NASA Ames Academy for Space Exploration

2009

Academy Profile Book
Ames Research Center
Moffett Field, CA

NASA Ames Academy for Space Exploration
2009 Profiles

Table of Contents		2
Introduction		3
Contact Information		6

Research Associates

Carolyn Belle	Colorado	8
Michael Berger	California	10
Nicholas De Leon	Alabama	12
Heather Duckworth	New York	14
John Ferreira	Florida	16
Jake Gamsky	Kentucky	18
Dustin Kendrick	Massachusetts	20
Sophie Milam	Hawaii	22
Takamasa Naiki	Japan/JAXA	24
David Ottesen	Texas	25
Laura Simurda	California	27
Joseph Starek	Michigan	29

Staff

Anita Mantri	32
Matthew Reyes	33
Carol Russo	35
Douglas O'Handley	36
Kristina Gibbs	37
Brad Bailey	38
Liza Coe	39

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 50-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.

The NASA Academy at Ames

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.

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 discipline 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 hand picked 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 14th – August 21st

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 just outside the main gates of NASA Ames' Research Park. Transportation will be provided each day.

We plan several trips on the weekends. These include 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 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 10 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 (minimum)

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)

Contact Information

NASA Academy information is obtained through these sources:

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

http://academy.arc.nasa.gov

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Brad Bailey

NASA Ames Research Center

17-1

Moffett Field, CA 94035

2009 Research Associates

Carolyn Belle

Colorado College

Colorado Springs

Biology

Bachelor of Science, May 2009

PI: Leslie Prufert-Bebout

Project: Charting the History of Earth's Earliest Microbial Ecosystems

Email address: Carolyn.belle@coloradocollege.edu

Summer vacations spent at my grandparents' farm in Iowa provided an opportunity to see the stars unhindered by city lights; as a child, the opportunities afforded by space seemed endless. Today, these opportunities have only expanded in scope. I cannot begin to fathom the discoveries and technological innovations that will impact the trajectory of space research and the perception of life that will take place during my lifetime. I am excited to participate in this search for greater knowledge of our world, and by the prospect that my future career might change directions several times based on new discoveries and developments.

I am currently studying at Colorado College in Colorado Springs, pursuing a degree in Biology with a minor in Chemistry and a focus in International Affairs. The liberal arts curriculum has allowed an exploration of my interests outside of science, and I thoroughly enjoyed a semester spent in the Netherlands in the spring of 2009. I am currently active in Girl's Day in the Lab, a community service group that focuses on inspiring middle school girls to pursue both a college education and a career in science. This activity has shaped an interest in teaching towards the latter stages of my career. Beyond the walls of Colorado College, I volunteer for Court Appointed Special Advocates, a group that supervises visits between children and their non-custodial parents. I am also involved with the Catamount Institute, a non-profit organization dedicated to inspiring ecological stewardship in the next generation of Americans.

I hope to complete a Ph.D. in evolutionary biology with a certificate in astrobiology. The pursuit of studies in evolution unites my two primary academic interests: biology and history. An engaging cell biology class focused my interest in evolution more specifically onto the study of astrobiology; we explored the progression from the earliest Earth cells to those that currently dominate the planet. I am fascinated by how this progression was interrelated with contemporary

changes in the natural environment. I plan on spending my career in research into the stages of early life on Earth and what this might indicate about the potential for life on other planets. I anticipate that the NASA Ames internship will be a fun and rewarding summer, as well as the next exciting step in my education.

Michael Berger

University of CA - Berkeley

Berkeley, CA

Chemistry

Bachelor of Science, May 2010

PI: Pete Worden and Alan Weston

Project: Low-cost NEO Sample Return Mission

Email address: mberger4@gmail.com

Internships have been an integral part of my academic life since junior year of high school, when, after my first internship, I realized at once their immense potential to enhance my overall educational experience and prepare me for a career in the sciences and engineering.

After my second successful year with my high school's robotics team, a mentor offered me a part-time internship in R&D at his company. Thus began my work at Tru-Si Technologies, where I was given a small project in which I could apply the design intuition I gained as an avid model aviation hobbyist and member of the robotics team. After a few months of diligent effort, our work resulted in two patents. Although I did not notice the changes at first, I returned to the team more open to new ideas, more fluent in explaining mine, and with relevant experience outside of the team.

That summer I interned full-time at the Stanford Linear Accelerator Center (SLAC) in a group that focused on molecular biology. I realized for the first time how rich a resource evolution's readymade creations are to scientists and engineers as an endless source of ideas and inspiration. I saw firsthand how knowledge of the intricacies of protein folding and function aided our research group in trying to mimic biological macromolecules in the quest for improved medicinal drugs, not just by providing constructional clues but also by suggesting complementary structural features. I now carry this mindset with me everywhere, from the physics classroom to the drawing board, where I applied my robotics skills to put together a plan for automating the last manual step in a long chain of protein structure determination steps,

resulting in yet another patent application. Realizing the success of my multidisciplinary approach, I began to see just how intertwined the sciences are with one another and with engineering. This internship helped shape how I think and changed the direction I want to take my education.

Having enjoyed the novelty of working in a new field with each internship and the multidisciplinary problem-solving approach it was developing, I was eager to begin the following summer at DayStar Technologies as a process intern, working on the science behind solar electricity generation. There, theoretical chemistry, physics, mathematics, and engineering coexisted in such harmony that my supervisor would lecture on quantum tunneling and not even question its relevance, and interns were expected to know band gap theory even though the specialist sits two cubicles away. Working in such an environment helped me further define my interests; I realized that I am interested in science not just as a means of satisfying my curiosity but rather guiding our efforts to improve the human experience. Thanks to DayStar, I better understand what I want to achieve in life and am better equipped for the journey.

In light of this understanding, I plan to integrate as many diverse courses into my undergraduate education as possible, both from the sciences and from the humanities. I feel this academic breadth is essential for understanding the purpose of our existence as humans and as a society, and thus aiding in the socially and politically correct application of science and engineering – not for warfare, but for space exploration; not to add chores, but to add free time to the daily schedule; not to make our air filthier, but to leave it cleaner than we found it. These are my tentative goals and attending the Ames Academy will allow me to work alongside the best professionals to develop them further, gain insight from a new perspective, and make for a most fulfilling, memorable summer.

Nicholas De Leon

University of Alabama

Huntsville, AL

Materials Engineering

First Year Graduate School

PI: Bill Warmbrodt and Larry Olsen

Project: Advanced Rotorcraft Aeromechanics Research

Email address: ndeleon@bama.ua.edu

I was born on June 15th, 1987 in Brooklyn, New York as the eldest son of Arnie and Adriana De Leon, El Salvadorian and Colombian immigrants respectively. My dad harped on many things, but I am going to say that having an insatiable yearning for learning was the most influential. This translated to my parents nurturing my curiosity by providing me with the tools of discovery. We were of the first wave of people owning a computer. I was brought into a house that already had the beloved DOS green screen that later was replaced by Windows on a Gateway. The only programs we owned were educational in nature and I didn't want it any other way. My favorite was the Space and Astronomy program. It was also on my first vacation that I can remember that we visited Disneyworld, and more excitingly, Kennedy Space Center. There was a definite trend in my interests developing.

I am a New Yorker at heart and life long Mets fan. So, when my parents decided pick up and move to the southernmost of NYC's boroughs, South Florida, I was not a happy camper. At that point I was a shy and timid fifth grader, but that was about to change. I finished fifth grade in Coconut Creek only to be graduated to a different Middle School, then moved to another Middle School, and then, getting placed into the gifted program, changed all my classes and obviously classmates. That was all in the course of 2 years. I learned that in those conditions, timidity is not effective. I became extremely outgoing and social, and remain so to this day. I make it my daily mission to meet new people and try to bring or maintain a smile on others faces and my success is partially evidenced by being voted class clown in high school.

By the time high school did roll around, my head was in the clouds. Aviation and being a pilot were my new fascination. I joined my school's Air Force J.R.O.T.C. and took private pilot classes, though, as the common story goes, my poor vision dashed my chances of being a fighter jet pilot. The next step in that story is also common: replacing splitting the sound barrier in the sky with experimenting in labs; I thought I wanted to be an Aerospace Engineer. Now, finally, my own story starts to differ from the norm. In a leadership camp over the summer of my junior year, I traveled to Georgia Tech. It was here where I found my future career, how I wanted to make my contribution. The professor of the Materials Science department was having trouble keeping the all cadets' attention, besides mine. With his ignited torch, he flamed a space shuttle tile for a moment and then handed it directly to me. I was astonished to feel that it remained completely cool. He told me that this is what materials scientists do and I was on board.

Always wanting to try and experience something new and different, I decided to risk my yankee skin in the Deep South by accepting an offer at The University of Alabama. I could not have made a better decision, and opportunity has been the name of the game since. One of those opportunities was landing an internship for two summers in the industry of my dreams. I worked in the Materials and Processing group at United Launch Alliance, the provider of reliable heavy space access to NASA and other government agencies. My complete and continued enthusiasm with ULA confirmed that I am walking the right path. The path that has afforded me admittance to the 2009 Ames Academy, and the opportunity to use not only my metallurgical and materials science knowledge, but my social fluency as well to contribute to man's quest for the stars.

Heather Duckworth

Columbia University

New York, NY

Astrophysics

Bachelor of Arts, May 2010

PI: Peter Jenniskens

Project: Airborne and ground-based observations of natural and artificial meteors

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Ever since I attended the Educational Program for Gifted Youth Summer Program at Stanford University on Einstein's Theory of Relativity, I have had a passion for astronomy and cosmology that is endless and ultimate. At Stanford, I studied special and general relativity and visited the Stanford Linear Accelerator (SLAC). The visit to SLAC opened my eyes and inspired me to pursue my deep rooted interest in Astrophysics. I have continued to follow my academic curiosity and have not stopped learning since years ago. Soon after my journey at Stanford, I continued on to Harvard to take more astronomy courses over the summer. Here I was able to work with telescopes and astrophysics software with labs and stimulations. I was able to experience a taste of the NASA world at Harvard through a few hands on projects. Those experiences at Stanford and Harvard led me to the next step of my journey.

Finally, I have landed at Columbia University and yearn for more every day. This past summer, and currently, I worked on a NASA funded project at Columbia University called GALEX under Professor David Schiminovich. I taught myself how to write computer programs using the Python programming language. This experience unveiled a whole other aspect of astrophysics that I had never seen. I spent days on end perfecting Python programs that graphed thousands of data points, matched 125,000 GALEX images with the low-z catalog from Sloan Digital Sky Survey, separated NUV and FUV data from large fits files, and much more. This Spring I worked to put together a catalog of recently accumulated GALEX data that will soon be released to the public. Working with GALEX has made me realize the incredible impact that astrophysics has on our lives. In addition, I recently took a trip to Kitt Peak and the Keck Telescope in Tuscon, Arizona to work with the 1.3 and 2.4 meter MDM telescopes. I worked with spectroscopy and photometry software to gather data on different types of stars.

My strongest areas of interest are cosmology, black holes, relativity, and quantum mechanics. Following my BA in Astrophysics, I hope to go to graduate school and someday work in the astrophysics world in some capacity at NASA. On top of my research experience last summer at Columbia working with GALEX data, looking into the research and experimental world at NASA will more clearly help me understand how my astronomy education is applied. In Stephen Hawking's words, "I could be bound in a nutshell, but still count myself a King of Infinite Space." I strive to be that King of Infinite Space, well I guess Queen in my case, and one day, my drive and dedication, as evidenced in my eight years of interest in astrophysics and space will lead me to my goals.

Extracurricular Interests: I am also a professional dancer, performing as a Radio City Rockette. In addition to my passion for science, I am a dancer, singer, and actress. I have performed in musical theatre since I was young, and have danced since age three. I was nominated for 2 AriZoni Awards for Best Supporting Actress. On top of dancing, I have also choreographed children's productions, attended All-State Choir, and attended the Interlochen Arts Camp for 2 summers as a flautist.

In addition, I have had immense involvement with the American Cancer Society. My mother is a two-time breast cancer survivor. And so, I have been fundraising for the American Cancer Society since I began high school in 2002. I have been Team Captain for Relay for Life, an American Cancer Society fundraiser, for 6 years. Last year, I served on the planning committee for Relay for Life at Columbia University. Also, in 2004, I began a club at my high school called Wolves Pride Against Cancer where I served as Founder and President for two years. In addition, I directed and choreographed a fundraising performance called "Cured: An Upbeat Musical Review." Total, I have raised over $7,000 for the American Cancer Society. This leadership opportunity not only helps the American Cancer Society, but also gives hope to my mother that one day there will be a cure.

John Ferreira

Florida Institute of Technology

Melbourne, FL

Physics and Space Sciences

Bachelor of Science, May 2009

PI: Chris McKay

Project: Life on Mars: Past, Present and Future

Email address: jferreir@fit.edu

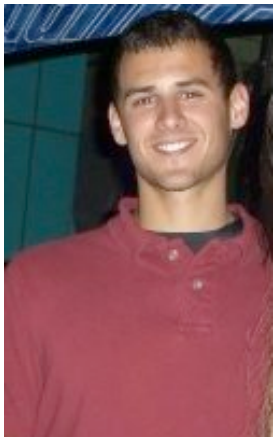
Education and Experience:

Ever since a young age I knew I wanted to participate in space exploration. This drive is what has led me to be involved in many of the opportunities that I have had in my life; from participating in Space Camp many years ago, to my academic bias towards math and the sciences in high school. This was also the prime factor in my decision to attend the Florida Institute of Technology for my undergraduate research. Since arriving here at FIT I have had many diverse opportunities. I worked at Kennedy Space Center for the Florida Space Research Institute during the summer 2006, involved in research concerning the Peaks of Eternal Light on the moon, the possibility of water being located in the area, and other factors that should be considered for possible locations of a lunar outpost. During this time I also helped coordinate part of the effort with the European Space Agency to observe the SMART-1 lunar impact from different locations in the USA. During the 2006-2007 school year I worked with professors at my university to investigate possible connections between cosmic rays and lightning initiation. Since that time I have helped carry on research with a different professor on two different projects tied into KSC current research. First, I helped with the coding for a camera system that will be installed on the ISS, and then investigating the electrostatic properties of lunar regolith, in conjunction with Mars and Lunar soil research being done in the Space Life Sciences Laboratory at Kennedy. These experiences have all helped solidify my interest in working on areas involved with manned space exploration, which led me to the NASA Academy program at Ames.

Interests:

When I'm not studying or working, I try to enjoy doing one of my hobbies. I love music and play with my school's pep band as well as several community bands. I'm also a big fan of performing arts, and help out with my school's theatre troupe, as well as perform with the associated improv group. I'm involved with the SPS and SEDS chapters of my school, and am part of a couple of student-only research groups.

Jake Gamsky



Georgetown College

Georgetown, KY

Physics

Bachelor of Science, May 2010

PI: Friedemann Freund

Project: Lunar Dust, its surface properties and potential toxicity

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As a young child, I have memories of looking up at the dark night sky and wondering about the vast opportunities for exploration and scientific discovery that it beholds. However, it wasn't until my sophomore year of undergraduate study that I learned about the complex laws of physics and the origin of the universe that I looked up into that same night sky, still full of amazement and wonder and thought about the intricate mathematics and physics that took place in the cosmos.

These thoughts led me to pursue a physics degree from a small, liberal-arts school called Georgetown College in Kentucky. Upon arriving at Georgetown College on an academic/athletic scholarship, I soon realized and appreciated the fact that there were only two physics professors in the entire faculty (and only a handful of physics majors). I was completely fascinated in the fact that almost everything in the universe can be explained or discovered using mathematics. I plan to continue my education and pursue Masters and Doctoral degrees in related scientific fields.

In addition to studying physics, I began the quest to learn more (outside of what my small college had to offer) of how these concepts affect the world around me. This quest led me to NASA. I was fascinated with our country's accomplishments and wanted to be apart of this unique organization. In the summer of 2008, I knew I wanted to devote my career path to the possibility of becoming an astronaut, someday returning to the lunar surface or being a part of a Mars endeavor.

My passion to study, explore and learn from some of the most brilliant minds in the world led me to an NASA internship at Kennedy Space Center in the spring of 2009. This

internship provided me with an incredible research and life-experience opportunity. I conducted research with Dr. Philip Metzger into the properties and compaction of lunar regolith in the permanently shadowed craters of the moon. The regolith in these regions does not undergo the same thermal cycling that the other parts of the moon experience and the properties of the regolith in these regions differ. These permanently shadowed regions are targets of high scientific importance and as a result of my research we have learned that it is imperative to investigate the density of the soil in the permanently shadowed craters so that excavating, roving, and landing exchanges, along with the energy budgets and utilization schedules for related technology, can be scaled and designed correctly. I also preformed a number of experiments to simulate lunar geology and conducted path finding research into exhaust plume interactions with varying densities of granular materials. From this job experience I enhanced my research abilities, leadership skills, and communication proficiency. The spring of 2009 has cemented the fact that one day I hope to live and work in the vast, dangerous, vacuum of space.

While interning at KSC I organized a number of social event for interns and co-ops to participate in, such as Disney World trips, scuba diving certification classes, and baseball games. In addition, I wrote articles for the monthly newsletter and participated in a public speaking club.

Interests

At Georgetown College I was a baseball Academic All-Conference selection and participated in a number of intramural sports (basketball, football, volleyball, ultimate Frisbee). Baseball, however, has been a part of my life ever since I was a young boy when my Dad coached my tee-ball teams. I eventually grew to love the game and started playing for the high school team in 8th grade. My senior year of high school, I was the team captain and led my school to a district championship.

I also enjoy reading, running, playing golf, weight lifting, swimming, video games and listening to people tell of the unique experience and benefit of dedicating their lives to space exploration. I am scuba certified and would like to go on more dives. I plan to acquire my pilot's license in the future.

I was inducted into the Alpha Lambda Delta honor society my freshman year. This is an organization for freshmen who have shown unique abilities and passion in the first year of study. I am currently in the process of transferring to a larger university (University of Kentucky) where I hope to lead a research team on a reduced gravity flight.

I look forward to my semester here at NASA Ames and the extraordinary research, leadership, and teambuilding opportunities this unique and selective program offers.

Dustin Kendrick

Massachusetts Institute of Technology

Boston, MA

Aero/Astro Engineering

Bachelor of Science, May 2010

PI: Butler Hine and Will Marshall

Project: Lunar Spacecraft Development

Email address: dustink@mit.edu

Education and Experience:

When I was little, my grandfather used to regale me with exciting stories of his flight exploits as both an airplane and helicopter pilot in the Army Air Corp. As I got older and read about fascinating planes like the SR-71 and F22 I got more and more interested in this whole heavier than air flight concept. What really got me excited, even more than the planes, was when I read or heard about the newest space exploration mission. After a while, I realized that I could work on that stuff for a living.

In order to fulfill that dream, I've been attending the Massachusetts Institute of Technology (MIT) for the past 3 years and studying Aeronautical/Astronautical Engineering. If all goes as planned, I will graduate in June of 2010 with my Bachelor's degree. At this point, I will probably pursue a Master's degree and then get a job, but nothing is set in stone. My education at MIT has given me many unique opportunities to explore the world of Aerospace. This past semester I was in a class that was working in conjunction with one of the Google Lunar X-Prize groups to develop an earth-based proof of concept prototype of the actual Lunar Hopper Vehicle. Beginning last summer, and continuing through this year, I worked on the Mars Gravity Biosatellite Project at MIT, in which the goal is to send a satellite containing live mice into orbit around the earth. The satellite will spin to simulate martian gravity in the habitats in order to study the physiological effects of reduced gravity on mammals. In working on this project I have gotten to experience a variety of important areas and disciplines in Aerospace Engineering. This year I had the opportunity to design and build an experiment that will fly in a

ZeroG Parabolic research flight to validate some of the mouse habitat modules in different gravity regimes.

Extra-Curricular Activities:

In what spare time I have I enjoy doing a variety of things. I am a member of MIT's varsity hockey team, and I play a bunch of other intramural sports with my fraternity brothers. I also enjoy reading, backpacking and other outdoor activities. I like to be active when I can. I'm also the Teen Program coordinator for the MIT chapter of Camp Kesem, which offers children whose parents have cancer with a free, weeklong camp each summer. Finally, I am currently the Vice President of my Fraternity, and I get to oversee all the officers involved in the day to day running of the house. All these things have taught me leadership and teamwork, which I hope will help me to be a valuable member of the Ames team this summer.

Sophie Milam

University of Hawaii - HIlo

Hilo, HI

Astronomy

Bachelor of Science, May 2010

PI: Nathalie Cabrol

Project: Mars: Past and Present Habitability

Email address: smilam@hawaii.edu

Education and Experiences:

I grew up in San Antonio, Texas where in January of 1990 the space shuttle Columbia spent a night on its way from California to Florida. I was about a year and a half old and my mom had taken me and my brothers to see the shuttle on the back of the airplane that was taking it across the country. Despite the fact that I can't remember any of that fateful day I like to think of it as the beginning of my love of space travel, and since before I can remember I've wanted to be an astronaut.

Growing up in Texas with 3 brothers and parents that loved the outdoors I don't ever wonder how I became a tomboy. I've played soccer for 15 years and I don't think I would have made it through the school years so easily without its excitement and distraction. While soccer dominated the school year for me and my brothers, our summers were always filled with hiking, camping, beach trips, and canoeing to which I contribute my love of exploration and adventure. It's been those same feelings that took me to Space Camp when I was 17 and Hawaii when I decided on a university to further my understanding of the natural sciences and mathematics. Not that applying to college was easy; my experience at Space Camp solidified my desire to be an astronaut but it also made me realize that there were many roads to that dream and that they were all very difficult.

There were no colleges or universities that offered majors in Astronaut-ing or Space Exploration and so I had to decide if I wanted to take a general approach and study physics and astronomy to understand the basic properties and conditions of the solar system or a more

specific approach that focused on engineering to construct space ships for NASA. My acceptance to the University of Hawaii at Hilo made my decision for me because it is in the best location, is a nice cozy size, and offers the most hands on undergrad astronomy program in the world. So I opted for sun, surf, and a fundamental but thorough understanding of physics and astronomy.

However, that's not all UH Hilo offered me. In the second semester of my sophomore year I became the Pacific International Space Center for Exploration Systems' (PISCES) office clerk. In November of 2008, my junior year, we hosted NASA, the Canadian Space Agency, and members of the European Space Agency in a Lunar and Martian analog field test of rovers and ISRU systems among other things. Clerically I helped in the organization and communication set up of the field test to be conducted in a valley about 8500 ft up Mauna Kea. During the test some students and I made up the support team, designated with setting up, clearing, and breaking down the site as well as doing whatever the various teams needed done for their specific tests. I am looking forward to taking a larger role in the upcoming test PISCES is planning.

During my participation in the November field test I met many NASA officials and it was through them and my employer, John Hamilton, that I learned about the NASA Academy at different centers around the country. I'm so excited about having the opportunity to work with members of NASA studying the things that have driven my academic career my whole life.

Fun and Relaxation:

I love doing anything outside while I was raised on hiking, swimming, camping, and canoeing, Hawaii has offered me other opportunities I have accepted with gusto. Waterfall climbing, cliff jumping, cave diving, surfing, sun bathing, star gazing and snorkeling are just some of the activities Hawaii has allowed me to add to my repertoire as well as providing new venues for previous favorite activities. There is so much beauty on this island it never ceases to amaze me despite the familiarity of some places. When I'm not out and about I like cozying up with a good book or movie or playing board games with friends. Hawaii has taught me the importance of slowing down to realize your goals and find the best road to them. I have no doubt that this internship is the start of a great road whose destination will find me comparing footprints with Neil Armstrong and making some great leaps toward Mars.

Takamasa Naiki

University of Tokyo

Tokyo, Japan

Electrical Engineering

First Year Graduate School

PI: Robert McCann

Project: Intelligent Spacecraft Human Interface Systems

Email address: naiki@nnl.isas.jaxa.jp

Education and Experience:
Since I was little, I have been interested in mathematics and science. I majored in the department of electronics after graduation from junior high school, and I studied electrical engineering focusing on the electronic circuit and the foundation of programming languages, such as an assembly language and the C language, etc. for five years.

From there, I majored in electronics in the university and increased my knowledge of the electronics and electrical engineering. In my graduate research, I studied image processing using cameras and learned the application knowledge of C++ language. Since I am very interested in robotics, I now belong to a laboratory at the University of Tokyo, which is developing space robots where I am studying robotic dynamics and simulations in the laboratory.

Extracurricular Interests:
In my spare time, I play soccer with my colleague.

David Ottesen

Univ. of Texas - Austin

Austin TX

Aero/Astro Engineering

Bachelor of Science, May 2010

PI: Sanford Davis

Project: Chemistry and Physics in a Dusty Disk

Email address: davidottesen@gmail.com

Introduction

Over the years, space exploration grew out of a curiosity into my full-blown passion. My future is in space. I am determined to further our knowledge of our solar system for humanity, for science. I am humbled by the sheer magnitude of what must be done. To explore the outer reaches of our universe, we will surely change the very fabric of our society. Who we are, what we are, all questions we are inexplicable bound to; questions that are ambiguous and unsolvable, but we try nevertheless.

My Past and Present

In the beginning, college was to explore the infinite possibilities available. I started with something familiar: teaching. Freshman year I tutored and mentored. I tutored college students for The University of Texas Learning Center in pre-Calculus, all of Calculus, differential equations, and intro probability. I mentored at-risk middle school students for The University of Texas Student Engineers Educating Kids by building simple engineering projects in an after school program. It was this year I learned to love teaching math, science, and engineering.

My sophomore year I explored what it meant to work on a student satellite project. That is, I worked a semester on ARTEMIS where I researched two-phase propellant flow, R-134a. Then, after being in school for 13 years with a few odd jobs in high school, I decided to intern for eight months as a Systems Engineer at Avidyne, a company that creates integrated Flight Deck Systems for light general aviation aircraft. I helped develop, review, and run test procedures and scripts for Avidyne's flight display products.

Beginning my junior year, I started research on a N-Body simulator for Dr. Cesar Ocampo and separately ran a fluids experiment on vibration reduction from micro bubble formation on a cylindrical beam. Both these initial research experiences illustrated the value of pursuing your curiosity in science. For Dr. Cesar Ocampo, I learned about a N-Body simulator and FORTRAN. For the fluids experiment, I learned of scientific rigor, scientific collaboration, and the greatness of scientific discovery when the experiment did in fact reduce vibrations. Around the middle of my junior year, I discovered the field of astrobiology after stumbling into a public lecture. I was hooked. I immediately applied to summer astrobiology programs around the country and was thrilled to be accepted to the Astrobiology Summer Program 2008 at Pennsylvania State University. This program was sponsored by the National Science Foundation and NASA. I worked under Drs. Andrew Belmonte and Stein Sigurdsson. I presented my findings on "Peptide Formation in an Aggregate of Surfactant Molecules". The research was an incredible opportunity that will forever sharpen my interest in space research, especially the pursuit of life in the universe.

Always interested in video games, my senior year I am working for Dr. Belinda Marchand in a Johnson Space Center sponsored 3D simulator. We program in C++ and use Trick, a NASA simulation tool kit. Our goal is to have a functioning open source simulator that can interface with Trick. We are using Ogre3D as the open source graphics rendering engine. I also plan to use this work for a free-body simulator for Dr. Cesar Ocampo. As a side note, this work is a lot of fun. The 3D simulator reminds me of an IMAX theater.

Finally, I have worked for two semesters as the Treasurer for the University of Texas chapter of the Aerospace Engineering Honor Society and been a member for now four. Every semester I have received Engineering Honors and I am a Livestock Show and Rodeo Scholarship recipient.

My Future

I intend to pursue aerospace research in astrodynamics and astrobiology. My next step is graduate school for a Masters in Aerospace Engineering. I am and always will be interested in mathematics, science, and the universe and will dedicate my life to furthering their respective frontiers. I spend my free time with friends, avidly listening to music, and anything I think is fun.

Laura Simurda

University of Southern California

Los Angeles, CA

Aero/Astro and Science Journalism

Master of Arts, May 2009

PI: Butler Hine and Will Marshall

Project: Lunar Spacecraft Development

Email address: simurda@usc.edu

Education and Experience:

Ever since I can remember, I have aspired to work in the space program. In my youth I wanted to be an astronaut, dragged my family on trips to Kennedy Space Center and always enjoyed gazing at the diamond-studded night sky. Those rare evenings my father would set up his small reflecting telescope on the front lawn were my favorite. Surprisingly, it was the moon and its mysterious dark grey craters that captured my imagination and the telescope was oftentimes focused on its surface. Fittingly, this summer I will have the opportunity to work on the Lunar Spacecraft Development program.

When I arrived at the University of Southern California six years ago, I was an undeclared student unsure of what course to take. I knew I loved engineering and science but as I had grown up, I had also realized that I loved sharing my passion with those around me. And so I set out to study three captivating and diverse subjects, pursuing a double major double degree program. In May 2008, I graduated with a B.S. in astronomy, a B.A. in print journalism and a B.A. in history. I graduated cum laude and was honored as a Renaissance Scholar Prize Recipient, an award annually bestowed upon 10 students who have shown both breadth and depth in their studies. The university also conferred the honor of having my name imprinted on a permanent plaque placed on the "Wall of Scholars" in USC's Leavey Library.

During my five years as an undergraduate at USC, I consistently wrote for the Daily Trojan newspaper and created the paper's science beat. Then, in my junior year, I was also offered a research assistantship in astrophysics with Dr. Geraldine Peters. Utilizing the abstract concepts I had perceived as little more than theoretical discussion during my undergraduate courses to determine concrete details, such as the orbital phase of stars, proved incredibly fulfilling and cemented my passion for astronomy. I spent much

of my time filtering through and processing data, for example measuring spectral lines and logging the data.

Then last summer I had the opportunity to intern in Garching, Germany, serving as a science journalist with the European Space Agency's Hubble office. I completed numerous projects centering on science writing, including composing articles and press releases as well as conducting research. Of particular interest were the DVD script and the two books that I edited. Throughout my stay I assumed a leadership position in many of these projects and have been acknowledged in the DVD and book *Eyes on the Skies: 400 Years of Telescopic Discovery*, the official book of the International Year of Astronomy. I have also been acknowledged for rigorously editing the book the *Hidden Universe*.

But I wasn't done studying yet. I returned to USC this year to obtain an M.A. in science journalism, which I will receive in May 2009. During my stay, I studied and composed a thesis on the future and place of space tourism in the United States.

Next year I will return to school to complete an M.S. in aerospace engineering with a focus on space sciences. As life becomes increasingly complex and scientists demystify the universe, I passionately believe the exploration of space and the design of tools to facilitate these discoveries enhance the lives of individuals around the globe. Every day, the incredible applications of aerospace engineering, from the design of novel robotics to spacecraft, thoroughly enhance our understanding of the world surrounding us and what it means to be human by expanding the bounds of science.

Over the past year I have worked for the Physics Demo Lab at USC setting up a wide array of experiments for physics and astronomy courses. I enjoy the job because it allows me to apply the knowledge I gained as an undergraduate in a practical manner and fulfill my desire to continue exploring science. At the same time, I compose press releases and internet articles for the Spitzer Space Science office at Cal Tech.

Hobbies

Outside of the classroom, I love to spend time exploring the outdoors or curled on the sofa reading. I have always been drawn to the ocean and have been SCUBA certified since I was twelve years old. As I live 20 minutes from Disneyland, my best friends and I are Disney-a-holics and visit the theme park as often as possible. Some of my other hobbies include photography, community service and sailing.

I am also very fond of traveling. In the past few years I have traveled to Edinburgh, Scotland (where I lived and studied at Edinburgh University for five months); Munich, Germany (where I lived and interned with the European Space Agency for three months); Hong Kong, China; Macau, China; Dublin, Ireland; Paris, France; Rome, Italy; Venice, Italy; Switzerland; Costa Maya, Mexico; Salzburg, Austria; Vienna, Austria; Jamaica; Banff, Canada; Drumheller, Canada; Cayman Brac.

And I cannot wait to see what the future holds.

Joseph Starek

University of Michigan

Ann Arbor, MI

Aero/Astro Engineering

Bachelor of Science, May 2010

PI: Bill Warmbrodt and Larry Olsen

Project: Advanced Rotorcraft Aeromechanics Research

Email address: jstarek@umich.edu

Education and Experience

Let me tell you a little bit about myself. I was born and raised in Chapel Hill, North Carolina. I now live in Wilmington, NC, just a few hundred yards from the Atlantic coast. Currently I am in my third year of undergraduate aerospace engineering study at the University of Michigan, where I am also pursuing a minor in physics. I enjoy learning about anything and everything, but I am especially fond of the sciences and mathematics. From the minute I learned about Newtonian mechanics in my first physics class, I knew I wanted to do something involving physics for the rest of my life. The power in its simple equations to so accurately predict the nature and construction of the universe around us is fascinating. As I have progressed through my academic career, I have channeled this interest into aerospace. Aerospace is compelling because it blends so many different areas of science into several highly advanced technological applications. The fields that I am most interested in are aerodynamics, orbital mechanics, and flight control. Aerodynamics is a thrilling topic because it reveals to me the theory behind what I believe to be one of the most spectacular achievements of mankind: human flight. Orbital mechanics and controls are also intriguing because they finally explain to me how it is possible for NASA to accomplish all that it has. I chose aerospace, though, not only due to its interesting nature, but because I wanted to apply my scientific knowledge to something useful and important. To me, pushing the envelope of human knowledge to the outer fringes of the atmosphere and beyond seems a meaningful and fulfilling pursuit.

Some of my project experience includes such class projects as organizing a launch mission for a geosynchronous satellite, modeling and optimizing the design of the AIM-9M Sidewinder missile, and analyzing the flight performance of a hypothetical aircraft. I also have experience working with subsonic atmospheric inlet wind tunnels and free surface water tunnels. As for work experience, during the summer of 2008, I worked for GE Aviation in Wilmington, NC at a manufacturing plant. There I got to observe the processes required to construct high performance aircraft engine parts, including high pressure compressor (HPC) and high pressure turbine (HPT) components for the GE-115B, CFM-56, and other engines. I learned a great deal about manufacturing, and the interaction between process and manufacturing engineers with design engineers. It was an interesting side to the aerospace industry that I had never before witnessed firsthand.

As for this upcoming summer, I am very excited to work at the NASA Academy at Ames. I look forward to working with Dr. Warmbrodt in the area of rotorcraft aeromechanics research. I plan to soak up as much knowledge as possible, and I can't wait to experience all that Ames has to offer. It will be exciting to see other research centers too, along with all of the other locations we are planning to visit.

Extracurricular Activities

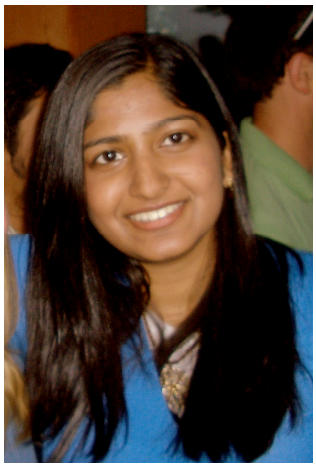
As for my life outside of school, I participate in several service organizations and engineering clubs. I am a member of Tau Beta Pi, an engineering fraternity and service organization, through which I have led projects and participated in many hours of service. In addition, I am involved with the University of Michigan's Engineering Council as a member of the Honors and Services Committee. We work to organize service events for the engineering community at the UofM. My other extracurricular activities include over a year with the Experimental Aircraft Design Club and some experience with the University of Michigan Solar Car Team. I also enjoy running, skiing, and racquetball. And of course, it's always fun to cheer on the Michigan football team.

Future Goals

Starting in the winter term of 2010, I plan on pursuing a Master's degree in aerospace engineering. I also have an interest in pursuing a PhD in aerospace engineering thereafter. As for a future career, I aspire to be an engineering research and design project leader working with cutting edge technology, and hope to end up working at NASA or a similar organization full time. In particular, I would like to be involved in the development of new and innovative aerodynamic designs.

2009 Academy Staff

Anita V. Mantri



Rice University

Houston, TX

Environmental Science

Bachelor of Science, May 2009

Academy Staff Member

Alumni of 2008 Ames Academy

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Growing up in Houston, Texas with a multicultural family had a huge impact on my personality, my interests, and my career goals. From a young age, I have been influenced by my Jamaican, Canadian, Indian, American, and Texan heritage. My mother, father, sister, and I dance to reggae music, yell at the players during hockey games, attend Hindu temple service on Sundays, and make it point to go to the Livestock Show and Rodeo every year. Therefore, it had always seemed natural to integrate aspects from differing worlds for the sake of innovation. Living in Houston, I was amazed by the medical advancements of the Texas Medical Center and entranced by the sense of adventure found at NASA Johnson Space Center. Throughout grade school, I became increasingly fascinated with the human body's innate ability to undergo subtle adjustments in response to changes in both internal and external environment. Therefore, I was in awe when my summer camps at Johnson Space Center opened up an entirely new world of human survival.

My career goals lie in the area of space medicine and habitat design. I am intrigued by the way astronauts can adapt to a microgravity environment and then easily revert back to a life on Earth. I will be graduating from Rice University in May 2009 with a degree in Environmental Earth Sciences. My summer with the NASA Academy in 2008 was one of the most exciting and most challenging summers of my life so far. I had truly been tested mentally, physically, and emotionally. When I look back, it boggles my mind to just think about how much we did in only 10 weeks. For my independent research project, I worked with Dr. Eduardo Almeida examining the effects of simulated gravitational environments on the rate of cell death in mouse bone cells. In addition, I have continued working with our group project which looked at the effects of salts on the melting point of water in Martian soil. I am extremely excited to be a NASA Academy staff this year! I can't wait to meet all of you.

Matthew F. Reyes

Exploration Solutions, Inc.

Winter Park, FL

Biology and Astronomy

Academy Staff Member

Alumni of 2000 Ames Academy

Email address: astrobiologist3@gmail.com

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 continuted to apply after two rejections. It was not until my 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 studing 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 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 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 worlds first publicly available microgravity flight experience. The opportunity was irresistable, 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 Haughton 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 educationg 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.

Carol R. Russo

Deputy Director for Code T and Executive Director for NASA Ames Academy for Space Exploration

NASA Ames Research Center

Email address: carol.russo@nasa.gov

Dr. Russo is Deputy Director for Exploration Technology and begins her first year as Executive Director of the Ames Academy. She is dedicated to continuing the incredible legacy of this unique program and warmly invites everyone to a summer of fun and rewarding leadership experiences.

Her thirty-five plus year career spans both aeronautics and space. She led advanced propulsion programs for GE Aircraft Engines for twenty years and then joined NASA as Director for Aeronautics at the Glenn Research Center in 1993. She transferred to Ames Research Center in 2000 and now leads a large technical directorate responsible for a broad suite of programs and international collaborations for missions on Earth and to Moon, Mars, and beyond. Dr. Russo holds leadership positions in the International Astronautics Federation and has lead AGARD and ASME international committees and conferences. She hails from Harvard and Boston Universities with degrees in fluid mechanics and aerospace.

She is looking forward to working with everyone in this year's Ames Academy and sharing what promises to be an exciting and outstanding suite of summer leadership activities that can propel your career and future life adventures. Feel free to call on her or anyone on the team to ensure that your Ames Academy experience is enjoyable and rewarding.

Douglas O'Handley

Emeritus Director for the NASA Ames Academy for Space Exploration

NASA Ames Research Center

Email address: dohandley@mail.arc.nasa.gov

In 1996, Dr. (Doug) O'Handley was asked by Ames's management to organize an Academy at Ames Research Center. He began the first Academy of 11 Research Associates (RAs) in 1997. Doug retired from NASA Ames after the 1999 Academy; however, he agreed to come back and keep the Academy going. With this Academy, he is assuming a new role as the Director Emeritus.

He has spent near 50 years in the activities associated with space. Doug rose to the level of Deputy Assistant Administrator for the Office of Exploration, the first (1989) attempt by an Administration at setting a goal of returning to the Moon and onto Mars. He was even the Acting Administrator of NASA one weekend when all the powers that be were out of Washington, DC and he was the only one left in town! Doug is a bridge to the experts, as well as an expert in his own rite. He is a great resource for connections within NASA itself and also among Universities and industry colleagues. Doug was appointed to lead the NASA Academy / Space Grant Consortia advisory Group.

Doug's hope is that you will all help him while he find a niche that is both respectful of the new leadership in the Ames Academy and still keeps him involved with all of you. He wants to continue the luncheons with each of you during the academy to get to know each of you better and allow you to let him enter into your long term future plans. He looks forward to meeting each of you.

Kristina Gibbs

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

NASA Ames Research Center

Email address: Kristina.gibbs@nasa.gov

Kristina Gibbs is the new Lockheed Martin Director for the 2009 Ames Academy. She is also a manager within the Lockheed Martin organization, supporting the NASA Astrobiology Institute and the NASA Lunar Sciences Institute. Kristina 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 this year 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.

Brad Bailey

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

NASA Ames Research Center

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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 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!

Liza Coe

Code V Program Director for the NASA Ames Academy for Space Exploration

NASA Ames Research Center

Email address: lcoe@mail.arc.nasa.gov

For over 25 years now, I've been making my way to NASA Ames nearly every weekday morning – with the exception of a few swing and graveyard shifts – and also vacations! I began my career designing and developing computer imagery system (CGI) applications for flight simulation at NASA Ames' Vertical Motion Simulator (http://www.simlabs.arc.nasa.gov/vms/vms.html). This work included development of extremely high fidelity imagery for fixed wing and rotorcraft simulation, as well as head-up and head-down displays for the Space Shuttle and military applications. I later focused on incorporating graphic visual displays into wind tunnel data representation.

Having decided to enact my not-yet-middle-age crisis on the career front, I took leave for one year to attend Stanford's Teacher Education Program (STEP) to earn a Master's in Education as well as teaching credentials in mathematics and computer science. After returning to Ames I joined the Education Division and focused on the development of teacher education workshops. However, I had been seriously bitten by the academia bug and returned to Stanford's PhD program in Curriculum and Teacher Education, focusing on science education.

My research has focused on how teachers leverage informal education experiences inside their classrooms. For my dissertation I was lucky enough to be able to work with teachers who, with their students, participated in week-long residential camps at California's Marin Headlands – part of the Golden Gate National Recreation Area and one of the components of the

environmental education-based Yosemite National Institutes. While about half of my research time was spent doing classroom observations and interviews, I got to spend the other half hiking around the gorgeous Headlands and learning as much natural science as I could absorb. My PhD minor is in geology, so I got my fill of sub-duction zone morphology courtesy of the San Andreas Fault which has left its mark in numerous ways on the Headlands.

Prior to the arrival of my two sons I took advantage of every field experience I could talk my way into. I spent several months on a tiny little island off the Katmai coast in Alaska excavating, identifying and cataloguing artifacts from an Indian civilization thousands of years old. Another favorite was spending a summer (their winter) in Western Australia tracing the Devonian extinction boundary in massive limestone and marble exposed reefs. Wanderlust has led me to spend many months (over time) working in and exploring the desert southwest as well as Alaska and, of course, California. If you ever need a travel guide on the West Coast, just let me know!

Now my time and energy (outside of work, of course!) is spent being mom to my two explorers-in-training. I am proud to say that they are world travelers and don't think twice about taking long plane rides to interesting places – if they can watch movies all night! They were both born in Russia and, since coming home have dragged their carry-ons with Mom to Alaska, Hawaii, Mexico, Australia and just about everyplace in between. In between trips they go to second grade while Mom earns the money for the next trip!

My primary responsibility is to ensure the success of the Academy which means that I lead a team of professionals who are dedicated to making the mission of the NASA Academy a reality. I work everything from the "big picture" of what NASA's goals are for the Academy, how the Academy will work (i.e. how to provide cutting-edge research experiences as well as training in leadership and team building) and the organization of experiences outside of your daily research efforts to enhance your learning. This year brings new leadership and staff to the Academy and we are very interested in your thoughts about your experiences and learning so that we can evolve the program to be even better than it is. To this end, I will be conducting evaluations of the program elements as we go through the summer - so every once in a while I will be asking you to take a step back for a few minutes from your everyday activities and reflect on what you've learned and experienced. We're all looking forward to a great Academy and a wonderful summer in Northern California!