

2012

NASA Ames Academy for Space Exploration



Academy Profile Book
Ames Research Center
Moffett Field, CA

NASA Ames Academy for Space Exploration 2012 Profiles

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NASA Ames Academy for Space Exploration

Introduction

The NASA Ames Academy is a unique summer institute of higher learning whose goal is to help guide future leaders of the U.S. Space Program by giving them a glimpse of how the whole system works. The success of the Space Program results from the interaction of government, academia, and the private sector, each playing a critical and different role in the 55-year-old civil program. Responsibilities overlap, leaders migrate from one sector to another, and interdependence changes with each new administration.

NASA's Charter, written in the 1958 Space Act, gives NASA the main role of using and exploring space for the betterment of humankind. Congress and the President have both supported and restrained NASA as its programs have evolved. President John F. Kennedy's vision of putting a man on the Moon within the decade included much more than the Apollo spectacular of newspaper fame. After Apollo's success, NASA has constantly sought to redefine its goals and fine-tune its schedule every year seeking a budget to match its imagination. We have explored most of the planets, measured the solar system, flown humans in long-term endurance missions and short-term operational missions, invented new technology, and trained Congress, teachers, students, business people, and engineers, developing a whole new generation familiar with the expertise of the "Space Age."

The NASA Ames Research Center

The Ames Research Center (ARC), located at Moffett Field, California, in the heart of Silicon Valley, specializes in revealing new knowledge about the universe, planetary systems, and life science and in creating new technologies that enable exciting new ventures in aeronautics and space exploration. Throughout its history, results from research at Ames have significantly influenced national and international policy, enabled most of the major space missions of the past thirty years, and contributed science discoveries and engineering insights that have rewritten the textbooks. In the process of these endeavors, Ames has made numerous contributions to environmental protection, public health, and the nation's economic wellbeing.

Ames is unique in having world-class ground, airborne, and space flight research capabilities in aeronautics, astrophysics, earth sciences, astrobiology, fluid dynamics, gravitational biology, thermal protection technology, computational chemistry, planetary atmospheres, space laboratories, information sciences, and spacecraft life support.

As a result, Ames supports all aspects of the NASA vision to expand human presences to the Moon and eventually to Mars and acts as technical bridge to transfer skill, knowledge, and technologies among the NASA activities. This multidisciplinary synergy has created the world's only capability for the comprehensive study of Astrobiology -- life's origin, evolution, and distribution in the universe and destiny, from the protection of our planet to the evolution of terrestrial life into space.

Ames is the lead Center for understanding the effects of gravity on living things. Ames plays a major role in understanding the origin, evolution, and distribution of stars, planets, and life in the universe. One important activity is Ames' unique research in atmosphere and ecosystems science in support of Mission to Planet Earth and the protection of the global environment. In space technologies, Ames is also the lead Center in providing the thermal protection systems that are critical for future access to space and planetary atmospheric entry vehicles. Ames is NASA's Center of Excellence in Information Systems Technologies, encompassing research in supercomputing, networking, numerical computing software, artificial intelligence, and human factors to enable bold advances in aeronautics and space.

Ames leads the Agency in virtual institutes as the NASA Astrobiology Institute, the NASA Lunar Science Institute and the NASA Aeronautics Research Institute are located here. The virtual institutes combine diverse interdisciplinary collaborations with international partnerships, training of the next generation of researchers and education and public outreach in order to push the boundaries on their respective sciences. All Institutes have been very influential with the NASA Academy through training and support of students in the program.

In aeronautics, Ames is the Agency's lead Center in airspace operations systems, including air traffic control and human factors, and the lead Center for rotorcraft technology. Ames also has major responsibilities in the creation of design and development process tools and in wind tunnel testing.

About 1600 civil servants and over 2000 contractor personnel are employed at Ames. In addition, Ames is proud to host more than 500 graduate students, cooperative education students, post-doctoral fellows, and university faculty members who work in collaboration with Ames' preeminent scientists and technologists.

Ames is a pioneer in the application of the multidisciplinary approach in science, technology, and projects, that is, combining the perspectives, training, and technologies of a variety of disciplined experts to attack problems of exceptional difficulty. Multidisciplinary approaches are flexible and tend to stimulate cutting edge concepts. Successful application of this technique requires a deep appreciation for the talents, skills, and insights of others and ability to cross organizational lines to reveal hidden treasures of understanding. Today, more and more scientists and high tech industries are using this approach with remarkable results.

It is in this spirit of shared discovery and the synthesis of diverse talents that Ames offers the NASA Academy at Ames. Students will contribute to every aspect of successful multidisciplinary research on Earth, in the air, and in space, from the formulation of an idea to the procurement of goods and services necessary to develop it, through the management, marketing, and manufacturing necessary to turn a concept into a reality.

Academy for Space Exploration

One goal of the Academy is to provide insight into all of the elements that make the NASA missions possible, while at the same time assigning the student to one of our best researchers to contribute towards one of our missions. Each student will be handpicked by a series of gates -- panels, interviews, etc., starting with their own State Space Grant Consortium who has selected and agreed to sponsor them. The researchers at Ames are selected to provide a diverse set of tasks that covers all aspects of on-going work at the Center. The "match" between student (Research Associate) and researcher (Principal Investigator) will be done by mutual selection.

Sixty percent of the time at Ames will be spent in the laboratory of the selected Principal Investigator assisting in research. About 40% of the working time and most of the social time of the students will be spent as a "group" or "team" in plenary sessions. This time will be devoted to exchange of ideas, on forays into the highest level of decision making, prioritizing, planning, and executing our space missions. This will be done by interviews with leaders and motivators of the space program. Besides the domestic Ames' experts, we will bring in leaders from the aerospace, high-tech, and genetic engineering firms in Silicon Valley; local, state, and national political decision makers; international partners; advocates and adversaries of space exploration.

Activities – June 17th – August 24th

These dates were selected to give most students a breather before returning to school. We know this is a compromise, as no two schools have identical schedules. **It is important that the students begin together and all end together.** The success of this Academy depends not on us as much as all of the students. **We do not accept people who are not able to attend this entire period. All students must be U.S. citizens or hold a "green card." Specific exemption may be made if a national space agency is involved.**

Our intention is to assure that the students interact as a "team." We will always try to spark their leadership qualities. While we encourage the students to stay together as much as possible, we do not want them to feel trapped. All students will be housed in apartments in San Jose, a short drive from Moffett Field. Transportation will be provided each day.

We plan several trips on the weekends. These have included trips to the other NASA Centers, such as the Jet Propulsion Laboratories, Dryden Flight Research Center, and Kennedy Space Center in Florida. Shorter trips to places of interest such as Lawrence Livermore Laboratories, Monterey Bay Aquarium Research Institute, the Desert Research Institute, and other areas of interest in the West will be made. The selected students will plan additional weekend trips when they arrive. Each of the ten weeks will be a unique group experience, but at the same time the student will be working on a research project with Investigators in the Ames' laboratories or on our flight projects.

The Academy Experience

These past 15 summers, 11 - 15 students interested in life, space, or Earth sciences, space technology, or space engineering came from all over the U.S., were selected for the 10 week session to share a unique experience resulting from their own ingenuity and free spirit. Teaching and learning are not the same. Teaching is the orthodoxy of our universities and colleges; learning is the "ah-ha!" process of finding out and understanding. That is our objective: to foster curiosity, to spirit endeavor, and to inspire leadership.

All of these elements make the Ames Academy a unique experience that will last a lifetime. Students not only participate in the Academy, but are inducted into the larger Academy Family through the NASA Academy Alumni Association (NAAA). It's been said many times by Academy students in the past, and we're sure it'll be true again this summer: "This has been the best summer of my life!!"

Student Support

The NASA Academy program is co-sponsored by the participating NASA Center and the National Space Grant College and Fellowship Program. Most State Space Grant Consortium offices, as well as the Space Grant offices of the District of Columbia and Puerto Rico, support the program. Please check with the Space Grant office in your State for participation information. Space Grant Consortia offices agree to provide the students with summer stipend support and round-trip transportation to and from the participating NASA Center. The participating NASA Center agrees to host the student, providing housing, local transportation, and meals. More information on the National Space Grant College and Fellowship Program is found at: <http://www.hq.nasa.gov/spacegrant/>

Student Eligibility

- Demonstrated interest in the Space Program
- Enrolled as a junior, senior, or graduate student (as of June 1 of the program year)
- Maintain an overall B plus average
- Majoring in science (physics, chemistry, biology, etc.), math, engineering, computer science, or other areas of interest to the space program
- Be a US citizen or permanent resident (as of June 1 of the program year) or be sponsored by a participating space agency

Contact Information

NASA Academy information is obtained through these sources:

<http://www.nasa-academy.nasa.gov/>

<http://academy.arc.nasa.gov>

Telephone & email

Tel: (650) 604-2104

EMAIL: brad.bailey@nasa.gov

US mail

Brad Bailey

NASA Ames Research Center

M/S 17-1

Moffett Field, CA 94035

2012 Research Associate Profiles



**University College
London, UK**

Education and Experience:

I think of myself as a futurist and a hybrid scientist which is the result of acquiring a multidisciplinary education. As a researcher, I'm trying to understand the changes in life sciences and to enjoy challenging myself with problems in the fields of regenerative medicine, the development of artificial organs, bioengineering, and space exploration.

I was blessed to be born in the land of light, Greece, where philosophy, art, politics and literature thrived and became the roots of modern science. Philosophy means the "love of wisdom" and this has been my guiding force in my journey to knowledge. My interest in space stems as far back as grade school, but it was not until high-school that I began to get actively involved in aerospace clubs and taking piloting classes. My first astronomy class, at the age of 15, was an extra fuel for the fire that has driven me through my life to become a scientist and has motivated me to chase my dream to become an astronaut and leave the confines of our beautiful planet to set foot on another celestial body.

In 2009, I graduated from the University of Central Greece with a Bsc in Computer Science and Biomedical Informatics with a senior thesis on the development of a real-time novel cardiac patient telemonitoring system via wireless sensors under the supervision of As. Prof. Ilias Maglogiannis. During my undergraduate years, I had the opportunity to be involved and publish some interesting findings from several projects in computer-integrated telesurgery, robotic dexterity enhancement of telesurgical appliances, brain computer interface and RFID technology for preventive healthcare and medical monitoring in space.

Keeping up an inquisitive and explorative attitude, I believe, leads to a constant learning process. This approach adds to the already immense potential for innovation that exists in the field of space exploration and preservation of life. My passion for innovative technologies and projects that can significantly change the lives of people and shape the future led me

Major: Bioengineering

PI: Dr. Richard Boyle

**Email Address:
antonia2@illinois.edu**

to study the development of artificial organs and acquire a masters in Nanotechnology and Regenerative Medicine at the University College of London (UCL). As a graduate student, I worked on developing tissue engineered nerves for people that have suffered severe injuries and are in need of artificial transplants and brain implants for patients with disabilities and neurodegenerative diseases. My Msc thesis research involved the development of diamonds and carbon nanotubes via chemical vapor deposition and their integration into novel biomaterials for biomedical applications. This challenging project fostered the collaboration between the Royal Free Hospital of London, UCL Medical School, the London Center for Nanotechnology and Imperial College and gave me the opportunity to interact with some of the greatest minds in the field.

While in the medical school of the University College of London, I worked with my classmate Claire Crowley for Prof. Alexander Seifalian on the development of a tissue engineered trachea that was mimicking the properties of its real counterpart. This graduate project was the winner of the Translation to Clinic and to Commercialization of Nanotechnology Products Competition in UCL and was shortly after implanted into a 36 year old patient, Andemariam Teklesenbet, who suffered from late stage tracheal cancer. This case was the first successful artificial organ transplantation in the history of medicine and proved the potential that regenerative medicine holds for future transplantation therapies.

My genuine interest in research and knowledge has led me into the pursuit of a PhD in Bioengineering degree at the University of Illinois after being awarded seven scholarships to support my studies. I'm currently working on the development of artificial skin in Dr. Hyunjoon Kong's research lab for Biomaterials, Tissue Engineering and Stem Cell Niche. My work involves the development of 3D cell culture constructs via a layer-by-layer deposition technique with a combination of biomaterials and the use of 3T3 fibroblasts, mesenchymal stem cells and keratinocytes in order to form skin dermal layers. Apart from conducting research, I have been a teaching assistant for "Biomedical Instrumentation" and "Cell and Tissue Engineering" for which I have been recognized with the Excellence in Teaching award. This has kept me busy preparing lectures, novel experiments, culturing cells for labs and working with the students to help them grasp the more difficult concepts.

Apart from my studies, I have founded a startup, Transplants Without Donors, which is the outcome of a 3.5 year endeavor to produce an off-the-shelf technology of tissue engineered organs which are customizable for each patient and tissue engineered bioreactors that can regulate the organ microenvironment in order to develop biocompatible and biofunctional organs ready for transplantation. This entrepreneurship activity has won several awards like the Best Social Venture- Cozad New Venture Competition, Idea to product Competition, Pitchfest Competition and the Entrepreneurship & Management for Life Scientists Finals Competition to name a few. From a humanistic standpoint, the major aim of our project is to give an end to the human organ trafficking, a transnational organized crime, that is rising in third world countries and has become a lucrative facet of economic development by annihilating the need for

real organs. To this end, I have been actively involved in volunteering as the group leader for Peru, Uganda, and Costa Rica medical mission trips where we provide pharmaceuticals, vaccinations and perform surgical procedures for free to children patients. Through my volunteering in medical missions, I have experienced the devastating results of the illicit organ trade through exploited children or even prisoners that have been victims of this brutality by means of coercion, abuse of power and deception. Looking back to all my experiences in life, being a volunteer is the most important achievement that I have ever done and by far the most rewarding. Where there might have been despair in the face of one person, to see that replaced with hope is a gift beyond words.

Finally, being a member of the NASA Academy is not just a great scientific opportunity for me but fulfilling my childhood dream. I yearn to become a NASA astronaut and work on exploring life in outer space and ways to increase life expectancy on earth through novel scientific approaches within the field of the development of artificial organs and regenerative medicine. My family and friends still remember me begging my parents to buy me freeze-dried astronaut food, wearing t-shirts with the NASA logo and reading space science books in primary school. At the age of 22, it was of no surprise that I got a pilot license and a skydiving license and I feel that it's about time for me to live my dream. I am honored and overwhelmed with joy to be part of NASA. My father used to tell me from my childhood: "Chase your dreams, otherwise you'll never catch them". Thank you for helping me make my wildest dream come true.

Extracurricular activities:

I enjoy skydiving, running marathons, swimming, TAE KWON DO and playing intramural co-ed soccer and volleyball. I am a huge fan of NASA's website articles and updates on missions but most importantly I enjoy reading the amazing research projects that are happening on NASA bases which revolutionize the world.

**McMaster University
Hamilton, Ontario, Canada**



Alana Bartolini

Education and Experience:

When I was thirteen years old I attended Space Camp Canada (Cosmodome) in Laval, Quebec. I remember sitting in the theater watching footage of astronauts on the International Space Station. The Drifter’s song “*Up On the Roof*” played in the background while the astronauts demonstrated how to drink water in the weightless environment. That moment sparked a curiosity in the human body adaptations to microgravity, and my fascination with space exploration began.

Since that time, I have continued to pursue my interest in space while completing my Bachelor’s degree in Health Sciences at McMaster University in Hamilton, Ontario. Though the majority of my program is based on human anatomy/physiology, cell biology, collaboration and presentation skills, I have had the unique opportunity to take two classes with a focus on space medicine. Through these classes I have explored the physiological impacts of spaceflight by researching changes to the cardiovascular, neurovestibular, neuromotor, and immune system, as well as sleep pattern and nutritional alterations in astronauts. I have also had the chance to meet and attend lectures by Canadian astronaut Dr. Dave Williams, and partake in a live feed chat with remote medicine specialist Dr. Christian Otto. The inspiration from these experiences has played a large role in my continuing goal to advance microgravity related medical research and support manned spaceflight.

Major: Health Sciences

PI: Dr. Joshua Alwood and Dr. Ruth Globus

**Email Address:
Alana.bartolini@learnlink.mcmaster.ca**

During my undergraduate degree I have had a large focus on clinical orthopedic research and musculoskeletal (MSK) health. While shadowing an orthopedic surgeon in Toronto, Ontario, I completed two research studies: Comparison of patient satisfaction with Oxford vs. Total Knee Arthroplasty, and Use of Tranexamic Acid in Bilateral Knee Arthroplasty. The latter of these studies showed significantly

important results, which led to its presentation at the Canadian Orthopaedic Association meeting in the summer of 2011, and my co-winning of the Dr. Barry Tobe Award for innovation and excellence in medical care. My recently completed undergraduate thesis focused on the clinical outcomes of manipulation under anesthesia after primary total knee arthroplasty. My experience with the MSK system and passion for space lead me to the NASA Academy where I will work in the Bone and Signaling Laboratory exploring the effects of radiation on osteoblasts and osteoclasts.

Interests:

My background is in competitive dance where I trained for 10 years in the styles of jazz, tap, ballet, acro, contemporary, and modern. While competing nationally with my studio, I also attended a performing arts high school where I captained the semi-professional modern company in my grade twelve year. I have completed the Royal Academy of Dance Vocation Ballet Examinations, achieving 'Distinction' in grades 1 through Advanced 2. I have continued to dance through university and have lead the McMaster Dance Company for the past two years.

In addition to dance, I adore music (at one point or another I've been able to play piano, guitar, flute, and cello), reading, volunteering, and choreographing musicals, fashion shows, and events.

**Institut Supérieur de
l'aéronautique et de l'espace
Toulouse, France**



About me:

I was born and grew up in Bordeaux, France. I developed a very early passion for astronomy because my mother used to read me short stories about space and showed me books for young children with astronomical pictures. In addition, as a university professor in Physics, my father has always been present to answer my questions. As a result, I quickly became very curious and attracted by nature. I also developed and kept an open mind about what surrounds me by watching the famous French daily documentary, “C’est pas sorcier”, which deals with a large amount of subjects from chemistry to physics, from history to geography, from nature to geology, and so on. I have always tried to have a broad culture, which helped me to develop a critical mind.

Coming from a modest background, I learned to know the value of things and I did not have many opportunities to travel. That is why I am very glad to have been selected for the NASA Academy: I will go for the first time to the USA. I am adaptable, I love working on new areas of investigation and developing new ways to solve problems. When I work on a project I do my best and I am not put off by difficulties or obstacles. I always go beyond the surface level of interpretation in my work in order to be sure to understand all the facets of problems that I tackle.

Education and Experience

I have always strived to achieve the best academic results, not only for personal satisfaction, but mostly because I have always considered that the work done will

Major: Aerospace Engineering and Mathematics

PI: Dr. Peter Jenniskens

**Email Address:
Anthony.berdeu@supaero.asae.fr**

be useful later, and that even knowledge that appears to be useless can find meaning in a future context. Obviously my academic career has been led by my passion for science and space. Nevertheless I have done my best to stay open-minded and I have never neglected other parts of the proposed courses. For instance, I participated in a national history competition when I was 16 years old and was awarded a prize for my dissertation about the protection of the

Anthony Berdeu

Jews during World War II.

After receiving my high-school diploma and winning fourth place in a Physics national competition in 2008, I went into the French “classes préparatoires” (a two-year undergraduate intensive program to prepare competitive entrance exam into French graduate schools) to prepare the entrance exam into the ENS (“Ecoles Normales Supérieures”) which are the three best French schools to become a teacher and/or researcher. I was accepted into these schools but I rapidly understood that this school did not match my aims, for it took me away from the space field, and I resigned. Even though my academic results allowed me to go to the best scientific schools in France, I have chosen to go to Supaéro, the leading French Graduate School of Aerospace Engineering.

Two years ago I took the major Astrophysics and this year majors linked with the space field. I have now been the president of the school’s Astronomy Club for a year. Furthermore, being in Supaéro has given me the opportunity to work on a project managed by ESA, the European Space Agency, in addition to my university classes. I joined the ESEO and ESMO missions, which stands for the European Student Earth/Moon Orbiter. Our team had to design, build, and integrate their stellar sensor.

During my summer internship last year, I also worked at the French Pic Du Midi Observatory based in the French Pyrenees. One part of my job was to debug the pointing program of the Bernard Lyot Telescope (2-meter diameter), which is the biggest telescope in metropolitan France.

My chance to take part in the Academy this year will not only be an amazing opportunity to improve my technical skills, but also to improve my teamwork, leadership, and communication skills, especially as a part of an international team.

Future plans:

After the summer program, I will have the opportunity to intern at NASA Ames for another 4 months. Then, I will be return to France for a 6 months internship in Toulouse. I am pursuing an Aerospace Engineering diploma from ISAE-SUPAERO, and will graduate in 2014 with a research Master of Science in Astrophysics. After my graduation, I would like to apply for a PhD in Astrophysics, certainly with a focus in Astrobiology.

Extracurricular Activities

I have been playing the piano since the age of seven and it was with pleasure that I chose to take part in the concerts at the end of year in my high school. I also played tennis for three years and rode horses for nine years. I also used to play building games (the famous LEGO!) and then video games with my two little brothers.

For my hobbies, I love reading, especially fantasy or astronomy magazines, playing cards with friends and driving. As an amateur astronomer, astronomy also takes up a huge part of my free time. I have owned two telescopes for many years, and I practice astrophotography as often as I can.

Ryan Boodee



Citadel Military College of South Carolina Charleston, SC

I was born a child of the space age. Ever since I was young, I have had a penchant for knowledge about space—one so fierce that I had read through the entire astronomy section of my library in my elementary school years. For as long as I can remember, I’ve dreamt of going to space, and understanding the “Final Frontier.”

As I have grown older, my dream has not been lost—even as many of my friends have. I started most to stray from the path of my friends in my sophomore year of high school: the year I applied and gained acceptance into the North Carolina School of Science and Mathematics (NCSSM). NCSSM is a public boarding school in which the state’s most academically gifted high school students spend their junior and senior years. At the school I was surrounded by many students who I believe will shape the future of science. Although education at NCSSM was taken very seriously, learning was as exciting as it was challenging. I further developed my focus and tenacity at this school and, excelling in physics, kept firmly on track toward my dream of someday going to space. Finally, after the two most challenging and enjoyable years of my life hitherto, I graduated from NCSSM with honors.

To continue my education I chose to attend The Citadel, Military College of South Carolina, with a full academic scholarship. Without question, The Citadel has had a tremendous effect on me both as an academic and a leader. As a trumpet player at The Citadel, in my freshman year I had an obligation to play many of the daily bugle calls for the school. The frequent duty, which must be performed punctually and reliably, helped me develop time management skills more so than any other experience I have had. Through determination and hard work, I achieved two of the highest ranking sophomore leadership positions in Regimental Band Company: Company Armorer and Company Clerk. Next year I will hold the rank of Second Battalion Supply NCO, in which I will be responsible for supplies procurement and maintenance

Major: Mathematics and Physics

PI: Dr. Pete Worden

Email: rboodee@citadel.edu

for a battalion of around 500 cadets.

The disciplined environment of The Citadel has allowed me to excel—earning a cumulative 4.0 GPA while double-majoring in Physics and Mathematics, avoiding any demerits from poor conduct or meticulous military inspections, and learning leadership through ranks I have achieved. In addition to my success at the Citadel, I was selected for an internship after my freshman year of college by a section of NASA’s South Carolina Space Grant Consortium called the “Palmetto Research Academy.” In this internship, I worked to modify a scientific camera to be used as a telescope on the Atsa Suborbital Laboratory. The results of this research were presented at the Next-Generation Suborbital Researchers Conference in Palo Alto, California on February 27, 2012. The internship with the Palmetto Research Academy has given me an even greater zeal for space, and ensured that I pursue another research experience this summer.

In the summer of 2012, I look forward to returning to California for a NASA Academy Internship at their Ames Research Facility. This summer I will research specifics regarding a one-way settlement of Mars under the Ames Center Director Dr. Pete Worden. I will then return to The Citadel for my junior and senior years, after which I hope to attend either the California Institute of Technology or the Massachusetts Institute of Technology to earn higher degrees in Physics.

Tyler Campbell



**Virginia Tech
Blacksburg, VA**

Being asked to write a one page biography is always difficult. When you sit down to write one, you're faced with a huge challenge....where to start and what to share. There are facts about your life which you find mundane but others think are fascinating. On the other hand, there are moments which you will never forget while others are quick to forget the moment you just shared. As stated, the tough question is where to start and what to share. I suppose I'll start with where my life started.

I was born in the Roanoke Memorial Hospital located in Roanoke, Virginia. I lived a childhood and teenage life of a typical American kid. I spent most of my free time either playing outside or playing video games. I started working when I was 15 and worked two jobs for the majority of my high school career. With working two jobs, I did not have much time to be involved in clubs. This is where you must be asking, "Why did this kid choose a field of science let alone intern with NASA?"

I knew when I went to college, I wanted to do something challenging. Throughout my life, I sought out challenges to overcome. Whether it was in sports, academia, or work, I felt satisfaction in overcoming problems. With that being said, what better environment full of the most difficult and complex problems than space? I was always intrigued with the moon, the stars, other planets, and the vastness of space. With this focus, I decided to attend Virginia Polytechnic Institute and State University also known as Virginia Tech to pursue a degree in Aerospace Engineering.

While at college, I have made sure to live a fulfilling and balanced college career in order to be a well-rounded individual. Academic wise, a design team in which I put together, VT Microgravity, is participating in the Johnson Space Center's Reduced Gravity Student Flight Opportunities Program where we will be testing the viability of using linear translating mass actuators for cube sat attitude control. Extra-curricular wise, I invest much time into my role as the Class of 2013 President and university governance where I have served on several projects and

**Major: Aerospace
Engineering**

PI: Chad Frost

Email: tyler91@vt.edu

committees. To share a few, I served on the Presidential Task Force Long Range Planning committee where we developed the 2012 – 2018 strategic plan for Virginia Tech. In addition, I serve on the Residential College Board of Trustees where we planned Virginia Tech's first residential college. While I enjoy research, I also enjoy big projects, strategic planning, and visionary initiatives.

My plans after college are still a little up in the air. My future will be more concrete pending the opportunities available throughout this summer and into my final year of college. I would love to attend graduate school to further my education. I may further my research on satellite attitude control, but there are other cool aspects about space such as flight trajectories, mission analysis, and rocket design that I am interested in. At the same time, pursuing a career in the space industry right out of college is also a viable option where I would like to pursue project management. My end goal is to pursue politics whether local, state, or federal.

I have been blessed with the opportunity of a life time to intern with NASA Ames. Although I am here because of my academic and extra-curricular work, so many people in this world have made investments into my character development and future success. Due to God, my family, friends, and Virginia Tech, my dreams have become a reality.



University of Colorado at Boulder Boulder, CO

Easily the best part of buying a new fridge is the huge box that comes with it. The amount of time I spent in my "spaceship" may actually rival Valeri Poyakov's current record of over 437 days, and I bet he didn't eat as many home cooked meals as I did. Looking back on it I have come to realize that using tape to seal all of the holes, so my oxygen wouldn't leak out, and pondering how to prevent my cardboard spaceship from burning up

during reentry may have been foreshadowing my engineering career. Since then I have graduated with a BS in Mechanical Engineering, worked for an international laser company, started my Master's in Bioastronautics and now work as an intern at the NASA Academy!

Education and Experiences

My young career began in earnest back in 2007 when I completed high school and started at the University of Portland in Portland, Oregon as a mechanical engineering student. While my career goals lie in the aerospace field, I wanted a diverse background in engineering and so elected to start with an ME degree and then pursue a higher degree in my true area of passion: space exploration. Additionally, UP offered a small class size of 40 mechanical engineers and opportunities to get to know and work with my professors. Throughout my education I participated in a multitude of projects including prototyping a set of hand paddles to actuate a car's pedals for people without leg functionality, turbine design, SAE Baja kart design/building and finally, my senior project, building an RC aircraft for the SAE Aero Design West Competition. Having only limited knowledge of aerodynamics I am pleased to say we successfully built a flying aircraft that landed us in 14th place overall and 2nd in written reports. It was an amazing experience to see the "Ranger" lift off the ground the second time (first time it flew into a tree) and successfully land minutes after. Next time I hope that whatever it is I design makes it all the way to space before returning back to Earth. Soon after the project, I graduated Cum Laude with a BS in Mechanical Engineering and started the next leg of my

**Major: Aerospace
Engineering Sciences**

PI: Dr. Bill Warmbrodt

**Email:
alec.devereaux@gmail.com**

journey.

In Fall 2011, I returned home to my native state of Colorado to continue my education as a graduate student at the University of Colorado. I am currently working towards my Master's in Aerospace Engineering Sciences with a focus in Bioastronautics, which is the study and support of life in space. I love my program, professors, and peers and can't wait to discover what I will learn tomorrow. Recently I have also joined the Dream Chaser graduate projects team, working closely with the Sierra Nevada Corporation to conduct human factors evaluations and first round cockpit layout analysis. Not only am I being taught by former astronauts, but I am working on an actual spacecraft which will hopefully deliver people and cargo to the ISS in the near future.

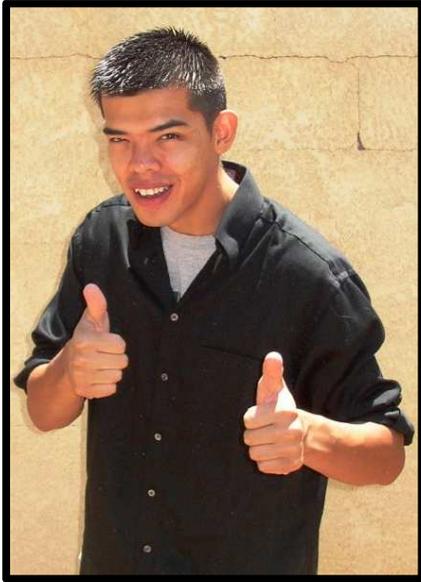
In addition to my educational background I also have a diverse work background that incorporates both an international laser corporation and a sandwich shop. I will focus on the engineering positions but can make a mean turkey melt if you're interested. In 2010, I worked at the nLIGHT Corporation, a leading producer of semi-conducting lasers. During my internship I designed tooling and laser components and tested them once they were fabricated. I spent a large portion of my days in a bunny suit in the lab assembling laser packages as well. Finally, I helped write a Phase 1 SBIR proposal on spectral beam combination. Who wouldn't want to spend a summer playing with lasers?

Additional Information and the Future

When I'm not working in the lab or finishing a homework assignment I enjoy a wide variety of activities. I am very active and love to play soccer, go on hikes, play paintball and in general be out in the sun. Also, I love to cook and learn new recipes. My friends and I often do "Iron Chef" like cook-offs, where we have a secret ingredient and see which team can make the best meal from it. Finally I really like photography both in terms of its artistic values and for documenting adventures.

I would like to continue down my current path and work for a company or organization that is involved in getting people to space. I see both the commercial and educational benefits of human spaceflight and hope that my actions and accomplishments inspire future generations of engineers and astronauts. If the opportunity arises I would also gladly go into space.

George Gorospe Jr.



University of New Mexico Albuquerque, NM

Education and Experience:

As a young boy I was naturally curious about mechanical systems, my fifth grade report was on “the modern internal combustion engine.” I loved the way the individual parts of an engine, when working in harmony, could produce significant quantities of horsepower. It was during this time that I believed that I would become a mechanic

and work to fix cars for people. I worked hard and during high school I had the opportunity to meet a group of engineers from Sandia National Laboratories. I learned from them that engineers not only fix that which is broken but they create new devices and systems to solve problems. I was immediately interested in the notion of engineering a solution to problems. Furthermore, I learned that engineers get to play with the best toys: rockets, robots, lasers, jet engines, and others. Through follow up research I found that, amongst engineers, NASA engineers have the best toys that don’t usually blow themselves up. Researching not only the equipment in use but the significant problems NASA engineers had to solve to attain manned spaceflight inspired me to work for NASA.

As a young engineer, I knew that I had a deep curiosity and urge to study robotics. Robotics is truly a multidisciplinary topic. Roboticists need knowledge of mechanical design, electrical components, and advanced programming skills to fully develop a working robot. I felt that at NASA, I could work with the best robots on earth and potentially work on the next generation of robots leaving earth to explore our solar system. During my first internship with NASA at the Ames Research Center (ARC) in Moffett Field, CA I worked in the Prognostics Center of Excellence within the Intelligent Systems Division. There I was asked to study an old recycled planetary rover. I returned the rover to operational status by troubleshooting its components, researching the old software control structure and writing an entirely new software control structure. Furthermore, I

Major: Mechanical Engineering

PI: Dr. Brad Bailey

Email: ggorospe@unm.edu

had the opportunity to challenge myself by integrating mobile Ipad control and data feedback in to the system. During my second internship with NASA, also at ARC, I participated in the NASA Ames Robotics Academy. This student managed project based program aspires to create test and launch a lunar micro rover, as a component of the Lunar X Prize competition. During this program I learned actual engineering procedures and developed and ran simulated and laboratory experiments subjecting the prototype lunar micro rover to the projected vibrational loads associated with Orbital Systems' Minotaur launch vehicles. These tests ensured that the final iteration of the lunar micro rover could survive the ascent into orbit without stress deformation or fracture.

I currently hold degrees from Dartmouth College, in Hanover, New Hampshire and the University of New Mexico (UNM), in Albuquerque, New Mexico, where I recently received my B.S. in Mechanical Engineering. While at UNM, I focused on controls theory and application to mobile autonomous robotics. I also worked and researched in UNM's Multi-Agent, Robotic, Hybrid and Embedded Systems (MARHES) Lab. During my fourth year at UNM I founded the UNM Robotics Club and secured more than \$3500 in robotics equipment for the students to use and learn with.

Future Plans

I am very interested in the future of manned spaceflight and the future robotic exploration of the solar system. At the NASA Academy for Space Exploration I hope to gain significant knowledge and insight as to the processes and mission development, and execution methods common within the agency. I hope to one day become the project manager or division head for a robotics research group within NASA.

Extracurricular Activities

When not at school (rarely), I enjoy riding my motorcycle, working on my 1969 Chevy Camaro, attending Giants baseball games, and afternoon barbeques. I also enjoy learning new languages both programming and spoken and building homebrew robotics.



**University of Michigan
Ann Arbor, MI**

Education and Experience:

I remember drawing a masterpiece, or what I thought was a masterpiece, while in my elementary art class. It was a watercolor paint and crayon drawing of space with me portrayed as an astronaut in it. Clearly, I was drawn to space even as a child, but I didn't consciously discover my passion for space until college.

I was fortunate enough to stumble upon the most rewarding experience during my freshman year at the University of Michigan, the Student Space Systems Fabrication Laboratory (S3FL). S3FL challenged me over the past four years as a leader and a student. It opened my eyes to aerospace engineering, which soon became my major. My experiences on a CanSat project my freshman year and advising the CanSat project my sophomore year led me to CubeSat research and projects in S3FL for the rest of my undergraduate career. I had the privilege to project manage a CubeSat boom project my junior year, which I was lucky enough to fly with onboard NASA's "Weightless Wonder" with my teammates. My senior year I focused on the administration side of S3FL and spacecraft operations for the University of Michigan CubeSats.

In the middle of my junior year, I also became heavily involved in the University of Michigan's Students for the Exploration and Development of Space (SEDS) Chapter's council, which leads the SEDS' initiatives on campus. Through my efforts with SEDS, I found a different view of space. Until I became involved in SEDS, I'd only focused on building /engineering projects because the design build test process seemed interesting, not WHY space is amazing or needs these projects for exploration. Something changed in me after attending many lectures on campus that SEDS hosted, but it was after Newspace 2011 that I completely understood that a career in the space industry is what I have to do with the rest of my life. I want to engineer spacecraft that enable scientists' missions to explore planets and bodies

Major: Aerospace Engineering

PI: Dr. Bill Warmbrodt

Email: sjgowell@umich.edu

and to learn about our origins and future.

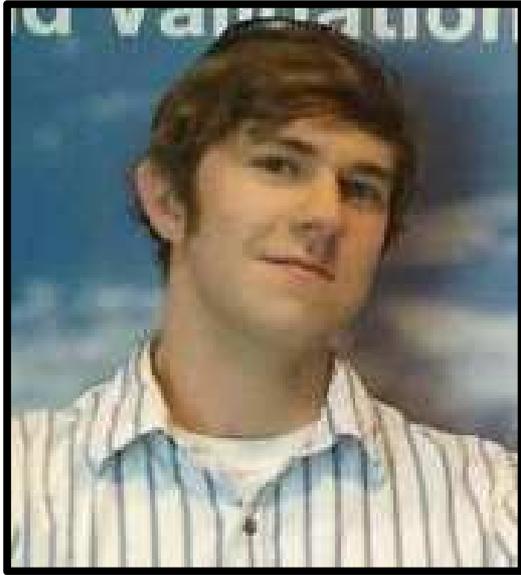
Interests & Expectations:

NASA Academy is my dream come true and something I've worked towards throughout college. I'm extremely thankful to be awarded the privilege to participate this summer. The Academy provides me an amazing opportunity to join my love of space exploration and interest in engineering together. This program is an incredible opportunity that I look forward to growing from Academy with my new peers.

Future Plans:

I plan on returning to the University of Michigan in the fall to finish my final undergraduate course. I'll then, hopefully, enter graduate school to begin a Masters of Space Engineering at the University of Michigan. Following completion of my masters, I plan to go work in the space industry as an engineer for a few years and obtain an MBA during that time so I can switch to a more business related role later in my career. My ultimate goal, however, is to go to space myself one day!

Mark James



**West Virginia University
Morgantown, WV**

Education and Experience:

When I was ten years old, my class read the book “October Sky” by West Virginian author Homer Hickam. It was from that point on that I knew I wanted to be an astronaut for NASA.

After graduating from high school, I decided to attend West Virginia University and obtain bachelor’s degrees in both aerospace and mechanical engineering. During my sophomore year, I was fortunate enough to be selected as a member of WVU’s Microgravity Research Team (MRT). This student-led research group develops, proposes, designs, and constructs an experiment to be flown aboard NASA’s Zero- G “Weightless Wonder” research aircraft. I learned much through this program as our team developed and built an experiment on magnetically controlling fluid slosh in microgravity. In my second year as a member of MRT, I was selected as Team Leader and headed a project based on electromagnetically enhancing a fluidized bed in microgravity. This time, I was able to experience weightlessness as our experiment was tested aboard the aircraft.

Between my two years on the MRT, I decided to expand my horizons and study abroad in New Zealand. I spent five months at Auckland’s Massey University studying mechanical engineering under several excellent professors. Weekends and breaks were spent traveling all around the country, seeing breathtaking sights from the Punakaiki Pancake rocks to Mount Nhauruhoe, made famous as “Mount Doom” in the Lord of the Rings movies. In addition to the education and sight-seeing, I also met several individuals who have become lifelong friends.

Back at WVU, I continued my education, and I will graduate in December 2012. After graduation, I

Major: Aerospace Engineering

PI: Dr. Butler Hine

Email: mjames7@mix.wvu.edu

plan to pursue at least a master's degree in aerospace engineering, and I hope to one day be selected as an American astronaut. I believe that this NASA Academy experience will help me to further understand the space industry and how I can be an integral part in it.

Interests

In my spare time, I enjoy traveling, reading, and playing a variety of sports. I mainly focused on track and cross country in high school, but I recently have become interested in basketball, football, and ultimate Frisbee. I am a huge fan of WVU's sports teams, and I strive to attend as many events as I can.



Nihon University College of Science and Technology Tokyo, Japan

About me

I'm very interested in the universe, because it has infinite possibilities and unknown things. If I have my pronoun, it's the spirit of inquiry or adventure spirit. I like exciting things. The universe delights me, for example, so many beautiful stars, to see the earth from space, the moment of launch of a rocket, etc. I think that I'm happy because I was born on a beautiful planet. So I want to know about

my planet and universe.

Education and Experience

I study physics because physics is a fundamental subject and I can study astronomy. I haven't decided on my graduation research content yet, but I want to do graduation research about space exploitation. I'm also doing volunteer activities. I am the leader of the Young Astronaut Club in Japan. Activities include field trips of museums, natural observation, astronomical observation, demonstration and a workshop which gives children the chance to make a water rocket and gunpowder rocket, event participation with a research institute and institution, and study about the universe, the earth, and global environment problems, etc.

Interest and Hobby

My hobby is travel abroad. I went on a trip to about 20 countries in Europe, Asia, etc. I like to talk with various different people because they tell me about new things.

Future goals

Today, satellites and probes made with innovation technologies are launched. Little by little humans are certainly reaching out into the universe.

Space exploitation is needed for more development, so we need to teach people about the importance of space exploitation. For this reason, I want to become a space consultant. I would like to step up as a space educator, as a Japanese, as an international, and as a

Major: Physics

PI: Liza Coe and Brian Day

Email: csto09048@g.nihon-u.ac.jp

member of the human race through my experience in the NASA Academy. Moreover, I would like to share my experiences and the things I learn with as many people as possible regardless of nationality.

Kayla LaFrance



University of North Dakota Grand Forks, ND

Education and Experience:

My passion for space exploration has played a large role in shaping my life. Ever since I was a young girl I dreamed of flying around the galaxy with Captain Picard and Captain Janeway. My love of Star Trek led to a love of astronomy and exploration. I became actively involved with local astronomy clubs, traveled the US attending Space Camps and national Astronomy League conventions, and spent a large majority of my time participating in extracurricular activities relating to the STEM fields.

My undergraduate education was from Belmont University in Nashville, Tenn. I earned a B.S. in Engineering Physics and minors in Math and Public Relations. While at Belmont I participated in the school's Mathematical Association of America (MAA) chapter and the Society of Physics Students (SPS) chapter. In my senior year I served as the Vice-President for SPS, and my favorite event every year was Pi-a-Prof Day, a celebration of Pi day (3-14) where the SPS would offer the student body a chance to throw a pie in the face of a physics professor for a dollar. For my participation in the Belmont Undergrad Research Symposium 2009, I did a study on Asteroid Photometry with 201 Penelope. By far my most memorable research project while at Belmont was when the SPS created the Belmont Mythbusters, and we took a look at the physics of Batman from the movie "The Dark Knight" and offered the presentation as a convocation to the student body.

I recently graduated from the University of North Dakota earning a Master's of Science in Space Studies. My independent research while at UND was devoted to the organization of Mission Control during manned surface exploration of Mars. I am fascinated by mission operations and I dream of going to Mars. I really enjoyed the topic and research and I hope to continue focusing on the topic in the future.

Interests:

While my main interest is astronomy and space exploration I do have a few other hobbies on the side to keep me busy. When I need a break from reality I turn to comic books and drawing, Batman is the only

Major: Space Studies

PI: Dr. Carol Stoker

**Email:
kayla_lafrance@hotmail.com**

superhero for me. On days I feel the need to keep my hand busy I turn to my car. I love working under the hood of vehicles and getting grease under my nails. My “baby” is a 1930 Ford Model AA flatbed. Last but not least would be my obsessive love of Ice Hockey, it keeps my heart beating. I play both goalie and left wing, I have earned my referee stripes, I volunteer helping little 5 years olds get into the game, and I cheer rather loudly no matter where I end up watching a game.

Future Plans:

I have many goals for the future all culminating with becoming an astronaut and walking on Mars. Until that day comes though, there are a few things I would like to do first. Mainly, continue my education to earn a PhD in Bioastronautics and to begin a career working with NASA to help lead the way to sending manned missions to Mars.

Patricia Randazzo



**Albertson College of
Idaho
Caldwell, ID**

Personal Background:

As a child who grew up surrounded by mountains, I have developed an unusual passion for recreational

activities. As such, discovering the world as a child was potentially very treacherous but always rewarding. Experiencing the brutal cold of winter blizzards and the sweltering heat of dry summers only made me question why the planet experienced such extremes. It was this process of constant curiosity about our planet which fueled my desire to know how things work. Alas, it seems only natural to follow the path of physics to study the behavior of nature and, in general, how the universe works.

Education and NASA Experience:

If I were to define the first moment I directly experienced a NASA event, it would be at Girl Scout summer camp in 2000 when I was selected to participate in the Innovators Camp. During this camp, we spent one week engineering shoes from cardboard and duct tape, exploring the innards of a computer tower, experimenting with household chemicals, and learning about the formation of our mountains. Each day we had a guest speaker and one of those speakers talked to us about space and NASA. She described and demonstrated NASA's mission and how NASA influences our lives. For one of her demonstrations, she placed a black orbiter tile under a red hot torch where it changed from black to red hot, then finally white. Once the heat was removed, the tile quickly returned to black. As I was observing this, so many thoughts were going through my head: do objects entering the atmosphere really get that hot, how do they keep the astronauts from overheating, what kind of insulating material is that made out of, where is all the energy going?

After that, it wouldn't be till the summer

Major: Mathematics /Physics

PI: Dr. Bill Borucki

**Email:
patricia.e.randazzo@gmail.com**

of 2010 that I would directly experience NASA again, however this time I was an intern at the NASA Johnson Space Center, mission control itself. My internship project gave me an overarching view of how NASA operates and organizes itself. After that, I have remained close with NASA, continuing my education by interning in different fields within the NASA community. I know that my experience is rare and therefore plan activities and presentations for my fellow college students, old high school, and old Girl Scout troop. In this way, I am spreading the awesomeness which is NASA.

Interests and Extra Curricular Activities:

I love almost any outdoor activity: rock climbing, hiking, trail running, canoeing, river rafting, kayaking, fishing, swimming, water skiing, camping, backpacking, skiing, etc. During my college career, I competed in freestyle skiing for four years as well as was elected Student Director for the College of Idaho's Outdoor Program for two years.

I also enjoy music of all sorts and I have played my viola with various orchestras for the past 6 years including the College of Idaho's Sinfonia as well as the Utah Youth Symphony orchestra.

I can also be found reading, writing, and playing games of various mediums (cards games, board games, computer games, and console games).

Future Plans:

Upon receiving my bachelors of science in Mathematics/Physics I hope to attend graduate school and receive my Ph.D. in planetary physics. Afterwards, I hope to continue working with NASA as a planetary physicist and researcher and ultimately support the agency as an astronaut.

Lyle Roberts



Australian National University Canberra, Australia

About me:

I have always wanted to know how everything around me works. This is why I fell in love with physics and engineering. Physics has granted me the knowledge to understand how things work at a fundamental level; whereas engineering has given me the skills needed to apply that knowledge in the practical world. I feel immense joy when learning something new, as if I am slowly unraveling the universe's mysteries one thread at a time.

I am a confident, enthusiastic and highly energetic person with a universally compatible personality. I have always enjoyed meeting new people, learning from and connecting with them. My ability to communicate and passion for teaching is demonstrated by my ongoing position as a tutor at the Australian National University (ANU); a position requiring exceptional interpersonal skills.

At the age of 23 I have an entire career ahead of me, which is both frightening and exhilarating. I am currently starting a PhD at the ANU with the Centre for Gravitational Physics developing a technology that is of significant interest to both NASA-JPL and the European Space Agency (ESA). The reason for pursuing a PhD is because it will allow me to work closely with and learn from some of the best scientists in the world at Australia's premier university. The sensation of working in the space engineering industry at the frontier of technological development is quite literally out of this world, and once I have completed this phase of my education, the next step is obvious: to work at NASA with talented and motivated engineers and scientists to help bring about humanity's continuing journey into space.

Education:

At the end of 2011 I graduated from the Australian National University with a Bachelor of Physics and a Bachelor of Engineering with First Class Honours. My background as an Engineer is in automation, sensing and control, focusing primarily on real-time digital signal processing techniques employed using field-programmable gate-array (FPGA) technology. My background as a Physicist is in applied optics and communications.

Major: Physics

PI: Dr. Friedemann Freund

**Email:
aelowyn@gmail.com**

My interests, however, are far broader than my current expertise. Quite simply, I want to know how everything works, and this is what motivates my learning more than anything.

At the moment I am studying for a PhD developing a technology called an Optical Phased Array, which combines state-of-the-art digital signal processing capabilities with applied optical physics.

Experience:

During my final year of undergraduate studies at the ANU in 2011 I completed an Honour's project titled: "High-Speed Digitally Enhanced Heterodyne Interferometry" under the supervision of Dr. Daniel Shaddock. This project embodied everything I love about physics and engineering, and was a perfect amalgamation of both applied optics and DSP.

In 2011 I was assigned the position of Project Manager for a 21 person group project intended to expose final year engineering students to real world industrial projects. My teams' project, titled 'Project Sentinel', was tasked with the full system design of an Unmanned Aerial Vehicle (UAV) bird deterrent system, designed to be used at vineyards and orchards around the world. My performance during this project demonstrates my innate ability to lead, manage and inspire a team of diverse technical backgrounds and abilities. Managing Project Sentinel taught me the importance of maintaining strong emotional intelligence, as well as identifying the best ways to motivate and inspire a team. My success as project manager can be attributed to my energetic presence in the team environment. My ability to motivate and empower the team through the transference of enthusiasm created an enjoyable team dynamic for all members.

In 2010 I was employed by Anewtech Systems in Singapore as an intern Systems Engineer. I was a member of various technical development, project management and sales teams that focused on the development of smart home and office technologies. During my internship I was exposed to various high-stakes projects, where I established myself as a confident and energetic team member. The team dynamic at Anewtech Systems was unlike any I had ever experienced before, allowing me to impart a foreign approach to project development that was well received by the company.

Laura Rodriguez



Rice University Houston, TX

I have always had a fascination for space. As a child I would force my father to wake up to watch meteor showers with me; we would spend hours in the backyard looking up into the deep dark sky. Whenever I would look up at the stars a wonderful sensation of excitement and wonder would captivate me. I wanted to know what else was out there, I wanted to explore the unknown; I wanted to become an astronaut.

Born and raised in Killeen, Texas, I was lucky enough to grow up near Johnson Space Center in Houston. Throughout the years I looked up to NASA and the work they did. I wanted to be a part of this organization that had inspired me as a child. This was all that I was certain of when I matriculated into Rice University; I knew I wanted to be an astronaut, but I wasn't sure what work I wanted to do. Every semester I changed my mind as to what to major in; it started with mechanical engineering, then chemical engineering, followed by biochemistry, and finally Earth science. Over the years I realized I wanted to work in a lab that researched the potential for life on other planets. This passion came after taking a course in astrobiology; I was intrigued by all the factors that must be considered when investigating the possibility of life in outer space. It requires knowledge from almost every science field as well as published work; pieces to the puzzle are scattered about everywhere. That is what I love most about astrobiology; determining whether a celestial body is habitable requires you to look at the whole picture to solve the puzzle.

Currently I am majoring in geochemistry with a minor in biochemistry and cell biology. After I graduate I plan on going to graduate school to eventually receive a doctorate in organic chemistry as I conduct research related to the reactivity of organic materials in space in an effort to determine the origin of life or the possibility of life on other planetary bodies. At present I work with Dr. Caroline Masiello in a lab that is researching the biochemical composition of switchgrass biofuel crops in response to nitrogen fertilizer. Last summer I was hired as a research assistant at LDEO of Columbia University where I worked with Dr. Dallas Abbott to determine whether there was a cometary impact into the Gulf of Carpentaria around 500 AD by analyzing sedimentary cores from the targeted site.

Beginning with this internship and

Major: Earth Science

PI: Dr. Chris McKay

Email: ler4@rice.edu

throughout graduate school I hope to learn and contribute as much as possible to the astrobiology community. It is my goal to someday become an astronaut as well as an AMES research scientist.

Swarna Sinha



**Pennsylvania State University
University Park, PA**

Education and Experience:

If there is anything our generation has in common with prior generations, it is exploration. Part of humanity's essence is to delve into the unknown, find new knowledge, and then create new things using that knowledge. Perhaps this idea struck my mind when I first saw historic videos of the Saturn V launch at the Kennedy Space Center. At the

time, I was an eleven-year-old already walking in with an interest in flight. The picture of that rocket, synthesized from the most advanced technology of that era to overcome gravity with tremendous force, turned interest into fascination.

Pushing limits and taking on challenges are what I like to do the most. I also enjoy mathematics problems and all the struggles that come along with them. At the Pennsylvania State University, I am pursuing majors in aerospace engineering and mathematics.

My prior experience includes modeling power on solar arrays on a cube satellite at the Student Space Programs Laboratory (SSPL) at Penn State. In the summer of 2011, I interned at the MIT Space Systems Laboratory, where I worked on a sensor for a cube satellite as well as a satellite programming competition for middle and high school students. At the end of the summer, we got to see live video transmission from the International Space Station. It was amazing and amusing to see astronauts performing cartwheels across the station.

Throughout the past academic year, I have been studying orbital trajectories for the Lunar Lion, which is my university's entry for the Google Lunar X Prize. Attitude and trajectory control methods are of utmost importance since we are trying to get our spacecraft to reach the Moon.

My ultimate goal is to work on propulsion systems. Although I would love to be an astronaut, I think developing a more efficient, less costly launch system is key to putting more individuals into space in the future. I

**Major: Aerospace
Engineering and
Mathematics**

PI: Dr. Butler Hine

Email: sxs1014@psu.edu

would be happy to have a career focused on opening up space for a greater number of people. For this upcoming summer, I am very excited to work at NASA Ames with such a talented group of scientists and engineers. I hope to learn from everyone there and derive some exceptional memories.

Activities/Hobbies:

I keep myself active by being the secretary of the Penn State International Dance Ensemble (PSIDE), which performs many different dances from all over the world. I am typically excited to do Indian folk dances. I also make it to the Taekwondo Club practices as my schedule permits and am part of the aerospace engineering honors society, Sigma Gamma Tau, at my university. In my free time, I write fiction stories and draw. Naturally, I am short on time, but I would someday like to thread my stories into a book.

When I am not in school, I love to travel and to learn about different cultures. I have been to India several times and studied abroad in China. The best parts of travel for me are learning languages, eating and trying to make ethnic cuisine, and finding historic spots. This summer, I am thrilled to be in California. Since I am from Pennsylvania, jumping to the opposite coast for an extended period of time is a new opportunity to see what's out there.

Chris Teubert



Iowa State University Ames, Iowa

I grew up in Dodgeville, WI with my parents and younger sister. My interest in astronomy and spaceflight began in elementary school where I was fortunate to have the encouragement of my teachers and my parents. The school librarian was always on the lookout for new space books to help fuel my passion. As a small child I would draw the space shuttle and detail how I imagined inner working of the vehicle. In middle

school an essay I wrote about my interest in science and space won me a chance to attend *Space Academy* in Huntsville, Alabama, further stimulating my interest.

Since then I have continued developing my love for space; participating in projects such as NASA's University Student Launch Initiative (USLI) and CanSat. My Junior year, as USLI team captain, we designed and constructed a controlled descent vehicle (CDV). The CDV was released from a rocket at which point the vehicle and its payload were guided to a chosen landing site.

My interests were further explored through my involvement with the Iowa State Space Society (ISSS), the local chapter of Students for Exploration and Development of Space (SEDS). My Junior year, as president of ISSS, I organized rocketry projects, astronomy and outreach events, guest lectures, and our Yuri's Night celebration.

Beginning May 2011, as a Research Assistant with the Asteroid Deflection Research Center (ADRC) at Iowa State University, I was part of an undergraduate team developing an asteroid deflection mission design tool. My research was presented and published at the 2011 AAS/AIAA Astrodynamics Specialist Conference.

I worked as a student intern at NASA Ames Research Center from August to December 2011 as part of the Undergraduate Student Research Program (USRP). During that time, I analyzed plug load data and trends, and developed automated programs using inductive monitoring to monitor and manage electrical loads and system health and published two papers on the

Major: Aerospace Engineering

PI: Dr. Carol Stoker

Email: teubert@gmail.com

subject.

To prepare myself for working in the space industry, I chose classes in Astrodynamics, astrophysics, astronomy, and Spacecraft Systems to better refine my skills. My professors and friends were very supportive in helping me explore my interest in spaceflight. During my final year in college I completed my senior design project as part of a team. We designed a mission to rendezvous with the asteroid RQ36, take a sample, analyze said sample, and transmit the results back to Earth. May 2012 I graduated with a Bachelor of Science in Aerospace Engineering from Iowa State University.

Interests and Hobbies

In my free time I enjoy stargazing with my telescope, reading, cooking, camping, and travelling to new places. My love of travelling began when, in spring of 2009, I studied for one semester at Delft Technical University in the Netherlands. During the 6 months I spent there I had opportunities to explore much of Europe. At the time I start this internship I will have just returned from a two week trip to Belgium and Germany. I have no doubt that I will continue to travel throughout my life.

Future Goals

After my experience at NASA Academy this summer I hope to find a fulfilling job at NASA or in the private spaceflight sector working on the front lines of spacecraft and mission design. I hope to be able to use my passion and experience to make significant contributions to the development of spaceflight.

Ty Trapps



Capitol College

Laurel, MD

Who is Ty Trapps?

I am curious about the world and am always asking “why” and “how”. As a child, my parents nurtured that curiosity with a home library full of books and encyclopedias on everything from exotic animals to anatomy. As I progressed through school, that curiosity and thirst for knowledge grew through participation in science fairs, academic competitions and group projects. Today as a college student, I am exploring how to bridge the seemingly daunting gap between science and art. As a student studying software development, that is a question I must always ask when approaching any project. Art has played a key role in the planning process for many of the interfaces I have built. Beyond the obvious aspects of design, considering the human aspect of how one relates to a machine or application has been a key interest of mine throughout my undergraduate career. I participated in my college’s Robotics Team as a programmer, which has helped address some important human-computer interaction questions I originally had. This summer I will have a chance to explore this topic further as a research associate within the Intelligent Robotics Group at Ames. I am grateful and excited to embark on this new stage of my intellectual journey.

My Interest in Space

NASA has always played a significant role in my life since I was a kid. When I was younger I wanted to be an astronaut just like Mae Jemison, the first African-American female astronaut and one of my idols growing up. When I was ten, my dad started working for NASA Goddard Space Flight Center and brought me to lectures, special events and space camp in Huntsville, Alabama. It was amazing to say the least.

As an undergraduate student, I have taken courses and attended symposiums on space science at my college and have even had the opportunity to meet several former astronauts. I am a member of the American Institute of Aeronautics and Astronautics

Major: Software Internet Applications

PI: Terry Fong

Email: tetra2@msn.com

and have presented a student paper at the AIAA Young Professionals conference at the Applied Physics Laboratory in November 2011. I recently completed an internship at the Space Telescope Science Institute at Johns Hopkins University in Baltimore, in which I worked with the software development team on the Hubble Space Telescope and Amazing Space websites.

Previous NASA Involvement

My journey with NASA began in the summer of 2011 when I became a student intern with the Langley Aerospace Research Student Scholars program at Langley Aerospace Research Center in Hampton, Virginia. As a research intern in the Office of the Chief Information Officer Directorate, I worked with the Chief Technology Officer on a project exploring the future of technology within the space industry. I researched topics pertaining to quantum computing, ergonomics, virtual reality, cyber security and robotics. I presented my findings to the Directorate and submitted a twenty page research paper. I also participated in a center-wide mobile application competition, in which our team of four interns won first place for a Geographic Information System application that utilized existing technology enabling employees to find their way around the campus. I was also selected as a NASA Student Ambassador for the 2012-2013 academic year.

Out of the classroom

I served as president of my college's chapter of the Institute of Electrical and Electronic Engineers and the Capitol College chapter of Out in Science, Technology, Engineering and Math, both for the 2011-2012 academic year. I also am a member of my college's Green Club (environmental awareness club) and am a tech volunteer at Foundry United Methodist Church in Washington, D.C. Some areas of interest include technology, computers, film, poetry, media, sports and fitness, organic/holistic lifestyles, campus diversity, religion and theology.

The Journey Ahead

I will graduate with my Bachelor of Science degree in software internet applications with a minor in information assurance May 2013. Upon graduation, I hope to seek a full-time position ideally in the space industry as a software developer or user interface designer. In addition, I am considering graduate studies in human-computer interaction.

Reasons for NASA Academy and Summer Expectations

I decided to apply to the NASA Academy because I wanted to experience an intellectual challenge that would better prepare me for a career in computer science. While I have been blessed with the opportunity to participate in remarkable internship programs, I knew NASA Academy would be the perfect

way to cap off my undergraduate career. The academy will challenge me intellectually, emotionally and mentally and will give me more exposure to working in team environments. I am aware of the history of success academy graduates have had in the Science, Technology, Engineering and Mathematics disciplines and I am honored to join their ranks. This summer I hope to walk away with practical hands-on technical knowledge and also an amazing professional and social experience that will better prepare me upon graduation.

2012 Staff Profiles



**Stanford University
Stanford, CA**

My interest in space started in 7th grade when my science teacher showed us a poster that depicted space in a series of expanded images. A point on the picture of the universe expanded to show the Milky Way galaxy, a point in our galaxy expanded to show our solar system, and a point in the solar system expanded to show the Earth. That poster

showed me that I couldn't possibly begin to grasp how enormously big space really is, and I got so excited that there was just so much more to know. As a result, I pursued a career in space exploration from that point on.

I received my B.S. in Aerospace Engineering at UCLA and M.S. in Aeronautics and Astronautics at Stanford University, where I learned about the NASA Academy and applied. As a participant in the 2011 Ames Academy, I worked on the Lunar Atmosphere and Dust Environment Explorer (LADEE) with Dr. Butler Hine. Throughout the summer I completed a study on the decommissioning phase of LADEE and the probability of impacting the lunar surface within 15 kilometers of an Apollo site. After the Academy, I continued to work on LADEE part time while I finished my Master's degree. Since completion of my degree in March 2012, I have been continuing to work on the LADEE Flight Dynamics team. We are currently training for Mission Operations and testing the Flight Dynamics System for use during Mission Operations.

After staffing the 2012 Academy this summer, I look forward to working full time on LADEE at Ames.



Program Coordinator

Aeronautics and Astronautics

Email: arlenkam@gmail.com



**Rose-Hulman Institute of
Technology
Terre Haute, IN**



Michael Zero

Education and Experience:

My interest in aeronautics has been growing since I was a child, but my commitment to further understand the field was solidified in the summer of 2006.

I participated in a service trip in Kenya, Africa and spent several hours watching airplanes take off and land and spent several more hours flying. The sensation associated with these experiences has since been unparalleled in my life and the quest to learn more about aeronautics has taken off.

My undergraduate education was spent at Rose-Hulman Institute of Technology in Terre Haute, Indiana. Challenging courses and high expectations constantly push the students to improve their technical knowledge and work ethic. As a mechanical engineering major, I spent a majority of my time honing my teamwork abilities while tackling unique projects. Group projects helped me discover a passion for leading and technical documentation. I respect the power of a collaborative effort and yearn to inspire and motivate as a project manager in the future.

My first bout with the NASA Academy was the culmination of several years of sleepless nights spent studying and advancing my skill set. As soon as I was introduced to the program, I was convinced that it was the perfect opportunity

Program Coordinator

Mechanical Engineering

**Email:
Michael.j.zero@gmail.com**

for some of the brightest minds that our colleges have to offer to grow and develop. My main goal throughout the summer was contributing to the team in a meaningful way and completely immersing myself in as many new experiences as possible. Having completed the internship, I was incredibly appreciative of the staff and desired to leave a positive impact on the next Academy. I will do everything in my power to assure that the summer experience is wholly beneficial and

positive because I have a genuine desire to give back to the program that helped me grow so much.

Interests:

My passion for academics is only matched by my passion for running. I have been a member of cross country and track and field teams since seventh grade. While I may not be the most talented runner, I truly appreciate the camaraderie inherent to the sports. My experiences building tightly knit running teams have affected the manner in which I approach any group work. So long as a common goal exists among passionate individuals, it's easy to be surprised at the outcome of effort.

NASA Ames Research Center

Doug O'Handley is returning for the 15th year with the NASA Ames Academy. He retired from NASA after 40 years in government and academia in 1999. He is currently employed by Lockheed Martin to continue his activities with the Ames Academy. He teaches at Santa Clara University in the Physics Department.



Douglas O'Handley

Doug has an AB degree in astronomy from the University of Michigan and a Masters of Science and Ph.D. in Celestial Mechanics and Computer Science from Yale University.

Upon graduation from the University of Michigan, Doug was employed with the Time Service and Nautical Almanac Offices of the U.S. Naval Observatory, Washington, D.C. After graduation from Yale University, he joined NASA's Jet Propulsion Laboratory and carried out research in celestial mechanics in support of the early Mariner missions to Mercury, Venus, and Mars. He took the challenge to enter management and led research in artificial intelligence and biomedical technology.

After a brief period as staff in the Director's Office at Ames, Doug returned to southern California to work in the private sector at TRW in Redondo Beach. In 1988, he joined NASA Headquarters as the Deputy Assistant Administrator in the Office of Exploration. This was at the period of planning and the announcement of the Space Exploration Initiative by former President Bush to place humans permanently on the Moon and venture on to Mars early in the 21st century.

**Emeritus Director for the
NASA Ames Academy for
Space Exploration**

**Email:
douglas.a.ohandley@nasa.gov**

Returning to Ames in 1992, Doug joined the space Sciences Division in the Space Directorate.

He is a consultant with Orbitec in Madison, WI. The results of a lunar study carried out with Orbitec can be found at <http://www.niac.usra.edu/studies> under O'Handley.

Doug is a Fellow of the Royal Society of Medicine, a Fellow in the Aerospace Medical Association, a Fellow of the American Astronautical Society, and an Associate

Fellow of the American Institute of Aeronautics and Astronautics. In addition, he is a member of the International Astronomical Union and the International Academy of Astronautics, and the American Astronomical Society. He chaired, for 10 years, the Space Exploration Committee of the International Astronautical Federation.

Christy, his wife, and Doug will be spending more time in Tahoe this summer but will get to know all of you personally. You always are welcome at either of our place in Morgan Hill or Lake Tahoe. You have become part of our extended family by your selection to the Ames Academy.

NASA Ames Research Center

Brad received his B.S. in physics with minors in optics, chemistry and Japanese from Rose-Hulman Institute of Technology. From there, he received his M.S. in astrophysics from New Mexico Tech where he used the Very Large Array (VLA) to qualitatively analyze spectra from pulsars. After working for 2 years at NASA Ames as a hardware engineer for the International Space Station, Brad went back to graduate school at Scripps Institution of Oceanography in San Diego where he got his PhD in marine microbiology and geochemistry. In addition to being the Director of the NASA Academy, he also acts as the senior scientist for the NASA Lunar Science Institute.



Brad Bailey

In 1998, Brad was accepted into the NASA Ames Astrobiology Academy where he worked with PIs Lou Allamandola and Doug Hudgins on the spectroscopic determination of polycyclic aromatic hydrocarbons in the interstellar medium. He enjoyed the Academy experience so much that he came back in 1999 to work as a staff member for the Academy.

With his varied scientific background, Brad will be a good contact and resource for students looking to break into new fields of interdisciplinary science or for graduate school advice. The academy was a life changing summer experience for Brad as he would guarantee that he would be working at an optical plant as an engineer in Albuquerque, NM without the experience and contacts that the Academy gave to him. Brad is excited to give back to the Academy in this capacity and is looking forward to meeting all of the Research Associates when they arrive in June!

**NASA Lunar Science
Institute Staff Scientist and
Deputy Director for the
NASA Ames Academy for
Space Exploration**

Email: brad.bailey@nasa.gov

Kristina Gibbs



NASA Ames Research Center

Kristina Gibbs is the Deputy Program Manager for the Academy and the Lockheed Martin Manager overseeing the Academy's daily operations. In addition to this task, Kristina manages support for other NASA organizations including the NASA Astrobiology Institute and the NASA Lunar

Sciences Institute. Kristina also has the responsibility for strategic planning and hiring the Academy staff and drivers.

Until recently, Kristina has been working for Lockheed Martin in support of NASA Ames Life Science Payloads for over 15 years. She first started as a liaison between NASA and the Principal Investigators of the Mir / Shuttle payloads, working collaboratively with Russian Researchers. From 1999 to 2002, Kristina was the Project Scientist for two of the first life science payloads in the ISS. As the first Lockheed Martin employee to manage a NASA payload, Kristina facilitated microbiology hardware development and flight operations. Kristina has supported over 10 Mir, STS and ISS payloads and over 20 Principal Investigators . Just over a year ago Kristina was appointed as Manager to the Lockheed Martin Institutes and Collaborative Technologies section.

Kristina is looking forward to your arrival and working with you this summer.

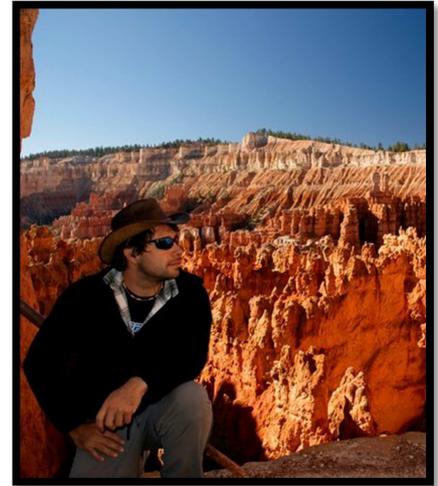
**Section Manager for Lockheed
Martin and Director for the NASA
Ames Academy for Space
Exploration**

Email: kristina.gibbs@nasa.gov

NASA Ames Research Center

My history with NASA began in 1996 as an undergraduate at the University of Florida, developing means to analyze & broadcast Jovian Decametric Radio emissions at the UF Radio Observatory. Through funding from the Florida Space Grant Consortium and NASA's RadioJOVE & INSPIRE projects, I developed the first ever internet audio streaming of radio astronomy observations.

As a child, I had always loved Astronomy and had dreamed of being an astronaut; so I thought, why not study space itself!



In 1997, astronaut Dr. (and USAF Col.) Cady Coleman suggested I reconsider my path given that most astronauts don't study astronomy while in space. I met Dr. Coleman at UF after a presentation on a mission aboard Space Shuttle Columbia, STS-93. One of her goals was to work on a UF professor's genetically modified *Arabidopsis thaliana* plants for the first molecular biology experiment performed in space. After waiting in line, Dr. Coleman convinced me to consider choosing a major involving plant biology. The very next day I selected Environmental Horticulture; the art and science of cultivating plants in unnatural habitats.

My interest in both astronomy & biology strained the internet's first search engines. Before Google, I still was able to discover the budding field of Astrobiology, and in turn the NASA Ames Academy. I was so intent on entering the Academy that I continued to apply after two rejections. It was not until my

**Exploration Solutions, Inc.
Winter Park, FL**

**Alumni of the 2000 Ames
Academy**

**Email:
matthew.reyes@nasa.gov**

third try that Dr. Douglas O'Handley finally accepted my application for the 2000 NASA Ames Astrobiology Academy, affectionately known as NAABA2k. I worked with Dr. Jeffrey D. Smith on studying *Arabidopsis thaliana* morphology & starch production in hypergravity. Immediately after the Academy, Lockheed Martin hired me to complete the project over following months.

In 2001, I returned to UF for graduate studies of Plant Molecular & Cell Biology in the same laboratory that developed Dr. Coleman's plant space biology experiment. Under Dr. Robert J. Ferl's supervision, I

Matthew Reyes

studied the biochemistry of starch synthesis and the molecular evolution of protein-protein interactions.

Dr. Ferl also provided me opportunities to work plant molecular biology experiments in microgravity 49 aboard NASA's KC-135, the "Vomit Comet". My intent was to graduate with a Master's degree and work at Kennedy Space Center, however, the 2003 Columbia disaster ended the funding, and my dreams of working in space life sciences at NASA.

In 2004 I was contacted by Loretta Hidalgo through the NASA Academy Alumni Association mailing list about a chance to work for the ZERO GRAVITY CORPORATION: the world's first publicly available microgravity flight experience. The opportunity was irresistible, and in 2004 I suspended my graduate work to eventually become ZERO-G's Director of Technical Operations. With ZERO-G I had been a participant on over 100 flights, oversaw hundreds of educator, research, and tourist passengers, and helped produced and/or appeared in nearly a dozen TV commercials & shows , including the Mythbusters and the feature documentary: "Inspire Me: Weightless Flights of Discovery".

The educational aspects of my work with ZERO-G compelled me to start my own education outreach company, Exploration Solutions, Inc. Through Explorations Solutions, I have worked as a freelancer on a wide variety of education projects of through video & social media. The highlights of my work with Exploration Solutions happened within precisely 6 months of each other, taking me to the oldest landmass on Earth to the newest volcanic rocks to rise from the ocean.

In July 2007, I worked with astronaut and ISS Expedition 10 Commander Leroy Chiao and NASAWATCH editor Keith Cowing at the Houghton Mars Project Research Station in the Canadian high Arctic. While there, Leroy, Keith & I developed webcasts for children viewing our activities at several Challenger Learning Centers across North America. In December of the same year, I worked in the Galápagos Islands, Ecuador with Rollins College and the US non-profit Galápagos ICE: Immerse, Connect Evolve. In service to Rollins college and it's students, I produced videos that highlighted their activities educating the local Galápageños skills in English, health, and the principles of environmental conservation.

Matthew Frederick Reyes is my full name, though as a result of there being multiple Matthew's in the NASA Academy program, Señor Reyes was the moniker of choice by my Academy brethren. Throughout my adult life I have also worked as a motorcycle mechanic and have ridden thousands of miles upon my pair of Suzuki cruisers. Thus my other nickname is "motorbikematt", which a quick Google search will find more details than I even remember.

NASA Ames Research Center



Desireemoui Bridges is the Program Coordinator for the NASA Ames Academy for Space Exploration. Desi has had a hand in coordinating all the operational needs of the 2010 and 2011 Academies. She gets things done efficiently and with minimal collateral. Desi is available to help you and the staff with any logistical issues.

Desi joined Lockheed Martin three years ago as an administrative assistant. In addition to working with the NASA Ames Academy for Space Exploration, she is supporting the NASA Aeronautics Research Institute and working as a purchasing liaison for Lockheed Martin. Prior to working with us, Desi was employed as a funding specialist and software tester in the mortgage industry.

Desi looks forward to working with all of you.

Purchasing Support for Lockheed Martin and Program Coordinator for the NASA Ames Academy for Space Exploration

Email:
desireemoui.r.bridges@nasa.gov

Desireemoui Bridges