



NASA Ames

education

To advance high quality STEM education
using NASA'S unique capabilities

Ames Education and Public Outreach

Torrential Rain Fails to Dampen Birth of a University

- by Jonas Dino



Dignitaries meet before the Birth of a University Celebration, left to right: Ames Director of Safety and Mission Assurance, Michel Liu; Ames Center Director, S. Pete Worden; Navajo Technical University President, Elmer Guy; President of the Navajo Nation, Ben Shelly. NASA photo by Eric James.

In literature, rain is sometimes used as a metaphor for renewal but when it comes down in a deluge, producing a two-foot wall of water running through the middle of campus; it means something different altogether when planning an outdoor event. What it meant to the Navajo Technical University and NASA team was adapt and overcome!

NASA Space Day with the Traveling Space Museum was held on Sept. 18, 2013 in Crown Point, New Mexico to help celebrate the "Birth of a University." The three-day event was held to commemorate the renaming of Navajo Technical College to Navajo Technical University (NTU). The new name underlines the institution's expanded technical programs and educational scope. NTU is the first university in the Navajo Nation.

When the planning began for the event, the main concerns were: the logistics of transporting the Space Day activities, training the volunteers to run the activities, and high temperatures. Planning for rain was the least of the team's concerns. A few days

before the Space Day, the concern shifted to dealing with the affects of the area's worst torrential rain storm in decades. When the NASA education team arrived, proceeding with the event was in doubt: much of the campus was flooded or covered in a thick layer of mud.

Undeterred, everyone shifted into overdrive. The NASA team worked closely with the Navajo Technical University team to quickly relocate the opening ceremonies and Space Day activities. The team faced one complication after another: the school's only forklift was not working due to a missing battery and the wrong size tent was delivered. But when the first busloads of students arrived, everything was ready to go and the team felt like they'd pulled off a minor miracle.

The celebration began with a traditional Navajo Invocation and welcoming comments by NTU president, Guy Elmer. Navajo Nation President, Ben Shelly spoke about the importance of celebrating Navajo culture and the potential of the Navajo

inside

- NASA Harriett G. Jenkins Pre-doctoral Fellow (JFPF) Wins First Place Award P2
- NASA Ames Impacts Thousands at Bay Area Science Festival P3
- NASA Smart Skies Receives Award P3
- SLSTP Summer Program Trains Next Generation of Scientists P4
- NASA Continues Commitment to Diversity in the Next Generation of STEM Leaders P4

people. Ames Center Director, Dr. S. Pete Worden added his poignant thoughts, applauding NTU and highlighting the benefits of a strong partnership between NASA and the Navajo Nation, and a video greeting by NASA's Associate Administrator for Education, Leland Melvin, emphasized the significance of the partnership.

During the ceremony, Dr. Worden presented Presidents Shelly and Guy with framed images of the
(continued on page 2)



Water inundates the middle of the NTU campus. "The water started coming in through the windows. Water was coming from everywhere and it got quite high," Jacqueline Waggoner, NTU Nursing Director. Photo by Joshua Toddy, NTU.



Dominique receives a NASA rover drivers license for her outstanding rover navigation skills. Photo/created by Jonas Dino.

"That looks like my back yard," remarked, with enthusiastic laughter, several members of the local high school who came to see President Shelly but stayed to participate in different activities. They were looking at a 3-D panoramic mural of Mars.

"I think we started to break her shyness," said Gwen Chischilly speaking of her nine-year old daughter, Dominique. "Thanks to NASA Ames Research Center for coming to share with us. I've got a future space cadet on my hands."

Dominique took charge of the rover driving station, making sure the station ran smoothly. She demonstrated how to operate the rovers and made sure that everyone had a turn driving. She fixed the network connection between the iPads and the rover when it dropped and fixed the rover tracks when they slipped off of their wheels. For doing such a great job with the station, she was presented with a 'NASA Rover Driver's License'.

"I know that this event changed his ideas and inspired his thoughts of NASA," said Tammy Bitsilly, NTU E-Learning Coordinator, about the impact on

her son. "He was so excited about space and science. He went back to school telling his classmates that he rode a jet, drove a moon rover and wore a space-man suit."

"Still today, he talks about his friends from NASA. Thank you for coming to the Nation and touching the hearts and minds of growing children," she added.

The NTU volunteers, a few who were interns at Ames during the summer, also enjoyed the event. You could feel the pride they took in not only facilitating a station but also sharing their stories of success as NTU students. They were role models, helping to inspire the Nation's next generation.

Through the event, NASA touched the lives of hundreds of people who may have not otherwise had the opportunity to visit a NASA facility or attend a NASA event. It was a positive experience for all who participated in the event, from the ones who traveled 3-hours one-way to the ones who walked from the local high school to the NTU students who facilitated the activity stations.

The old adage, 'what doesn't kill you makes you stronger' is true. The logistics nightmares of this event

created stronger ties between NASA Ames and the Navajo Technical University; ties that centered on providing students an experience emphasizing education and space. Mother Nature made the Navajo Technical University, NASA Ames and Traveling Space Museum team jump through a bunch of hoops but the students participating never knew about it. That is how it should be! ■

(continued from front page)

SOFIA (Stratospheric Observatory for Infrared Astronomy) aircraft from its successful mission to New Zealand. Two Navajo Nation high school teachers flew on that mission as SOFIA Infrared Astronomy Ambassadors. In an unusual coincidence, in his speech, President Shelly spoke of seeing a striking double rainbow as he drove up to the university. He saw it as a sign of the bridge that was being forged between NASA and the Navajo people. In the framed image, a rainbow beautifully framed SOFIA.

After the opening ceremonies, the students began filtering out to the different hands-on or interactive stations. The stations included: a space toilet; hovercraft; space suits and lunar rover activity; remote control rovers; F-117 flight and orbital training simulators; an index card bridge challenge; and atmospheric pressure and conservation of angular momentum demonstrations.

From all accounts, the event was a great success. This was very evident in the comments and facial expressions of the participants.



NTU volunteer challenges students to build a bridge that can hold at least the weight of two rolls of pennies using a 4x6 inch index card. Photo by Daniel Vandever.



Innocent Udom, 1st Place Best Poster Award during the 64th International Astronautical Congress (IAC) held Sept. 23-27, 2013 in Beijing, China.

NASA Harriett G. Jenkins Pre-doctoral Fellow (JFPF) Wins First Place Award at the 2013 IAC Conference

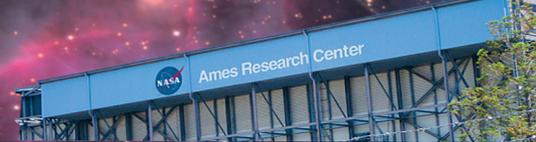
- by Maria Lopez

Innocent Udom, a doctoral candidate in the Department of Chemical and Biomedical Engineering at the University of South Florida, received the 1st Place Best Poster Award during the 64th International Astronautical Congress (IAC) held Sept. 23-27, 2013 in Beijing, China. The IAC, which is organized by the International Astronautical

Federation (IAF), the International Academy of Astronautics (IAA) and the International Institute of Space Law (IISL), is the largest space-related conference world-wide and selects an average of 1,000 scientific papers every year. Udom, a JFPF Cohort 10 Fellow, received full travel sponsorship from NASA for both an oral talk and poster presentation. Travel grant recipients were selected by a NASA technical panel of scientists and/or officials based upon the relevance of student abstracts to the space agency's mission. The Agency's international

education activities are an on-going effort to bridge NASA sponsored interns and fellows with students from around the world, and the international astronautical space community.

Udom's presentation was entitled, "Photocatalytic Processing of Organic Waste for Green Space Exploration." This NASA research was conducted at the University of South Florida, and with Senior Scientist Aloysius Hepp at NASA Glenn Research Center. The JFPF Program is managed by the Office of Education at NASA Ames. ■



NASA Ames Impacts Thousands at Bay Area Science Festival

- by Brenden Sanborn

For the past few years the NASA Ames Office of Education has been working closely with groups that support the NASA goal of helping build a STEM (Science, Technology, Engineering, Math) proficient public. One such organization is the Bay Area Science Festival (BASF). This NSF-funded organization has been implementing various STEM engagement events throughout the Bay Area for the past three years.

BASF events range from TED talks to Educator Professional Development workshops to design challenges and even facility tours of the Bay Area's premier research labs. Whereas these events are often extremely popular and well attended, they are dwarfed by the sheer scope of the culminating end-of-summer events. These major opportunities, called Discovery Days, are on such a large scale that in San Francisco they take over the Giants Stadium at AT&T Park! This year the event drew so many that it was near its maximum capacity of 30,000 persons!

A quick glance at the activities being offered explains why so many flock to Discovery Days. Many and various science, technology and engineering entities from the Bay Area engage and challenge the public's interest in STEM. Among the offerings, participants were encouraged to build rockets,

experiment with endothermic reactions, engineer a lander for a Mars rover, determine genes and extract and model DNA.

Exhibitors included Stanford University, Lawrence Livermore National Laboratory, The Tech Museum of Innovation, Google, Genentech, and NASA Ames Research Center. Ames had four large exhibit spaces located in the heart of the action on the promenade: SOFIA, Microbes, Earth Science, and Education. The activities included Mars Rover Entry-Descent-Landing Challenge, 3D Panoramic Mars-scape, Mars Science Lab components, microbial mat investigation, and infrared energy demonstration. These activities ran constantly at maximum capacity. The real stars of the show, however, were the authentic interactions that went on throughout the day between the attendees and Ames researchers and engineers. Past years BASF data (as well as NSF research) shows that the most inspiring and transformative experience is providing the public



Ames education interns challenge Bay Area Science Festival attendees to test their engineering skills and design a lander that can safely deliver a rover. Photos by Brenden Sanborn.

the opportunity to engage with STEM experts in an open-learning environment. NASA Ames was enthusiastic in answering this call and personally impacted many thousands.

Having completed the third year of the informal collaboration, NASA Ames and BASF are looking into the possibilities of further expanding this fruitful collaboration. Through this relationship, Ames is able to better achieve many of NASA's education, communication, and outreach goals. Whether it was talking to scientists, doing design challenges, or learning about NASA missions - one thing is certain: the public thirst for science is growing and Ames is more than happy to work to ignite that passion through all that we do. ■

NASA Smart Skies Receives Mervin Strickler Award

- by Rebecca Green

The National Coalition for Aviation and Space Education's Dr. Mervin K. Strickler Aerospace Education Leadership Award has been presented to the NASA Smart Skies Education Program for outstanding achievement in the field of aerospace education.

Smart Skies team members Gregory Condon, Miriam Landesman, William Preston and Rebecca Green were selected as recipients of the award and were presented with the award at the National Aeronautics Association's annual Fall Awards Banquet on Nov. 12, 2013, in Arlington, Va. Smart Skies is an Aeronautics Research Mission Directorate funded middle school math project that connects distance-rate-time mathematics to the real-world career of air traffic control through fun, hands-on simulation. Used in classrooms nationwide since 2004, Smart Skies has stayed current with learning technology trends and continues to be an effective resource for teachers.

In order to expand its use in schools across the nation, the Smart Skies team has been collaborating

with an array of organizations including the Federal Aviation Administration, National Air & Space Museum Udvar-Hazy Center, the Hiller Aviation Museum, Evergreen Museum, Pearl Harbor Aviation Museum and Cradle of Aviation, Department of Education, and West Ed Silicon Valley Education Foundation. Furthermore, for the past eight years, the Smart Skies project has been presenting a lecture as part of a graduate-level educational technology course at California State University East Bay. Smart Skies "FlyBy Math" proved so effective that it was featured as the cover article of the Mathematics Teaching in the Middle School Journal of the National Council of Teachers of Mathematics.

To date, the Smart Skies teacher website has received more than 100,000 unique visits, the Smart Skies air traffic control simulator website has received more than a quarter-of-a-million visits and the Sector 33 app has been downloaded more than 140,000 times, and the FAA

Aviation Education Outreach Program, using Smart Skies, has reached more than 24,000 teachers and more than 78,000 students. The Smart Skies Team alone has directly trained more than 3,000 educators.

For more information regarding NASA Smart Skies visit: <http://smartskies.nasa.gov/> ■



NASA Smart Skies Team receives the 2013 Strickler Award at the National Aeronautics Association's Fall banquet. From left to right: Bill Preston, Bay Systems Inc. (A); Rebecca Green, The Collaborative (VE); Judy Rice, President, National Coalition for Aviation & Space Education; Miriam Landesman, The Collaborative (VE); Gregory Condon, The Collaborative (VE). Photo provided by National Aeronautics Association.

Space Life Science Training Program Prepares the Next Generation of Scientists and Engineers

- by Kristina Gibbs



Photo by Dominic Hart.

For 10 weeks this past summer, six undergraduate students participated in the Space Life Science Training Program at NASA Ames. The primary goal of the program is to train the next generation of scientists and engineers, enabling NASA to meet future research and development challenges in the space life sciences.

These students worked on three life science projects within the Bioengineering Branch (SCB) of the Space Biosciences Division. Those projects focused on research on *Drosophila*, human centrifuge and the Lunar Plants Project. In addition to gaining experience in research and project management, the summer's students were encouraged to submit abstracts to the American Society of Gravitational and Space Research. All the projects were accepted and the students recently attended the

conference and shared their research with the membership.

The undergraduate students attending this summer's program appear in this photo as follows: back row, left to right: Peter Hatch, San Jose State University; Margareth Cheng-Campbell, University of California-Davis; Tony Briceno, Mitchell Community College; and Patricia Randazzo, College of Idaho (staffer). Front row, left to right: Josh Chen, Carnegie Mellon University; Morgan Carlile, Washington University in St. Louis; and Caleb Canas, Harvard College.

Mentors for the students were Sharmila Bhattacharya (SCR), William Wade (Dynamac), Daniel Morgan (SCF), Fritz Moore (Lockheed Martin), Jon C. Rask (Dynamac), Arwen Dave (Lockheed Martin), and Robert Bowman (Lockheed Martin). ■

NASA Continues Commitment to Diversity in the Next Generation of STEM Leaders

- by Maria Lopez

Across the Agency, teams of education specialists tirelessly work to find and place students with coveted research opportunities. The development of the Nation's future Science, Technology, Engineering and Mathematics (STEM) workforce may be one of the most critical functions at NASA. At Ames, the Education and Public Outreach Division leads NASA's Fellowship and Scholarship efforts for the Agency's Education NASA Internships, Fellowships, and Scholarships Line of Business and is in the forefront promoting diversity.

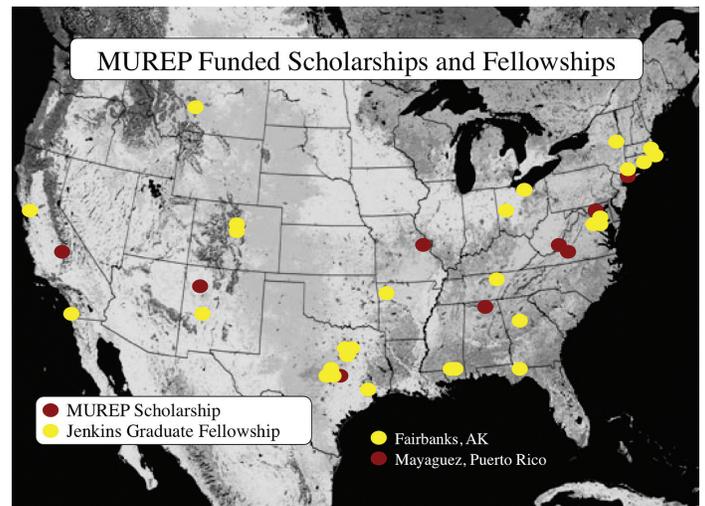
Through the NASA Minority University Research and Education Program (MUREP), 40 graduate and undergraduate students from across the United States were awarded fellowships and scholarships for the 2013-2014 academic year to increase diversity in STEM disciplines.

Thirty graduate students from 16 states and the District of Columbia were selected to receive the competitive NASA Harriett G. Jenkins Graduate Fellowship, which provides up to \$45,000 annually for a maximum of three years, and includes tuition offset, student stipend, and an annual research experience at a NASA center. The fellowship addresses NASA's mission-specific workforce needs and supports the development of the future STEM workforce

through the increased number of master's and doctoral degrees awarded to women, ethnic minorities and disabled people in STEM disciplines.

Ten undergraduate students from nine states and Puerto Rico were selected to receive the competitive MUREP scholarship, which provides an academic stipend worth as much as \$9,000 plus an additional \$6,000 for a 10-week internship at a NASA center. This scholarship supports underserved and underrepresented students pursuing STEM degrees and enables them to augment their academic learning with technical collaborations and professional development.

NASA is strengthening involvement with higher education institutions to ensure that the Agency can meet the need for a diverse workforce. Currently, minorities make up a disproportionately small percentage of graduates entering STEM fields. MUREP strives to ensure



that underrepresented and underserved students participate in NASA education and research projects, increasing the number who continue their higher education and earn advanced degrees.

For more information about the NASA Harriett G. Jenkins Graduate Fellowship and the MUREP Scholarship and to see a complete list of the 2013-2014 awardees, visit: http://www.nasa.gov/education/MUREP_2013_Awardees ■