From the Editor...

Editor In Chief Julie Rivera (University of Puerto Rico, Senior)

*In dedication of Co-op Coordinator Janine Dolinka and EOPO Chief Lori Simmons...Two Important People who have inspired me in my NASA Career.

“NASA MEANS BUSINESS”

When you think of NASA...what is the first image you see? Is it rockets? Planets, stars, and galaxies? Is it engineers and scientists? Or maybe even aliens? I know I was one of those people who quickly linked NASA to all these things. But...what about Business? Do you see yourself linking Business with NASA from the get go? It is highly doubtful.

When I first started my NASA experience, it was the summer of 2008. I remember being in my university (University of Puerto Rico) taking a normal day of class, and I got a call from a friend saying, “Hey! Come to the Faculty of Business! NASA is here recruiting!” I must confess the first thing that crossed my mind was “NASA has a business side? I thought it was only for scientists and engineers?” It just happened that I had my resume with me and thought I might as well check this out!

Two months later, I arrived at the Goddard Space Flight Center. It was the first time they had an intern in the Human Resources area in the Office of Human Capital Management (OHCM). It was one of the most significant experiences of my life! Little did I know that this was the start of my career. Six months later, in January 2009, I was back at Goddard Space Flight Center, only this time as a co-op! The first 4 months of my tour were spent working for the Office of Human Capital Management. I was then reassigned to work for the Equal Opportunity Programs Office (EOPO). It happened that in the EOPO I met what I consider the BEST supervisor ever, EOPO Chief, Lori Simmons. She gave me the chance to truly explore all other business areas in Goddard. While working with her, I had the opportunity to also work for the Legal Office, the Higher Education Office, the GEWA Exchange, and the Diversity Office.

I finally had realized that without a Business side, NASA can’t function. Engineers, Scientists, and Technicians are essential to the NASA mission for they are the ones that build and develop the things that go to space, but Business folks are the ones that manage the hiring, the procedures, the contracts, the Center strategies, the Proposals, the Project Budgets, the mediation and complaint process, among other things. I learned how important our work is for the
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NASA mission. I did not have to be a scientist or an engineer to feel my part in the NASA mission and to be a part of the NASA experience.

Today, I am still currently working for the Equal Opportunity Programs Office. My first co-op tour is about to end in a week. I will be coming back for my last co-op tour next January 2010 to the Office of Procurement, where I will learn the development and negotiation of contracts, as well as more legal terms. As I mentioned before, my university is in Puerto Rico because I live there. I am from an island where it is always warm, breezy and sunny surrounded by the nicest beaches you can find in the Caribbean. Yet, today, I am in Maryland where it is cold in the winters and very humid in the summers. What I am trying to say is, my NASA experience has completely changed me. It has made me grow in so many ways, not only professional but in a personal manner. To this very day I can say, “I LOVE MY ISLAND! BUT...I LOVE NASA MORE!” So here I am...The beginning of the rest of my 40 years in Goddard Space Flight Center. 😊

Julie Rivera
CACiN August 2009 Editor In Chief
NASA Goddard Space Flight Center
CACiN Newsletter Committee...

Name: Kenneth Getzandanner  
School: Penn State University  
Year: Senior  
Major: Aerospace Engineering  
# of Tours: 1  
Branch: Navigation and Mission Design Branch  
Hobbies: Sports, running, outdoors  
Favorite NASA Mission: Lunar Reconnaissance Orbiter  
Favorite Co-Op Memory: Watching the LRO launch from the Flight Dynamics Facility at GSFC  
How you came to be at NASA: Interned at NASA the summer after my junior year of high school and have been here ever since.  
Favorite thing about Goddard: GSFC is the perfect environment to meet complex engineering challenges and develop both academically and personally. The people who work here are some of the brightest in the world and are always willing to share their knowledge and expertise.

Name: Gina DiBraccio  
Degrees Earned: B.S., Physics and Astronomy, Business Administration, University of Pittsburgh  
Current School: University of Michigan  
Program: Atmospheric and Space Sciences (Ph.D. Program)  
Year: 1st year graduate student  
Hometown: Levittown, PA  
Area currently working in: Solar and Heliospheric Science  
Number of previous co-op tours: I have completed one tour at Glenn Research Center and transferred to Goddard Space Flight Center where I have just completed my first tour in the Heliophysics Division.  
Hobbies: Volleyball, running, reading, traveling
Name: Athena Abate  
School: The Pennsylvania State University  
Year: Junior  
Major: Electrical Engineering  
Hometown: Tobyhanna, PA  
Number of Previous Tours: 0  
Hobbies: Volleyball and Dance  
Favorite Co-op Memory: Getting to see the launch of LRO and meeting the astronauts from the STS-125.  
Favorite Thing About Goddard: My favorite thing about Goddard is that it is the only center out of all of NASA that can do everything: design, analyze, build, test and even launch.

Special Thanks To This Hard-working Team! 😊
CO-OP FACES AROUND DRYDEN

Brittany Wells

Center: DFRC
School: Embry–Riddle Aeronautical University, Prescott, AZ
Year in school: Senior
Major: Aerospace Engineering
Hometown: San Antonio, TX
Area currently working in: Operations Engineering
Number of previous co–op tours: 3
Hobbies: ballet, flying, rock climbing

Favorite NASA mission: The Apollo Program because of all the advances made throughout the entire program and the attitude that nothing is impossible.

Favorite co–op memory: There is a sign that says "Welcome to Rosamond: Gateway to Progress." The previous generation of co–ops (many of whom were our mentors) took a picture on and around the sign, so we decided to do the same thing. They had a much bigger class of coops than we do these days!
As a business Co-Op, I get questions all the time. They have business people at NASA? Isn’t the whole center just made up of engineers? I guess people figure that if engineers can do differential equations, they should be able to keep a budget on their own.

Well, it is my intention to set the record straight. Yes, there are business people at NASA, and yes, every now and then an engineer needs help with numbers. In all seriousness, though, we NASA business folk are a major part of our centers, and are involved in some of the life-changing aspects that impact the aviation and aerospace world.

Take me, for example! My job is actually kind-of interesting and significant. Well, the part where I’m not finding the right tracking numbers to use on conferences or checking an Excel sheet for errors line-by-line. Believe it or not, I am a player in getting unmanned aerial systems (UAS) in the national airspace (NAS).

Now for some current events! On February 13, 2009, President Obama signed the American Recovery and Reinvestment Act of 2009. One of the missions NASA was directed to complete with their new-found funds was to develop a plan to get UAS in the NAS.

Stimulus funds require a whole lot of tracking. President Obama wants any American citizen to be able to know exactly where their money is going, and therefore we lovely people in the budgeting office are given the task of submitting weekly, monthly, and quarterly reports revealing our progress with these funds. Enter me. Due to the reporting requirements, I get to work closely with the extremely intelligent people planning the UAS in the NAS effort to make sure I know how to cite their progress accurately.
So, for those of you who are not familiar with getting UAS in the NAS, why is it important and why should a little business person such as myself even care? The truth is that getting UAS in the NAS impacts every one of us. UAS fly missions to aid firefighters with forest fires. They identify climate change and weather patterns. UAS are also currently being used to save lives of soldiers overseas, and hopefully will be able to be used one day for transporting passengers and cargo long distances with little fuel.

While many may view me as a boring number-cruncher, I like to think of myself as a piece of the greater goals of the organization. It’s a nice thought that even though some of us are not engineers, we can still believe in and advance NASA’s mission to pioneer the future in space exploration, scientific discovery, and aeronautics research.
My name’s Jesse Lee Holloway Jr. I’m a senior attending Tuskegee University from Los Angeles, CA currently employed as a Co-Op in the Office of the CFO. I’ve got a cool experience. I started my co-op June 8th. I’m a bit of a tech head so I immediately began surfing around all of the internal websites and such. I came upon the ODIN page and saw that they had a newsletter. At the end of every issue is a monthly puzzle. Employees are encouraged to submit their answers. Those that get the answer correct gain a submission into a raffle and the winner pulled gets a gift card to somewhere near the center to eat. To my surprise, I received an email not long after the deadline saying my submission won. I one day realize that I now have a mailbox, which was exciting enough alone. My first mailing was that gift card to macaroni grill. I told all my lunch room friends that very day. It was just the type of good news I needed, especially as someone in a new city and job.
This month the Glenn Research Center co-ops had the opportunity to tour two of the test facilities at Plum Brook Station in Sandusky, OH. Plum Brook is a satellite of the NASA Glenn Research Center and sits on a mostly undeveloped 6,400 acres of land. Most of the center is a wildlife preserve, but there are four test facilities on the property as well. These facilities engage in noisy and potentially explosive activities, and therefore require a large area of undeveloped land around them should an accident ever occur.

First on the tour was the Spacecraft Propulsion Research Facility, known fondly by Plum Brook employees as B-2. B-2 simulates high-altitude conditions and can test full-scale upper-stage launch vehicles and rocket engines. There is no other test facility in the world that can do this! The facility can simulate various space environments such as solar heating, low pressures (as low as $10^{-7}$ torr!), and low temperatures (down to -320 °F). Engines as large as 400,000 lb, can be tested in the facility.

The test chamber is 35 feet in diameter and 55 ft deep. A spray chamber sits below the test chamber and houses 1.75 million gallons of cooling water. The water is pumped and sprayed on engine exhaust gases to provide cooling.

During testing, operators cannot be inside the facility for safety reasons. Instead, they stay in a control room that is located 2,600 feet from the test site. The control room is newly refurbished; modern workstations with new process control software were recently
installed, and the goal is to provide some automation in running tests once the facility is operational again. A new data acquisition lab is also in the works.

The second stop on the tour was the world's largest vacuum chamber: the Space Power Facility (SPF). The SPF is a low earth orbit environment simulation chamber that was designed to test both nuclear and non-nuclear flight hardware; the facility has only been used for non-nuclear tests thus far. The test chamber is capable of operating under a high vacuum ($10^{-6}$ torr) and can simulate solar radiation, the solar spectrum, and cold environments (as low as $-320^\circ$F).

The test chamber is constructed from aluminum 100 feet in diameter and 122 feet high. Because a high vacuum is pulled inside the test chamber, it is necessary to pull a partial vacuum (~20 torr) outside it. A concrete chamber encloses the aluminum chamber, and a partial vacuum is pulled between the two. If the concrete chamber were not present, the atmospheric pressure surrounding the aluminum chamber (while under high vacuum) would crush it! The vacuum pumps are housed beneath the test chamber. There are 16 oil diffusion pumps and 10 cryopumps that can be used to pull high vacuum in the test chamber.

A large assembly area sits just outside the test chamber and contains a large overhead crane capable of lifting up to 25 tons. The assembly area gives the flexibility of having two test articles in the facility at any time (one in the test chamber and one in the assembly area).

Overall, it was a very successful (and fun) trip! We were able to meet with some very knowledgeable engineers and all came away with a newfound appreciation for just how world-class Plum Brook's facilities really are!
My name is Elaine Petro and I work at GSFC. I'm a rising senior with a major in Aerospace Engineering and a minor in Spanish at the University of Maryland, College Park. I'm from a small town called Poolesville, which is in Maryland. I'm working in Code 546 Contamination and Coatings and have been put on the James Webb Space Telescope Project. I will also be doing a research project in which I will help develop a Cavity Ring-down Spectroscopy system which will hopefully extend on orbit laser lifetime. I began my Co-op this January, worked part-time while at school, and returned for full-time work this summer. My hobbies when not doing loads of homework and working here at Goddard are playing field hockey at school, skiing and snowboarding. I'm also involved in the Maryland Chapter of the Tau Beta Pi Engineering Honor Society and will be taking over as a “Co-President” next year. My favorite NASA mission is HST because it has been and continues to be an unbelievable success and has led to so much discovery about the universe. I had the opportunity to work on SM4 in a previous internship and aside from its scientific contributions; the servicing of Hubble is pretty incredible in itself.

Brayler Gonzalez
Center: Goddard Space Flight Center
School: Old Dominion University
Year in school: Junior
Major: Mechanical Engineering
Hometown: Richmond, Va
Area currently working in: Components and Hardware Systems Branch 596
Number of previous co-op tours: 0
Hobbies: Playing all kinds of sports, especially: baseball, football, basketball, and racquetball, dancing, rock climbing, rocketry
Favorite NASA mission: The current one I’m working on which is Magnetospheric MultiScale
Favorite co-op memory: Haven’t been here enough time to have a favorite.
Stephen McKim
Center: Goddard Space Flight Center
University: Iowa State University
Year in school: Senior
Major: Aerospace Engineering
Hometown: Kansas City
Area currently working in: I am currently working in Code 597, Propulsion
Number of Previous Co-op Tours: I started in Summer 2007, so I am currently on my third rotation
Hobbies: I enjoy high powered amateur rocketry, reading science history and non-fiction, camping, and backpacking.
Favorite NASA Mission: The Apollo Program. If you are looking for a current mission, it would have to be SDO (Solar Dynamics Observatory)
Favorite Co-op Memory: One of my favorite Co-Op memories is working on flight hardware for the first time. During my first tour, a fellow co-op and I worked for a couple of days taping electrical harnesses on SDO’s propulsion module, as well as running and assisting in pressure tests of the different pressure panels on the module. It was the first work I had ever done on an actual mission that would be launched, and such an experience taught me a lot about what goes into making a spacecraft, as well as the high standards required by engineering work in building spacecraft.

Divyang Mago
Center: Wallops Flight Facility
School: University of Pennsylvania
Year in school: 1st year Graduate Student
Major: Systems Engineering
Hometown: DC Metro Area
Area currently working in: Wallops Island, VA
Number of previous co-op tours: 2
Hobbies: Sports – every sport possible, reading, see new things, cooking, and reading to name a few.
Favorite NASA mission: Hubble Space Telescope
Favorite co-op memory: Working the Max Launch Abort System Mission. This mission was something entirely different and the successful launch made it a great mission to be a part of.
launching to the FUTURE

By: Divyang Mago

Working at NASA Wallops Flight Facility (WFF), I have been able to immerse myself in the multitude of opportunities that NASA offers, everything from helping program a newer and faster Radar Communication Link Analysis utility to visualizing sounding rocket launches pre flight, post flight, and real time. These experiences have allowed me to see various parts of the working environment, whether it is in the Range Control Center or Telemetry Readout Room for a sounding rocket launch or in the lab programming new utilities and upgrades.

At WFF I work for the Systems Software Engineering Branch, Code 589, and more specifically I work in the Mission Planning Lab. The Mission Planning Lab (MPL) is a project designed and developed by the NASA Wallops Systems Software Engineering Branch. The purpose of MPL is to use simulation and visualization to aid in the planning and decision making processes of a mission or project. MPL is a collection of commercial-off-the-shelf, government-off-the-shelf, and custom software. MPL provides a mathematically correct, visually rich environment that allows realistic simulation, presentation and evaluation of platform selection, flight profiles, and range asset placement. MPL has also yielded a real-time spin-off project called Visualization in Real Time Experiment (VIRTEX). The VIRTEX environment uses the same detailed 3D mechanical models and dynamic reports utilized by MPL. VIRTEX displays vehicle attitude maneuvers, stage separation events, and dynamic alphanumeric reports on mission parameters as data enters the WFF Range Control Center during powered vehicle flight.

I never imagined feeling excited to come in to work at midnight until I began my co-op work at the Mission Planning Lab. The Max Launch Abort System (MLAS) was set to launch and it was my responsibility to run the relay laptop in the Telemetry Readout room. This laptop was responsible for receiving serial ACS data from a telemetry processing computer,
processing that data, and then sending out that processed data to the Range Control Center for VIRTEX. After multiple sequence test and dress rehearsals, the excitement was building for the actual launch date. The launch day finally arrived and as I groggily woke up at midnight I realized that today I would have an entirely unique experience. As I sat through the countdown I marveled at how everyone knew their roles and functions and how they were performing them flawlessly. I was tasked to configure the laptop with the correct azimuth and elevation of the vehicle using data sent by the engineers on the ground. I then had to verify that correct data was flowing and restart the relay two minutes prior to launch.

After almost four and a half hours it was time for the MLAS to lift off. “T minus 10, 9, 8, 7, 6,” It felt surreal as if I was in a movie as the programmer continued “5, 4, 3, 2, 1, 0” BOOM! I heard the rocket motors ignite and saw the vehicle lift off the ground. As the vehicle was in flight I was ecstatic to see that launch looked like the pre-flight visualization that we created in the MPL. Multiple parachutes were deployed and the crew module eventually landed effortlessly in the Atlantic.

As I entered the post mission de-brief, it was great to see so many people congratulating each other on a job well done. This was a truly gratifying experience, being able to see hundreds of people come together and work as a cohesive team to achieve their one common goal. As I look back now I realize that this was just one of the many exciting things that I have been a part of as a co-op at Wallops Flight Facility, and I look forward to the future knowing that there are many great opportunities ahead of me.

More information about MPL can be found at [http://sites.wff.nasa.gov/mpl/](http://sites.wff.nasa.gov/mpl/)
Ever since my interview here at Goddard Space Flight Center this past winter break, I knew I was surrounded by things that interested me. As any other co-op my first week being here took some getting used to. The one thing that I never forgot was the hospitality here and friendliness people have towards you and the people around them. Ever since orientation I’ve been hearing that most of the people that start at Goddard stay at Goddard for 20 to 30 years, and I knew there had to be a reason. My supervisor, mentor and my co-workers have made me feel comfortable while also pushing me to be better at their current field of study. I can’t speak for everyone but as far as feeling comfortable around your working environment, I can see why everyone here stays for such a long time. It’s because Goddard as a whole makes you feel welcome, as well as the people in my everyday working environment.

My job responsibility is designing and analyzing space flight hardware. I am currently working on preparing thermal and stress analysis using CF Design which is the leading fluid flow analysis and electronics cooling computational fluid dynamics software solution for product development and Femap which is an engineering analysis program that is used to build finite element models of complex engineering problems "pre-processing" and view solution results "post-processing". With this software I work on electronic control systems that are responsible for managing and commanding different parts of the satellite. Personally I enjoy my job because with these programs it’s trial and error, so if something goes wrong it will tell you after the analysis and then it’s time to backtrack and figure out why we got these results. Overall I am happy where I am submerged in this NASA culture and Goddard has definitely been the reason why.
CO-OP FACES AROUND JOHNSON

Name: Scottie Beth Fleming
School: Georgia Tech
Year in School: Senior
Major: Aerospace Engineering
Hometown: Scottsville, KY
# of Previous NASA tours: 5
Favorite NASA Memory/Co-op Memory: There are really too many things to pick from as a favorite memory, but one standout memory is from my 1st semester co-oping, the first time all the new co-ops met. We gathered at Kemah, and I felt like I had finally met people I could really relate to. I met two of my best friends that day, and we ended up living together later on. They’re both full time now, and it’s great to know they will be in Houston when I come back!

How I came to be at NASA: I had always been interested in co-oping for NASA. Just like most every other co-op, I attended Space Camp 40 million times, and told everyone I knew that I was going to work for NASA. I picked Georgia Tech because of the outstanding co-op program, and its close relationship with NASA. I was lucky enough to get an interview my second semester of college…. And you know the rest of the story
Favorite NASA Mission: Constellation!
Favorite Thing about Johnson: The atmosphere. The openness and friendliness of this campus lends to a great work environment and very happy employees.
Other Hobbies: Pilot’s license, scuba certified, Phi Mu social sorority, working out in the mornings, watching SYTYCD and True Blood :)


CO-OP FACES AROUND KENNEDY

Name: Jerrell Drumgool
School: Morgan State University, Baltimore, MD
Year in School: Senior
Major: Civil Engineering
Hometown: South Philadelphia
Number of Previous NASA tours: 0
Hobbies: Any type of sport
Branch: TA( Center Of Operations), Environmental Management Branch
Favorite NASA Memory/Co-op Memory: I was able to watch the STS-127 shuttle Launch on my birthday.

Favorite NASA program/mission: I would say the best program NASA offers would have to be this program, the NASA Co-op program. The main reason why I believe this program is the best is because it gives young and bright students the opportunity to work for a great Government Agency and also the ability for younger people to use their talents so that NASA is able to complete their ultimate mission, which is Space Exploration.

How you came to be at NASA: I heard about the co-op program through my college mentor. She actually went through this program as well and now she is working here, at KSC, full time. She was the one who motivated me to apply and look into it even more.

Favorite thing about Kennedy: Getting to see a shuttle launch!!
It's odd to think that shuttle launches (and indeed all manned launches) have become routine for many people in America; launching any craft into space, especially those carrying people, is a dangerous and hazardous undertaking, something of which NASA and contractor employees are very aware. There are many redundancies, checks, and balances to ensure crew and mission safety. The general public, however, just sees that we have reliably and safely launched the shuttle numerous times, many of them on the first available and planned launch date. But this launch that of STS-127, did remind people that spaceflight isn’t as routine as many think it is.

Our first launch countdown began on June 10th, preparing for a June 13th (Saturday morning) launch, but as tanking was happening, a gaseous hydrogen leak was detected in a vent line near the Ground Umbilical Carrier Plate (GUCP). During hydrogen fueling, the addition of cold hydrogen to the warm external tank (ET) results in small amounts of hydrogen boiling off, which raises the gas pressure in the tank. The vent line relieves this pressure by transporting the gaseous hydrogen away to be flared off. Therefore, a leak in this equipment is a critical problem. The launch was scrubbed at 0026 (EDT).

Our second launch attempt, June 17th (Wednesday morning), once tanking had commenced; it had been delayed due to bad weather around the launch site. Two hours after tanking began, the leak was detected once more, leading to the launch being scrubbed at 0155 (EDT).

After the failed launch attempts, NASA officials worked the leak problem and discovered the issue, in part with the assistance of the KSC Prototype Lab, a division used and noted for off-the-cuff, unique, limited-time, and limited-production designs. Testing on July 1st indicated that the vent port housing was misaligned, causing the leaking. After replacing a rigid seal with a more flexible one designed to keep its seal, even under the stresses of cryogenic tanking, the shuttle was once more ready for launch.

Our third launch attempt was scheduled for July 11th (Saturday evening), but this time, the nasty Florida weather prevented our launch; the night before we were scheduled to lift off, a massive thunder and lightning storm sent 11 bolts of lightning into the ground within .35mi (.56km) of the launch pad. This was close enough strong enough, that NASA engineers decided to push launch off by 24 hours to ensure that no damage had been done to flight equipment.

The fourth scheduled launch attempt, July 12th (Sunday evening), was scrubbed at T-9, also because of weather. During the final “go/no-go” polling, Mission Control declared a “no-go” because of poor weather conditions for a possible Return-to-Launch-Site (RTLS) abort. The 5th launch attempt on July 13th (Monday
evening) met a similar fate, as anvil clouds and lightning were present, as well as field mill readings that were beyond acceptable thresholds.

The original window for launching STS-127 was supposed to end on Tuesday, July 14th, and not be open again until July 25th, but after discussions with the Russian Space Agency, the window for STS-127 was extended to Thursday the 16th. (Roskosmos had to be consulted, as they are launching Progress 34 about 2 weeks after 127’s launch).

With tensions from spectators and fatigue from employees mounting, the 6th launch attempt was scheduled for July 15th at 1803 (EDT). This time, the launch came off without a hitch—the area had been pounded by storms earlier in the day, and that seemed to “get it out of Florida’s system”, as one engineer was heard to remark. The weather was clear and sunny when Endeavour lifted off of Launch Pad 39A.

However, all did not stay well, it seems. Two minutes into flight, the shuttle was struck by multiple pieces of debris from the ET; NASA states that this is more debris than we usually see coming from the tank, and so investigations are underway as to the damage caused (if any; it currently looks as though there was no significant impact to the orbiter) and what caused the 8 or 9 pieces of foam to detach from the ET.

STS-127 is ISS assembly flight 2J/A, delivering the remaining two components of the Japanese Experiment Module and the Exposed Section of the Experiment Logistics Module (the “back porch”). This mission is the 158th American manned space flight, 128th Space Shuttle mission, 23rd flight of Endeavour, and 29th mission to the ISS (these details taken from: http://www.cbsnews.com/network/news/space/127/127quicklook1.html).

After docking with the International Space Station, Endeavour will be setting the record for the greatest number of humans on the ISS at one time, with 13 (which also ties the record for the greatest number in space at any one time). The crew of STS-127 includes Commander Mark Polansky, Pilot Douglas Hurley, Mission Specialist Christopher Cassidy, Mission Specialist Julie Payette (of the Canadian Space Agency), Mission Specialist Thomas Marshburn, Mission Specialist David Wolf, and Mission Specialist Timothy Kopra. Koichi Wakata of the Japanese Space Agency (JAXA) will be returning to earth in Timothy Kopra’s place. With the presence of Julie Payette on the ISS, this will also mark the first time that two Canadian astronauts have been in space at the same time.

So, among all the details, how is this relevant to the co-op community? I mean, beyond the fact that we just put another shuttle into space, which is relevant to all of NASA; what about this is specific to us?

Well, the keyword here is “opportunity”. I recently attended New Employee Orientation; a number of presentations were given, including one by a woman from XA (External Relations) about the number of ways to get involved with the public. Several volunteer opportunities were presented, and I chose to volunteer
to be a bus escort and a judge at local science fairs (for when the school year starts up again, of course). I had no idea that I would be an escort for congressional guests, the friends, family, and constituents of our lawmakers.

I can honestly say that the job was a lot of fun; I talked about my job, I pointed out buildings and discussed their functions and history, I took questions from the crowd (mostly about Constellation and what’s going to happen to the orbiters when we retire the fleet), and I watched the launch from the much-desired Banana Creek Viewing Site. I got requests to be back on my original bus, with “my” original crowd, because they enjoyed what I had to say.

I might have even inspired others to follow in my footsteps—I was approached both by grade-school children (one of whom had an amazing knowledge of orbiter statistics) and by a senior in high school, wanting to know how I got where I am, and in the high schooler’s case, if I could help him become an intern or co-op. I was asked for my business card more than once. I was honored to be told that I gave a great presentation… by a retired Apollo-era engineer.

All-in-all, I’m looking forward to the next launch, when I’ll be returning as an escort to educate and hopefully inspire a whole new group of people.
Brandon Haygood

I’m a graduating senior Management Information Systems Major at Norfolk State University. My position title is a Information Technician in the organization of The Office of the Chief Information Officer(OCIO). The project I am currently involved with is the NASA Digital Library(NDL). I am responsible for the collecting and analyzing of a number of data calls that are in relation to all the agency libraries.
Christie Funk does not consider herself a "traditional" Langley Aerospace Research Summer Scholars (LARSS) program student. Her non-traditional route, her drive and her passion have landed her exactly where she wants to be – at NASA.

"The LARSS program has not only significantly changed my life but also solidified the direction that I want my life to take," Funk said. "Experiences along the way somehow led me here, and I can't imagine being anywhere else."

Funk was a full-time student, working toward her degree in business management, and she was working full-time as a restaurant manager at Saddleridge in Hampton when Debbie Murray, LARSS program coordinator, was there making a reservation for the Undergraduate Student Research Program (USRP) group from NASA Langley. Funk was already researching opportunities at Langley. She used the conversation as an opportunity to pass on her resume.

Funk was put in touch with Walt Silva of the Research and Technology Directorate "and the journey began."

"I was struggling with the career transition that I wanted to make, as I had earned a bachelors degree in business and wanted to pursue a career in aerospace," she said.

After receiving her first degree, Funk began her first of three sessions as a LARSS student and became a graduate student at Embry-Riddle Aeronautical University, attending classes online. She will graduate this year with a masters degree in aeronautical science.

"Enrolling in the graduate program at Embry-Riddle was a good start, but LARSS was the perfect opportunity for me to enter into the industry and gain experience from the most qualified scientists and engineers," she said.

Her third session as a LARSS student begins in June. This fall, she will attend Old Dominion University to work on a second masters degree in aerospace engineering.

Funk witnessed her first live shuttle launch in 2008. "Watching that launch up close intensified my desire to pursue my goals," she said.

Funk is fascinated by aeronautics. She hopes to get her pilot's license and maybe one day "hitch a ride to the moon." She also hopes to witness a human land on Mars, and she would like to work on a project developing the next generation transport aircraft and fighter aircraft.

She is equally fascinated by her work in the Research and Technology Directorate. As an intern in the Aeroelasticity Branch, she is working alongside a team of engineers in tests at the Transonic Dynamic Tunnel (TDT).

"During testing, I am helping the engineers with as many tasks as possible," Funk said. "I have been able to help with the model installation, calibration procedures and control room set up."

Over the next few weeks, she will participate in monitoring the model's responses to
changing conditions. "I will also be able to see how implementing various control laws can increase the flutter boundary for the model," she said.

Funk is taking full advantage of the opportunities afforded to her. "I feel so fortunate that I have had the opportunity to work on these types of projects. I have the opportunity to attend lectures, use resources from the technical library, network with others and work alongside the most intelligent scientists and engineers at NASA Langley," she said. "I also had the opportunity to participate in Aerospace Day at the General Assembly. As a member of a team of three, we spoke to Virginia senators and delegates about the importance of student involvement at NASA and NASA’s missions."

And she doesn’t consider her location too shabby either. "I am working in the TDT, a tunnel with historical significance and opportunities for relevant research," Funk said.

One day, she hopes to give back and be able to mentor students, the same way Walt Silva and Boyd Perry have mentored her. "Being able to mentor another student would mean that I have excelled in some expertise relative to NASA’s goals and that would be an incredible accomplishment," Funk said.

Silva, Perry and many others, including Debbie Murray and Sarah Pauls of the LARSS Program Office, have truly impacted her life.

"The opportunities that I have had through the LARSS program simply cannot be measured," Funk said. "From the people, to the projects, to the exposure, to 'all things NASA,' this experience is simply the best!"

Funk, a Hampton Roads native, loves "catching an F-22 putting on a show on my way in to work, the beach on a really hot, sunny day and air and space topics." She is also an animal lover and a collector of quotes.

"My current quote is: 'The greater danger for most of us lies not in setting our aim too high and falling short; but in setting our aim too low, and achieving our mark,' " by Michelangelo.

"And I always remember that 'perseverance pays off,' " she added.

Perseverance and encouragement got her through two complete LARSS sessions and one degree with another session and degree just ahead, no matter how untraditional or unlikely it may have seemed at one point.

"The encouragement I have received has made it that much easier to go after my dreams," Funk said.

Article can be found @ - http://www.nasa.gov/centers/langley/news/researchernews/snapshot_cfunk.html

Image above: Langley Aerospace Research Summer Scholars (LARSS) student Christie Funk performs end-to-end checks for the unsteady pressure transducers on the Semi-span Supersonic Transport Wing located in the Transonic Dynamic Tunnel (TDT). NASA/Sean Smith
Sailing at the Hampton Yacht Club

By Brett Pearce

The heat of summer has come, and I now find myself at Langley Aeronautical Research Center instead of my native Kennedy Space Center. It is most interesting seeing another center, although it does take some time to get used to the various idiosyncrasies of Langley. Sadly, my wings have been clipped, as I haven’t flown once since I left KSC. However, I have returned to one of my other pursuits that I began with my tour up here last year: sailing.

Here in Langley, I take to the seas from the Hampton Yacht Club. These are not the easy-going daysailers or little Hobie Cats, but rather sleek cruisers and racing yachts, anywhere from 20 to 40 feet in length. These are large boats, requiring both numerous and skilled crewmembers working in unison. The club hosts crewing classes, since the boats require from 3 to 12 people to effectively crew them. I had some prior experience with a Hobie 16 with one of my soaring instructors, but I yearned to give the big yachts a try. My first experience on the racing yachts was my rotation last summer up here when I crewed under Tom Peddy on his vessel, the Impulse. A competitive and knowledgeable skipper, I’ll never forget his first words when I came aboard. After telling me with a chuckle that he wouldn’t sing to us during the race, he proclaimed his number one rule. “Don’t fall off the boat. But, if you do fall off the boat and we throw you a beer in a coozie, it means we’ll pick you up on the next lap!” I learned a great deal that summer, and developed a love for sailing.

When I returned this year, I sought to crew again under Tom, but I found out he is on hiatus as he welcomes his new child into the world. I had to find another boat. The two I have been going out regularly on this year are the S.V. Cyrano and S.V. Kingfisher.

Cyrano is a beautiful 36 foot sloop, with smooth lines and a clipper bow. Kingfisher is a handsome vessel, slightly smaller with trim lines and Kevlar sails. Both are guided by expert captains (Bob Mosby and Dixon Wilde, respectively), swift in the water and fun vessels to crew on.

Each Wednesday we have a regatta out in the Chesapeake bay, which offers a chance to practice for the weekend races. Most of the time, I have been what is known as a “grinder”, which means I work the winches back in the cockpit which control the jib, or forward sail. When a boat changes directions (A “tack” or “jibe”, depending on wind direction), the sails must be reset for the new angle on the wind. It is a coordinated exercise among the cockpit, captain, and foredeck, and the faster and more precisely its executed, the faster your time will be. It’s a flurry of activity, with the boat turning, sails flapping and snapping back tight, lines running, and people scurrying from one side of the boat to the other as the sails fill and she heels over.

Once she set, you then “trim” the sails for the angle on the wind to maximize speed. In many ways, it is like flying with a wing vertical instead of horizontal. Once everything is trimmed, you go to the high side of the boat (in
Cyrano under full sail, flying spinnaker

strong winds your heeled over anywhere from 15 degrees, which is ideal, to as much as 45 or 50 degrees temporarily in a puff!) to try and hold it at the ideal 15 degree list, feet hanging over the side of the boat.

I remember one time on Cyrano I was grinding, with a skilled lady name Jen tailing for me (The rope is wound loosely around the winch—only by applying tension can the rope be pulled, hence a person to hold the tail of the rope while I grind the winch to pull in the job), and normally as you grind closer and closer to a trimmed condition the boat heels further and further. I was grinding, and burst of wind hit us—the boat heeled over and a little water was coming over the side at my feet! Since the speed of the grinder is important as it determines how fast you get back to full sail, it was vitally important that I grind as fast as I could. I slipped a bit, and slid to the low side, but I was still grinding at full speed! (This is also the reason I was assigned grinder, I’m 6’5 and 250 lbs, and you want your big guys to grind as fast and hard as you can—Believe me, in strong winds with full sails, it takes that much muscle to rein in the sails even with a winch with 2 gear ratio’s!) Only when Jen called for me to stop did I cease my efforts and head to the high side. As I clambered over full of adrenalin and excitement and made my equipment for the next tack, I looked back at Captain Bob Mosby, and couldn’t help but grin. Sitting on the low side with one hand on the helm, he gave a big smile and said “This boat likes to go fast!”

Eventually, I’ve moved on to other positions, such as working strings (which entails working the halyards—the lines which raise and lower the sails as well as adjusting the tophaul,outhaul, and Cunningham on the mainsheet), as well as trimming the jib. Jen, the lady who I teamed up with grinding and her fiancée Richard have both been excellent instructors, teaching me sailing technique and tactics. I particularly like grinding and trimming, since it entails both the brawn of quickly tacking and jibing, as well as brains for trimming the sails (Just like a wing when I’m flying!). I also raced in the Executive Cup on Kingfisher under Captain Wilde, where we finished first in the line (Second in time).

The races are exciting, and sailing does have a magic all its own. Perhaps it’s no surprise that many of my aviator friends also sail. Personally, I think it’s that same sense of adventure and accomplishment that is at the core of both pursuits. Since we’ve started, several other students up here have joined in, and quite a few HYC boats have Langley students serving as crew. Captain Peddy gave me some lessons in skippering, allowing me to take the boat, and I confess that it was a most splendid experience. There is nothing like heading across the sea, pushed along by the breeze, with your hand on the helm and the wind in your face.
Co-op Faces Around Marshall

Name: Jennifer M. DiBello

Branch: ES22 - Life Support, Thermal, & Mechanical Analysis branch

School: The Pennsylvania State University

Year in School: 5th-year Senior, graduating in December 2009

Major: Mechanical Engineering

Hometown: Moscow, PA

Hobbies: Reading, Crafting, Dancing, Singing, Acting

Extracurriculars: Reformed University Fellowship (RUF), Penn State Women in Engineering Program (WEP) – mentor program, Phi Sigma Rho - Engineering Sorority

Previous Co-op Tours: (2) Spring 2008: tested the Water Recovery System for flight; Fall 2008: built the integrated time-phase schematic for the J-2X Main Propulsion System

Current Co-op Tour: Summer 2009: thermal analysis of the test fixture for the common bulkhead

Favorite Co-op Memory: Caravanning to see 2 (on-time!) Endeavour launches with a bunch of other co-ops/interns/new-hires. The second launch (STS-126) carried up the Water Recovery System, or the space toilet, that I helped test for flight my first co-op semester!

Favorite NASA mission: International Space Station – learning how to live in space to advance further exploration!

Favorite thing about Marshall: My co-op showed me the application of what I had been learning in the classroom and helped give me stronger motivation and understanding of my work and desire to tell everyone why they should support NASA. I also met my fiancé (and fellow co-op) and we’re getting married next summer!
The Magic of Moon Dust

When going to the moon, there are a few things you need to pack: food, water, space suit, camera, board games, snacks, lunar rover, tooth brush, extra clothes... you get the idea. Sounds like a trip to summer camp, right? In many ways, a trip to the moon is just like summer camp - you still have to deal with that smelly bunkmate, your food is unidentifiable (what IS that stuff they feed astronauts?), and you always have someone telling you what to do. But the big difference -- besides 1/6th earth gravity and no atmosphere -- is the dust.

You see, the moon has gotten a lot of meteorite traffic in the last billion years. These meteors pound the glassy rock on the moon into tiny jagged pieces. Then, the dust on the moon pretty much does not move. There’s no wind to carry it, no animals or people to walk on it, and no plants to grow in it. Since it’s not had a chance to be worn down like the dust here on earth, it’s still super-jagged and sharp. This is a picture of the lunar dust through a microscope:

![Image of lunar dust]


So, what’s the problem with jagged dust? Think about those little prickly spurs that cling to your clothes when you’re out in the woods. The moon dust acts a lot like that. It clings to everything, and trying to wipe it off just buries it deeper into the surface. Here are some pictures of dust-covered Apollo 17 astronauts:

![Picture of astronauts covered in dust]


The moon dust got into the seals of the astronaut suits and actually caused substantial leaking! That’s a bad quality in a space suit! Also, because it’s so abrasive, the moon dust can destroy bearing seals and jam up bearings – something important to consider when designing machinery for a permanent lunar colony.

So, here at Marshall, one of our many tasks is to look at the effects of lunar dust on mechanisms -- specifically the how the efficiency and functionality of the mechanisms are affected by the dust over time. To do our tests, we’ve ordered some lunar dust simulant. In order to handle the simulant for testing, we had to get respirators. To the right is a picture of me in my respirator. Pretty stylish, don’t you think?

My group has its own prototyping lab, and I’ve been lucky enough to have the opportunity to become certified on the lathe and mill. I’ve been able to carry out both the design and fabrication of my project, which is a special privilege in my opinion. Here’s a picture of me working on the lathe:

![Picture of Amy McDow working on lathe]

We will begin testing soon, and I’m excited to finally see some data. It’s a thrilling opportunity to help prepare human kind for summer camp.. er, I mean ‘life’ on the moon!

-Amy McDow, MSFC Coop, Summer 2009
This month's CACiN was put together by the CAC Team at the Goddard Space Flight Center in Greenbelt, Maryland.