and a special missions section of the website will go live around that time too!



Geoff Reeves, former US Navy Seal, jumping off the “Eureka”

Airship Ventures offers opportunities for fun, excitement, the experience of unequalled “Flight-seeing”, and scientific exploration. If you have never done it, give a flight on our ‘Eureka’ some serious consideration.

Singularity University Panel on Humanity’s Grand Challenges

by Diane Farrar

On July 9 Singularity University (SU) hosted its second public event -- Humanity’s Grand Challenges -- in its nine week graduate summer program at NASA Research Park. SU’s panel of experts addressed a packed house on global issues of climate change, pandemics, water resources, vulnerable populations, poverty and the economy.

The host, Mr. Vijay Valtheeswaran, a writer for the Economist, opened the evening at the Moffett Field Conference Center reflecting on Gandhi’s question: “How many planets will it take?”

“African vegetation has been cut down for energy, the African population now relies mostly on the consumption of bush meat. The increased contact between human and animal brings greater opportunities for virus transmission across species. Will we be ready? Indonesia faced a pandemic but chose not to share the strain because they believed the vaccine would not be made available to them once produced by an industrial nation. Although pandemics are a great threat, climate change is the first priority because of its impact on water. Most water is used for agriculture, and much is lost through evaporation. Water is everything.”

-- Dr. Larry Brilliant, Skoll Foundation

“We avoided Paul Ehrlich’s prediction of reaching 20 billion people on the planet this decade, but at almost seven billion, we consume like 20 billion, and our carbon footprint is as if we are 20 billion. Unfortunately those causing climate change are not the ones impacted by climate change. It is really too late, we need infrastructure change immediately. We should now implement adaptive approaches like early warnings and flood control in vulnerable areas.”

-- Dr. Chris Field, U.S. Rep to the International Panel on Climate Change (IPCC), and coauthor with Al Gore of the Nobel Prize winning IPCC report

“One billion people in the world do not have access to water. 2.6 billion are without proper sanitation. We have failed to provide this basic need. Globally we have polluted rivers, rivers that don’t reach their destinations, and water tables drying up in the southwest. We need to implement many soft path solutions. In Colorado it is illegal to harvest rain water because the Colorado River is so oversubscribed. Until recently it was illegal for me to use gray water to water my own garden and plants.”

-- Ms. Meena Palaniappan, Water Initiative, Pacific Institute

“I deal with projections. We cannot even predict if rainfall will decrease or increase over the tropics. Two billion people in Asia depend on water from glacier melt. These glaciers are now reduced by 80%. Kenya now has many villages powered by solar. There is no grid in Kenya, and the population sees renewables as superior.”

-- Dr. Bill Collins, Climate Science Dept., Lawrence Berkeley National Laboratory

SU Panel continued on back page

The World's Best and Brightest are Here -- International Space University and Singularity University Sessions Underway

by Diane Farrar

On June 29 the Mayors of Mountain View and Sunnyvale, NASA and ISU officials, and the Governor of California, (via video) welcomed 132 students from 35 countries to the International Space University's (ISU) 2009 Space Studies Program at NASA Research Park (NRP). Also welcomed heartily were 40 international and American students attending the inaugural session of Singularity University (SU), now a permanent resident in NRP. More than 100 international distinguished professors and staff also arrived for the first ISU session hosted at a federal site.

The opening ceremony, under the leadership of NRP Partners and ISU Cosponsors Joy Colucci, SGT, Inc, and Jessica Culler, Planners Collaborative, was held at the Mountain View Center for Performing Arts. Planners Collaborative built a new exhibit at the Exploration Center and designed the ISU/SU logos and banners for main street Mountain View and NRP's Parade Ground. Planners also erected an NRP "line of questions" exhibit and directed the welcoming and hospitality tasks with talented student teams from San Jose State University's Hotel, Recreation and Tourism Management Department.

NRP Partners Dr. Pascal Lee, Mars Institute; Rich Davies, Western Disaster Center; and Dr. Khalid Al Ali, CMU-SV, are included as ISU academic staff along with numerous NASA Ames scientists. Upon arrival ISU students talked with NASA's Expedition 20 astronauts aboard the International Space



Station in a live downlink June 30 to learn more about Canada's first long-duration astronaut, Bob Thirsk, the payload design process and a student experiment which is currently onboard the station.

The idealistic, motivated crowd of the world's best and brightest attended workshops such as spacecraft design, space law, geopolitics of commercial launches, remote sensing, neuroscience, and robotics. A NASA astronaut and Russian expert instructed them in orbital science. Ames lead scientist Dr. Chris McKay gave a crash course in astrobiology. Students and staff experienced microgravity in Zero G's aircraft and questioned expert panels on Commercial Space, Mars Exploration and the "living in space experiences" of international astronauts.

"This has been a memorable summer and Ames and NRP have much to be proud of. 172 students from 36 countries are engaged in rigorous interdisciplinary, international and intercultural studies – nearly one-fifth of the world's countries have citizens at NASA Ames this summer," said Donald James, ISU/SU Project Manager.

The students are now focusing on their team projects: Mars Caves – the Role of Subsurface Habitats in Mars Exploration; Disaster Risk Management; and Space Aid for Energy Needs on Earth.

ISU was founded in 1987 with the vision of a peaceful and prosperous future through the study, exploration and development of space for the benefit of humanity. The space studies program is a nine-week course for postgraduate students and young professionals from all over the world. The curriculum covers technical and non-technical, space-related fields and ranges from engineering and satellite applications to policy and the humanities. The ISU and SU programs end August 28th.



NRP Deputy Director Report from ISU HQ

by Trish Morrissey, Deputy Director NRP

This summer International Space University (ISU) has come to the NASA Research Park with 132 students for their nine-week Space Studies Program. "International" is a key descriptor for this school, 2009's class represents 35 countries. Every year



Photo by Michael Marlaire

L-R: Donald James, ISU/SU Project Manager; Trish Morrissey, Deputy Director, NRP; Ruth Marlaire, Public Affairs; Mike Mewhinney, News Chief, Public Affairs

the University goes to a new site, in a different country, to offer their master's level program focusing on all aspects of the space business, from the rocket science to the public policy. A lot of planning

and effort go into ramping up this course as it has to reinvent itself each year in a new location.

In order to aid in the logistics and communication between NASA in California and ISU in Strasbourg, France, I went to ISU for four months in early 2009 on a detail assignment. My project was to help with the final logistics but also to work with the President of ISU on other projects and to gain experience in an international environment.

During my detail I learned a lot about the international space community and ISU's educational objectives. My projects ranged from performing a gap analysis regarding ISU's readiness to pursue additional academic recognition outside of France, where ISU currently is recognized by the Ministry of Education, to recruiting and coordinating team project leads and professional visits for the summer curriculum. My gap analysis supported ISU's core strategy as it is continuously looking to maintain international character while addressing and mitigating the difficulty of having to explain one country's method of validating academic legitimacy to potential students from another. Indeed, prior to leaving Strasbourg ISU began initial accreditation discussions in the United States.

The 9-week intensive Space Studies Program is only one of many courses offered by ISU in interdisciplinary education in an intercultural environment. At the Strasbourg campus year-long masters programs are offered in both Space Science and

Space Management, and professional development courses and symposiums bring key players in the space field to ISU all year round. This year for the first time ISU is offering an Executive MBA. This 18-month program is designed for working professionals and takes place in 2-week blocks in various locations around the world. I was lucky enough to help critique the inaugural session of the program as one of my last assignments prior to leaving Strasbourg.

While at the University I was able to participate in many of the international activities organized at ISU including the international space symposium on the theme Space for a Safe and Secure World and in addition to my support to the new Executive MBA classes, I gave a lecture on NASA to the Executive Space Course participants. When added to the regular interaction with ISU's masters degree students and with the regular flow of international visitors through the building, I acquired substantial experience in working and interacting with people of over forty different nationalities.

While ISU will only be in the NRP for nine weeks, their impact will hopefully be much more lasting. Certainly my experience at ISU was pivotal in my appreciation for the importance as well as the complexities of international collaboration. I expect that like myself, the NRP and NASA will see lingering benefits through the connections made with the ISU students and faculty as a result of interactions as mentors, in professional visits, social events and public panels. In the competitive yet highly collaborative space business these experiences are invaluable.

Blue Agaves Planted by Bldg. 19

by Kathleen Burton

Four "blue" agaves have been recently planted on the East side of Bldg. 19 off the back parking lot. Agaves, which are related to the lily and amaryllis families, are low water, low maintenance plants native to Mexico and the American Southwest. Known as "Century plants", these slow growers produce a tall (up to 12 foot) flower stalk after many years and then die after blooming.



Photo by Kathleen Burton

However, the original plant has produced offsets, (called "pups") which continue live on. The two small agaves are *Agave Parryi*, which is used to make tequila. Dried agave flower stalks can be used to make didgeridoos, medicinal herbs, teas and tinctures.

Hands On with Electrostatic Discharge -- ESD and Tribocharge Measurements at NASA's Science Technology Showcase are for Kids, Too

"The June 29, 2009 event was very worthwhile!" said Bob Vermillion, of NRP's RMV Technology Group, LLC. "When RMV received the invitation to display at the NASA Science & Technology Showcase in Mountain View, we jumped on it right away as a means of getting the message out about static electricity problems to the general public, namely future astronauts and engineers - kids!"

"To my surprise, said Renee Mitchell of RMV, "Bob had all kinds of experiments geared towards kids for generating static electricity. He even set up the same instruments used in satellite high bay areas and university seminars. It seemed to work, as an overwhelming number of future scientists and astronauts were attracted to our booth."



RMV's Bob Vermillion explains ESD to young guest at NASA's Science and Technology Showcase

Photo by Renee Mitchell

"I was amazed that the youngest kids were able to grasp concepts about static electricity and ESD because they could participate in the experiments and see what was happening," said Bob.

Vermillion explained how static electricity related issues are harmful to electronics in spacecraft, space suits and potential specimen sampling on Lunar or Mars due to Electrostatic Attraction (ESA), a concept the kids readily embraced.

According to NASA JPL, ESD issues are a big problem and increasing -- as devices get smaller ESD sensitivities increase. The aerospace sector is seeing ESD sensitive devices being compromised at <50 volts and the roadmap is now at +/25 volts as the maximum allowable voltage seen on a device. In like fashion, microprocessor densification is sacrificing protection for real estate, Vermillion explained.

"With computer interfaced instrumentation in hand and visual aides, Bob was able to bring static electricity to life. Our booth was flooded with kids from age 4 to teenagers who were captivated by the experiments of Tribocharge Generation (charging by friction), Field Inducing ESD events and attraction issues," said Renee.

For the next NASA event, Bob will expand his array of experiments and equipment to accommodate more kids' quest for science. According to a surprised Renee Mitchell of RMV, several parents had asked if Bob would set up experiments at their schools.

For info contact: renee@esdrmv.com

Transportation Leaders Discuss Unimodal Personal Rapid Transit for NRP

by Michael Marlaire



On August 4th the NRP hosted a meeting of local, regional and state transportation officials to discuss the potential for a personal rapid transit (PRT) system at NASA Research Park. NRP partner Unimodal briefed guests in Building 14 on their PRT system, SkyTran™, and demonstrated a to-scale transit pod that seats three people descending from a maglev guideway. Following the tour Ames Center Director Pete Worden welcomed guests to lunch in the Ames Committee Room to discuss NRP's unique potential opportunity for a PRT system.

Attendees included Bijan Sartipi, District Director Caltrans; Steve Heminger, Executive Director Metropolitan Transportation Commission; Dennis Manning, Fresno County Transportation; Dr. Russ Hancock, President and CEO Joint Venture Silicon Valley Network; Jon Kessler, District Director, California Assemblyman; Paul Fong, Doug Schmitt and Jeral Poskey, Google; Peter Skinner, Transportation Director Silicon Valley Leadership Group; and Ellis Berns, City of Mountain View Economic Development.

"It was an outstanding meeting that I believe hwnwas generated major interest in the Skytran PRT system," said Unimodal CEO, Chris Perkins. Expectations are high, as new Caltrans Director Randell Iwasaki is expected to visit Unimodal later this month.

For Unimodal info: <http://www.unimodal.com/> or watch CEO Perkins presentation from the Exploration and Sustainability Expo on the researchpark.arc.nasa.gov website.

Lunar Science Forum at NRP

The Lunar Science Forum 2009, organized by NASA's Lunar Science Institute in NRP, reported on recent science results from current lunar missions and discussed future opportunities for lunar science. The July 21-23 Forum had ~650 attendees from 31 states with international guests from 15 different countries, including delegates from current international lunar missions Kaguya from the Japan Aerospace Exploration Agency (JAXA), Chandrayaan-1 of the Indian Space Research Organisation (ISRO), and Chang'e-1 from China's National Space Administration (CNSA). Representatives from NASA's lunar missions were also in attendance, with Richard Vondrak discussing the preliminary science results of the Lunar Reconnaissance Orbiter (LRO) mission, and Principal Investigator Tony Colaprete detailing the upcoming LCROSS impact.



Singularity University booth at Ames hosted Moonfest held July 19 in NRP to honor Apollo 11's 40th Anniversary

SU Panel continued from page 15

"We have the solutions to climate change. We don't have the solution to poverty, which is caused by the problem of human greed. Upfront infrastructure funding is the problem. We have a program now in Berkeley that provides infrastructure funding for renewable energy installations, and the owners pay back via property taxes. This is working."

– Dr. Dan Kammen, Berkeley Institute of the Environment, IPCC

Host Valtheeswaran closed the session asking the tough question "Should water be a commodity?" What do you think?

LCROSS continued from page 8

years with Hughes Aircraft Company as a mission systems engineer for their commercial satellite operations. Paul is committed to the research, development and flight test of intelligent systems for space exploration.

For further information on LCROSS, see the mission site at (<http://lcross.arc.nasa.gov>) or Paul's Flight Director's Blog at (<http://blogs.nasa.gov/cm/blog/lcrossfdblog>).



Ames Research Center Director Pete Worden (l) hosts San Jose Mayor Chuck Reed's (r) visit to NASA Research Park in August

Honors for reQall, Inc

NRP partner reQall, Inc. won the "Tie 50" award in the wireless category and is listed in New York Times' top 10 iPhone applications for 2009.

KleenSpeed Board Announcement

Timothy Collins, Chairman of KleenSpeed Technologies Inc. announced May 14th the appointment of Susan R. Crossley to the Board of Directors. Ms. Crossley is a writer and former Semiconductor Technology Financial Analyst. Ms. Crossley joins Peter Sprague and Timothy Collins on the Board. Peter Sprague (sprague.com) is the former Chairman of National Semiconductor Corp for 30 years (NSM), former owner of Aston Martin Lagonda Ltd. and founder of Wave Systems Corp. (WAVX).

Timothy Collins, the Chairman is the founder of KleenSpeed and a Managing Director of Security Research & Associates, Inc. (sracap.com) Mr. Collins was also appointed President to fill the position left by Jerry Kroll, co founder of KleenSpeed who resigned from the Board and as President to pursue other opportunities. Andrew Gillis with JV partner Gillis Motor Sports serves as COO and Jerry Chan serves as CFO.

KleenSpeed Technologies Inc. founded in November of 2007 is developing technology, products and systems for the EV or Electric Vehicle industry. KleenSpeed uses racing cars which have been converted to total electric power utilizing KleenSpeed systems as a laboratory and test bench to develop and test products. KleenSpeed has established an Advisory Board and forged joint ventures with other firms dedicated to alternative energy solutions and implementation.

NRP Post

Editor Diane Farrar
Layout and Design Christine Nolasco

NRP Post deadlines

Please submit articles to Diane.Farrar-1@nasa.gov on or before, October 30, 2009 for the next issue.

Phone: (650) 604-2NRP

Email: arc-dl-researchpark@mail.nasa.gov

Website: www.researchpark.arc.nasa.gov