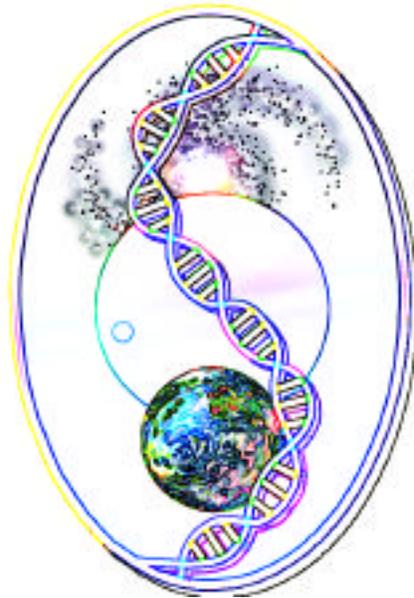


NASA Astrobiology Academy

2003



Profiles

**Ames Research Center
Moffett Field, California**

===== NASA Astrobiology Academy =====
2003
Profiles

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Julie B. Litzenberger	Resident Assistant	

==== **NASA Astrobiology Academy** ====

Introduction

The NASA Astrobiology 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 46-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 it 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, businesspeople, 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 and in creating new technologies that enable exciting new ventures in aeronautics and space exploration. Throughout its history, results from Ames' research have significantly influenced national and international policy, enabled most of the major space missions of the past twenty 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 nations economic well being.

NASA Astrobiology Academy

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

As a result, Ames is the only NASA center to support all NASA Strategic Enterprises and acts as technical bridge to transfer skill, knowledge and technologies among the NASA Enterprises. 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 NASA Center for Astrobiology and is also the lead NASA 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 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 Astrobiology Academy. 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.

The Astrobiology Academy

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 Ames' researchers have been selected through a highly competitive process for selecting only the best, the brightest, and the most innovative. The "match" between student (Research Associate) and researcher (Principal Investigator) will be done by mutual selection.

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. The other 60% of the working time will be spent in the laboratory of the selected Principal Investigator working on the technical project.

Activities -- June 22 to August 30

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 you all 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 your leadership qualities.

While we encourage the students to stay together as much as possible, we do not want you to feel trapped. All students will be housed at a local university with access to mass transit. The past six Academies were housed at Stanford University.

We plan several trips on the weekends. These include trips to the Jet Propulsion Laboratories, to Lawrence Livermore Laboratories, to the Dryden Flight Research Center, to Vandenberg Air Force Base and to other areas of interest in the West. Other weekend trips will be planned by the selected students 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. Every morning after breakfast at Ames the work starts at 9 a.m., lunch is at Ames, and dinner can be back at the student housing or at local eateries.

The Astrobiology Academy Experience

These past six summers, 13 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 Astrobiology Academy a unique experience. All that is missing are the unique individuals who can make these elements into a meaningful education.

Student Support

The NASA Academy program is co-sponsored by the participating NASA Center and the National Space Grant College and Fellowship Program. Students submit their applications to the Lead or Affiliate Space Grant Consortium office in their State. These applications are screened and forwarded to the appropriate NASA Academy 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 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:

WWW

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

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

Telephone & email

Tel: (650) 604-6746

Fax: (408) 245-7596

Cell (408) 666-4319

EMAIL: dohandley@mail.arc.nasa.gov

US mail

NASA Astrobiology Academy

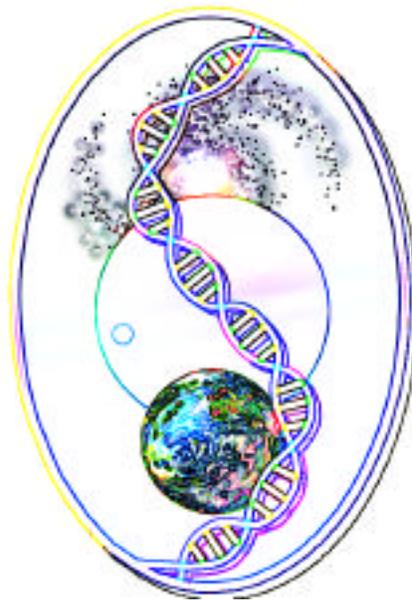
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NASA Ames Research Center

Moffett Field, CA 94035-1000

Applications for the Academy programs are available on-line beginning in November. Check the Academy homepage at either of the addresses above for the application availability and due dates.

2003 NASA Astrobiology Academy



Research Associates

Vanderbilt University
Nashville, TN

Biomedical Engineer
Bachelor of Science, May 2004

**NASA Academy Research Project:
Educational Activities in Astrobiology**

Principal Investigator: Dr. David Morrison



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Education and Experience:

I am currently a junior in the school of engineering at Vanderbilt. My major is Biomedical Engineering. This course of study has allowed me to pursue my two main academic interests: science and engineering. The curriculum consists mainly of engineering concepts applied to the human body and medicine. I have taken courses such as: Physiological Transport Phenomena, Systems Physiology, Thermodynamics, Biomechanics, Medical Imaging, and Biological Statistics. I enjoy the course work because the focus is on the integration of systems with the body rather than on the systems themselves.

Last summer, as a member of the NASA Undergraduate Student Research Program I worked with two other interns to design and build an electromagnetic levitation system intended to simulate microgravity conditions. I also presented a poster entitled, "*Microgravity Simulation Using a Three Dimensional Electromagnetic Coil System and Its Applications to Astrobiology*," at a poster session and was a secondary author on two other posters. My partners and I collaborated on a research paper documenting our findings. Working at Ames Research Center last summer under Dr. Richard Boyle in the

BioVis laboratory was the best research experience that I have ever had, and it is the main reason that I chose to return this summer.

Extracurricular Activities:

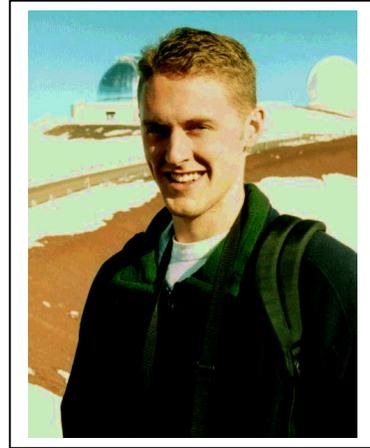
Growing up in Indiana I have always been an avid basketball player. I played for two years in high school along with four years of soccer. I also enjoy snowboarding and wakeboarding. The midwest and the south do not offer the best skiing, but I have gone to Colorado for spring break two years in a row and I find opportunities to enjoy the snow in my area when I get the chance. Wakeboarding has remained a hobby of mine since early on in high school despite the fact that neither my family nor I own a boat. I do, however, find a way to convince my friends to take me as often as possible and will probably spend a week wakeboarding on a lake in Tennessee with some friends before heading out to California this summer.

Stanford University
Stanford, CA

Aeronautics and Astronautics
Master of Science, June 2004

NASA Academy Research Project:
The Influence of Gravity and Mechanical
Forces at the Cellular Level

Principal Investigators: Drs. Nancy D. Searby
and Eduardo A. C. Almeida



School Address:

750 Escondido Road #139D
Stanford, CA 94305-7525
650-497-2212

Home Address:

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EMAIL: alwood@stanford.edu

Education & Experience

Each shuttle mission, sketching its path across the Florida sky, inspires my awe and ambition to become involved in the space program. Being able to see the shuttle flame and plume from my front yard instills an interest in space and science that leads me to Stanford University and NASA Ames to pursue a career in space.

Being a Stanford graduate student presents the unique opportunity of collaborative research between Ames and Stanford faculty. Currently a first year master's student, I anticipate Academy research blooming into the pursuit of a doctoral degree in space biomechanics. In graduate school, I have quickly become involved in research. With Prof. Charles Steele and Ames researcher Dr. Sara Arnaud, I have aided in the construction of a noninvasive medical instrument that measures the bending stiffness of human long bones. During the Academy, I will investigate bone cells and their response to hypergravity. Together, these projects provide a comprehensive picture of bone behavior under various loading conditions.

Undergraduate – where did the years go? Time passed so quickly while earning majors in Physics and Astronomy at the University of Florida. During this time, I worked with condensed matter physicists researching novel metals at extremely low temperatures (0.3-10 K). Our specialty was discovering and characterizing semi-metallic compounds

whose properties deviate from well accepted theory. This work culminated with four publications in Physical Review B of which I am a co-author. Each summer, I participated in undergraduate research programs, including the National Science Foundation's Research Experience for Undergraduates and the University Scholars Program (at the University of Florida).

Extracurricular Interests

In my free time I am usually running or biking in the Peninsula's foothills or swimming in the pool while training with the Stanford Triathlon Club. Counterintuitively, graduate school has seen my return to competitive sports. As a three-sport athlete in high school, my undergraduate career felt incomplete because elements of team camaraderie and intervarsity competition were missing. Although triathlon is mainly an individual sport, I enjoy the friendships that are forged while training. Sports, as well as other adventurous activities like SCUBA diving, hiking and skiing, get me outdoors and create a special balance between athletics and academics.

My most rewarding undergraduate experience was building a house for a needy family through the university's Habitat for Humanity chapter. I was involved in many aspects of the project including fundraising, volunteer recruitment and being the student construction leader. While learning construction techniques necessary to build a home, this experience developed and honed the communication and interpersonal skills essential to leadership.

My organizational involvement includes being a member of *Phi Beta Kappa*, AIAA, the National Space Society and the Society of Physics Students. With the Young Astronauts program at Stanford, I have helped teach elementary students basic science, engineering and space principles.

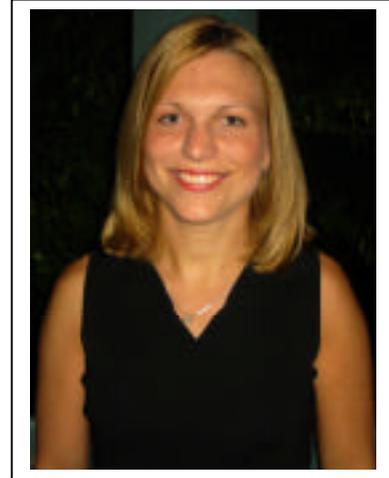
What's next? Upcoming plans include earning a pilot's license and becoming an expert mountaineer - Half-Dome, *El Capitan*, here I come!

Embry-Riddle Aeronautical University
Daytona Beach, FL

Aerospace Engineering
Bachelor of Science, April 2004

NASA Academy Research Project:
Radiation and Climate on Earth

Principal Investigator: Dr. Peter Pilewski



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Experience:

From the time I went to Space Camp in 4th grade I have known that I want to work for NASA and become an astronaut. It wasn't until high school that I finally knew the title of the career I wanted: Engineering. I attended Rensselaer Polytechnic Institute in Troy, NY for my freshman year studying aeronautical and mechanical engineering before transferring to Embry-Riddle Aeronautical University in Daytona Beach, FL in 2001 to pursue a strictly Aerospace Engineering curriculum. While at school I have become involved in grading and running a tutor lab for engineering students covering Statics, Solid Mechanics and Materials Science. Additionally I am a member of Sigma Gamma Tau (the Aerospace Engineering Honor Society) and a scholarship recipient from Women In Aviation, Society of Women Engineers and the American Institute of Aeronautics and Astronautics.

While in school I have also participated in two internships with the Metropolitan Washington Airports Authority Engineering Department at Dulles International Airport where I worked as an engineering technician on a variety of CADD projects.

I am also in the process of earning my private pilot's license and am hoping to have it complete by the time of graduation.

Extra Curricular Interests:

I have always enjoyed a wide range of activities. I have been a member of Girl Scouts for over 15 years and received my Gold Award as a senior Girl Scout. I also had the opportunity to participate in three Girl Scout Wider Opportunities that brought together girls from around the nation sharing a similar interest. These events were: ARROWplains to AEROplanes '95 in Oklahoma City, OK, Quantum Leap '97 in Toledo, OH, and Exploring the Night's Candles '98 in Southern California. All these events centered around astrophysics and engineering.

In addition to Girl Scouts, I have participated in Claude Moore Colonial Farm's docent farm child program. This is a volunteer program where you reenact the life of a farm child in pre-revolutionary Virginia for visitors to come and see.

I also enjoy music and was very active in band during high school, as a member of Symphonic band, marching band and the pit orchestra for musicals.

My favorite activity would have to be traveling with my family. I have had the opportunity to travel to many parts of the United States and abroad. My favorite trips would have to include Southern Spain, Mexico and our cruises of the Caribbean.

Princeton University
Princeton, NJ

Mechanical and Aerospace Engineering
Bachelor of Science - Engineering. June
2004

NASA Academy Research Project:
Searching for Life Underground:
Experiments with Drilling in Mars
Analog Terrains



Principal Investigator: Dr. Carol R. Stoker

School Address:

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530-758-1347

EMAIL: nchow@princeton.edu

Education and Experience:

I'm a junior at Princeton University, majoring in Mechanical and Aerospace Engineering with a certificate in American Studies. The upper-class courses have been quite rewarding, as I enjoy participating in the hands-on aspect of engineering. This year, in my Engineering Design class, I worked in a team to design and build a search and rescue robot. Being involved in the design and manufacture process from start to finish was extraordinarily fulfilling, and I look forward to my courses on space flight and space design next year.

At some point during high school, I developed a strong interest in aerospace engineering. I spent the summer after graduation volunteering in a wind tunnel lab at the University of California at Davis. The following summer, I interned at Lucent Technologies: Optical Fiber Solutions in Norcross, Georgia. There, I worked with the Ribbon Manufacture Engineering group. I've always been interested in French language and culture, and during the summer of 2002, I had the opportunity to visit Europe for the first time. I worked as an intern at L'Ecole Nationale des Ponts et Chaussées in Marne la Vallée, France. More importantly, the fresh perspectives, the exposure to different approaches

and opinions, the rich culture, the awe-inspiring sights, and the thrilling experience of traveling on my own made my summer both exciting and personally meaningful. I'm excited about my research this summer, as I am interested in the aerospace and mechanical engineering aspects of the search for life underground on Mars.

Extracurricular Interests:

Ever since childhood, music has been a huge part of my life. Being Music Director of the Princeton University Wildcats, an a cappella group, takes up a lot of my time these days. I'm also an Orange Key campus tour guide, and yes, I do walk backwards. I'm involved in a few engineering student groups on campus, and I also tutor at our Writing Center. For the past year, I have coached a class of middle school students participating in the Future Problem Solving Program. In the last couple of years, I have realized that I have a growing interest in teaching in the future. I've always loved working with kids, and all my recent extracurricular activities have a common theme: teaching, leading, or advising. With the shortage of qualified math and science teachers nationwide, I hope to be involved in public education and infuse my students with excitement for and interest in science and engineering.

Harvard University
Cambridge, MA

Earth and Planetary Sciences
Bachelor of Arts, June 2004

NASA Academy Research Project:
Biogeochemistry of Microbial Ecosystems

Principal Investigator: Dr. Tori M. Hoehler



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Cambridge, MA 02138
617-493-2519

Home Address:
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Hastings-on-Hudson, NY 10706
914 - 478-2512

EMAIL: dekas@fas.harvard.edu

Education and Experience:

My curiosity about the origin of our world first drew me to the stars. During the last two years I have become increasingly curious about the origin of life, taking my interest in astronomy in a new direction. I now major in Earth and Planetary Sciences, allowing me to study everything from organic chemistry to biogeochemistry, in addition to astronomy. I am completely enthralled by these subjects. I am driven by a desire for answers: why? how? and sometimes disturbingly, for how much longer?

I spent the summer after my sophomore year of college in the Laboratory for Astronomy and Solar Physics at the NASA Goddard Space Flight Center. I worked with Dr. Ken Carpenter analyzing stellar spectra and assisting in the development of a testbed for the Stellar Imager, a space based UV/optical interferometer. Most recently, I have been working in Ann Pearson's lab at Harvard, investigating possible sterol production in bacteria and the effect of an oil spill on microorganisms in marshes on Cape Cod. It is projects like these that get me excited to keep learning and studying, both during the summer and after I graduate.

Extra-Curricular Activities:

Since I love science, it is not surprising that many of the activities I enjoy are outside, or directly related to science. I love to run, hike, bike, and play tennis and basketball. I also have recently developed a fascination with both rock climbing and surfing, so I hope to begin what I understand is the slow process of learning both of those soon. I teach weekly hands-on science lessons to second graders through ExperiMentors, a program which I co-directed this past year. I have been the captain of the Kirkland House Women's Intramural Basketball team for the past two years, and I coach basketball in a local elementary school through After School Hoops. I love photography – both taking pictures and going to exhibits – and I take noncredit photography courses. I also really enjoy cooking, particularly cookies and desserts involving dark chocolate or exotic fruit, and with the exception of being an astronaut, owning a bakery is the best job I can imagine.

Texas A&M University
College Station, TX

Mechanical Engineering
Bachelor of Science, June 2003

NASA Academy Research Project:
Physiology and Imaging of the
Vestibular System



Principal Investigator: Dr. Richard D.
Boyle

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EMAIL: robert2852@engineer.com

Education and Experience:

I love the idea of space travel! My dream job is to ferry people into Earth orbit and to the Moon for research, fun, and leisure. To learn more about space I have held three internships at NASA centers and contributed to several space-related research projects. I plan to study Aeronautical and Astronautical Engineering at MIT in graduate school and explore the research topics of autonomy and reliability in space system design. This area of study will teach me how to increase manned space system reliability and safety while simultaneously reducing space mission cost. Both of these are necessary to enable safe, cheap, and routine human access to space.

My sophomore year I performed my first internship at NASA Johnson Space Center (JSC). I helped to repair and refurbish space suits and EVA tools. It was amazing to think that the tools I tested would soon be zooming around the Earth going 17,000 mph in the hands of an Astronaut! This internship inspired me to learn about all aspects of the manned space program, and to pursue a job at Johnson Space Center after graduation.

In the summer of my junior year I performed my second internship at NASA JSC. During this term I worked in the Automation, Robotics, and Simulation Division. I

helped to develop a robotic arm training simulation that teaches Astronauts how to use the remote manipulator system (robotic arm) on the Space Shuttle.

My next internship was at Langley Research Center. I worked in the Advanced Materials and Processing Branch and tested piezoelectric ceramic actuators. These devices are very neat because they deform when an electric current is applied. My mentor and I tested piezoelectric pumps that did not have any moving parts! The pump parts are rigid but deform relative to one another when an electric current is applied to create a pumping action.

In addition to internships, I also contribute to space-related research projects at my university. Currently I am helping to characterize a visual navigation system that will be used to enable autonomous spacecraft rendezvous and docking, proximity operations, and on-orbit maintenance. Also, I am leading a KC-135 Reduced Gravity Student Experiment on the “vomit comet”. This is a NASA-owned jet that flies parabolas through the sky and subjects its passengers to periods of simulated microgravity. Our project is titled Asteroid Anchoring: Low Velocity Solutions to Landing on an Asteroid, and we are testing a way to attach thrusters to an asteroids surface. These thrusters could be used to move Near Earth Asteroids away from a collision course with our planet. Another project worth mentioning is my senior design project in which we are designing a pressurized, manned, Mars rover. We are investigating safe and redundant rover designs that incorporate inflatable materials technology similar to the Transhab module planned to provide crew quarters on the International Space Station.

I have enjoyed my internships and research projects and cherish the knowledge and friends that I have gained from each of them. This summer at NASA Academy I hope to learn more about the Astrobiology side of space research, and also how the NASA centers interact and coordinate to further the human exploration of space.

Extracurricular interests:

My hobbies include playing soccer, attending space-related conferences and seminars, and spending time with my friends and family. For three years I was a member of the Texas A&M Mens Club Soccer Team, and I also play city league and intramural soccer whenever I get a chance. I enjoy sand-volleyball, tennis, surfing, running, hiking, and anything active.

I am an avid space enthusiast and enjoy space-related conferences and organizations. I am a member of the National Space Society and the Space Frontier Foundation, and I participate in AIAA student meetings and conferences.

In addition to space and sports I spend the rest of my time with family and friends. My friends and I like going to clubs on the weekend and just hanging out. My parents and grandparents live on a ranch so it is fun to go home and hike, fish, or just relax.

Acadia University
Wolfville, NS

Biology

Bachelor of Science (Honors), May, 2003

**NASA Academy Research Project:
Hypergravity Effects on the Maternal-
Fetal System**

Principal Investigator: Dr. April E. Ronca



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Home Address:

Box 2265, RR#2
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902-532-2634

Email: erin.everett@acadiau.ca

Experience:

Having spent my childhood in the tiny fishing community of Victoria Beach, Nova Scotia, surrounded by abundant wildlife and the world's highest tides, it is no wonder that I developed an interest in the world around me. As a child, I enjoyed collecting and observing periwinkles, starfish and other sea critters in my makeshift ice-cream tub aquariums.

I am presently completing a Bachelor of Science with Honours in Biology at Acadia University in Wolfville, Nova Scotia. Last spring, I received a Natural Science and Engineering Research Council of Canada (NSERC) award to fund my honours research. My project allowed me to once again play with sea critters and focused on evolutionary mitochondrial genetics and sperm fitness in blue mussels. This required me to design creative and multidisciplinary methods.

My educational experience has been enriched by opportunities that have allowed me to share my enthusiasm for science education. I have been a teaching assistant in ecology,

vertebrate physiology and chemistry courses. In addition, I work as a vertebrate physiology lab technician. Last year, I traveled throughout New England as Acadia's Facility and Program Development Student Representative. Working with faculty, I helped design innovative program and facility strategies for Acadia. I also traveled to Project Kaleidoscope, a conference aimed at improving undergraduate science education. As the only student present, I feel I provided an important perspective.

Although I have diverse interests, my passion is medicine and I look forward to attending medical school next year. My love of human biology was first sparked in high school by an enthusiastic biology teacher and a co-operative education placement in a health centre. More recently, I have been drawn to the dynamic and multidisciplinary field of aerospace medicine. Although I am interested in classical medicine and how it looks at abnormal physiology in normal environments, I am eager to explore how normal physiology is affected by abnormal environments.

Extra-Curricular Activities:

In the last four years, I have been involved in a variety of activities both on and off campus. I volunteer at the local community health clinic, children's centre, and nursing home. Also, I am an executive member of the Acadia Biology Society. At this position, I founded BioBuds, a peer mentoring program between upper year and incoming biology students. I also enjoy singing in Acadia's International Gospel Choir. When I'm not at the lab or involved in these activities you can usually find me at aerobics, throwing a softball around, wandering in the woods or planning theme dinners and other social events.

Washington University
Saint Louis, MO

**Earth and Planetary Sciences and
Environmental Studies**
Bachelor of Arts, May 2005

**NASA Academy Research Project:
Charting the History of Earth's Earliest
Microbial Ecosystems**



Principal Investigator: Dr. David Des Marais

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Education and Experience:

The exotic promise of outer space is certainly enough to catch the eye of a young girl growing up in rural Missouri. And, not surprisingly, this was indeed my case. For as long as I can remember I've been interested in the mysteries of outer space, but never in becoming an astronaut. Instead, my childhood ambition was to head Mission Control. I knew there was more to space expeditions than the glamour of wearing shiny suits and floating around all day. I knew there were scientists on the ground making calculations and asking the important questions—and that's where I wanted to be.

My two years at Washington University in St. Louis have already given me scientific opportunities I could never have imagined as a young girl. I am lucky enough to work with some of those "scientists on the ground" on a daily basis, and the experiences I've gained from these interactions have been unbelievable. My interest in astrobiology has grown since I began working in a microbial geochemistry lab as a freshman; since then, I've been involved in various projects on understanding life in extreme environments. Following fieldwork in Vulcano, Italy, early this summer, I will begin an undergraduate

research project on hyperthermophilic Archaeons and their roles in the biogeochemical cycles of hydrothermal vent environments.

Extracurricular Interests:

Outside of class and the lab, I enjoy some tumbling time with Wash U's gymnastics club team. I also serve as an Arts and Sciences peer advisor, helping to guide freshmen through that perilous transition from high school to college life. When I'm not enjoying St. Louis, I can be found visiting my family, friends, and my four horses at Lake of the Ozarks, Missouri, where, in the summer, I take advantage of abounding water-sporting opportunities. I've also been lucky enough to spend every Christmas since I was ten on the ski slopes with my family at our cabin in the Colorado Rockies. It is this mix of family, friends, and academics that has always defined my life and that now keeps me focused on fulfilling all those lofty aspirations I had as a young girl.

Oregon Institute of Technology
Klamath Falls, OR

**Mechanical and Manufacturing
Engineering**
Double BS, June 2005

**NASA Academy Research Project:
Searching for Life Underground:
Experiments with Drilling in Mars Analog
Terrains**



Principal Investigator: Dr. Carol R. Stoker

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Experience:

Some of my most impressionable memories are of watching shuttle launches and visiting space observatories. These activities and my love for math and science inspired me to focus my life and education towards my goal of becoming a NASA mission specialist. After completing my dual BS in Mechanical and Manufacturing Engineering, I plan to obtain an MS in Aerospace and Astronomical Engineering, hopefully at Purdue.

As initial steps I have participated in many projects that will help me achieve my goals. The first was partaking as team member on the OIT NASA Science Team participating in the NASA Reduced Gravity Student Flight Opportunities Program. We conducted an experiment on thermocapillary bubble motion and the marangoni effect in hypo-gravity on the KC-135. I was in charge of data collection and cinematography of the experiment on board the flight. I also helped design and manufacture the experimental apparatus. During my week visit at Johnson Space Center I toured the underwater astronaut training facility and mockups of the ISS and shuttle. Also, as part of the preflight training all flight crewmembers underwent hypoxia training in the hypobaric chamber. As a counselor for the OIT summer space camp for high schoolers, I directed one of the teams in developing an auxiliary experiment to fly on the KC-135.

Currently, I am a member of the Mars Society and attended 2002 annual summer convention Boulder, Colorado. While at the conference I participated in many seminars and presented a paper on the properties and uses of aerogels for Mars exploration applications. The information presented was from my initial research done in preparation for developing an independent class on aerogel production.

My specific interest in the Experiments with Drilling in Mars Analog Terrains project comes from my deep belief that this preliminary remote exploration and search for life on Mars will be the necessary precursor to the next greatest accomplishment in the history of space exploration. The seminars that I attended at the convention prompted me to realize the need for extensive research in these areas prior to any manned mission.

My strong passion for creating innovative technology that will enhance the scientific community and my own understanding of space exploration drive me forward to find new and exciting projects to be involved with. In January 2004 I will be studying abroad for two terms in Melbourne, Australia and hope to find an internship for the summer. Presently, I have joined the background research team for the next reduced gravity research project proposal. Upon acceptance in the fall, our team will begin fabricating the experiment.

Extra-Curricular Interests:

I am the diversity coordinator for ASME and participated in the Oral Guard completion at the 2002 Regional Student Conference. On top of school organized activities, I am extreme in sports, I do every adventurous activity one can do in the air, water or on land. I could tell stories for hours so here is a list instead of my favorite dangers: Skydiving (A license pending -27 jumps and counting), SCUBA diving (advanced open water certified), snowboarding, spelunking, mountaineering, rock climbing (Sheldon High rock climbing team), white water rafting, Outdoor Program trip leader/participant, CPR and first aid certified. The less dangerous side of me enjoys all forms of dance including 6 years of experience in middle-eastern dance. In the spring of 2001, I taught a class in which students learned and performed middle-eastern dance along with sewing their own costumes.

**South Dakota School of Mines and
Technology**
Rapid City, SD

Geological Engineer
Bachelor of Science, December 2003

**NASA Academy Research Project:
Stimulated Infrared Emission from Rocks
during Deformation**

Principal Investigator: Dr. Friedemann Freund



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605-431-0710

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Same as school

EMAIL: john.keefner@sdsmt.edu

Experience:

I grew up in the Black Hills of South Dakota with a great love for the outdoors, hunting for the various rocks and minerals that are present in the plains and mountains of the area. Combined with a strong desire to understand the fundamental processes that drive the universe, I entered the South Dakota School of Mines & Technology pursuing a degree in Geological Engineering. As a senior, my undergraduate experience has included participation in multiple research projects, two fellowships, winning a research grant, two NASA internships at the University of Minnesota and Johnson Space Center, and most recently, a full scholarship for my last year at the School of Mines.

My professional interests include recognizing and organizing potential innovative multidisciplinary project-based research opportunities. I want to develop interesting ideas that have a broad impact on the world, and beyond! For these reasons, and a great interest in space exploration and space science, I have pursued a career at NASA and this summer with the NASA Academy.

Extracurricular Activities:

The activities generally considered extracurricular by most folks, spending time outdoors, climbing, caving, etc., are a critical part of my degree. I enjoy all these on a regular basis, even if they are an important part of my education! I am active in the Society of Economic Geologists, Association of Engineering Geologists, and the local chapter of the National Speleological Society. I someday hope to travel to Antarctica with the NSF funded Antarctic Search for Meteorites (ANSMET).

My other truly extracurricular activities include participating in the KC-135 Reduced Gravity Student Flight Opportunities Program (RGSFOP), where I had the opportunity to fly in microgravity aboard the "Weightless Wonder." As team leader, I have written proposals and helped build several experiments that test solar sail propulsion and deployment for future application to space flight. The most exciting set of experiments will fly the summer of 2003 with five universities coordinating resources to fly two experiments. The results from each experiment will be independently important, but taken together, will provide significantly more information on future solar sail deployment using node-bonded carbon fiber microtruss and ultra-thin mylar membranes.

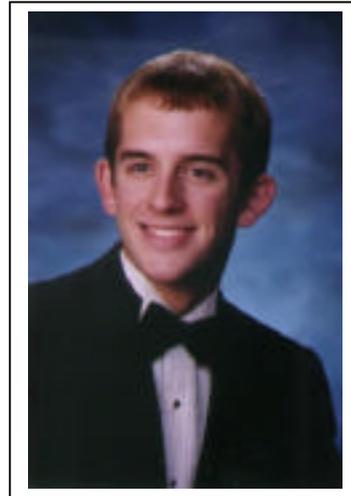
I am also committed to giving back to the community that made opportunities available to me. I am working as a mentor for three local FIRST high school robotics programs through the SD Space Grant. I regularly give scientific presentations, science fair advice, and public speaking advice to K-12 students in the area. I am actively working to promote undergraduate research at the School of Mines and other universities in South Dakota. My goal is to help drive students to success.

University of Maryland
College Park, MD

Mechanical Engineering
Bachelor of Science, May 2005

**NASA Academy Research Project:
Preparation of a Spectral Library for
Future Exploration of Mars**

Principal Investigator: Dr. Ted L. Roush



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Education & Experience:

The grandson of a World War II fighter pilot and the son of a military aviation historian, I have grown up in a world indulged in flight. Unlike my relatives, however, my passion has developed in the world of space, from exploration to study. From weekend trips into Washington, D.C., to visit the National Air & Space Museum, to studying books on the fundamentals of space science, my passion for all things space-related began at an early age.

During my high school years, exposure to the fields of biology and chemistry combined with my instinctive passion for space and sparked an interest in the field of astrobiology. As a student of the University of Maryland, College Park, the knowledge I have acquired as a mechanical engineering major has provoked my interest in space into new areas. After two years of undergraduate study, my thirst for knowledge of space related issues has rejuvenated itself, leading me thousands of miles across the globe to the NASA Ames Academy.

As a student of the University of Maryland, College Park, I find incredible intellectual stimulation on and off campus. As a member of the A. James Clark School of Engineering Honors Program, my involvement in Honors seminars and close interaction with professors have developed my creativity and leadership skills. My involvement in

the College Park Scholars Program, from colloquium classes to community projects, has enhanced my communication skills and provided an outlet for volunteer opportunities.

Research has been a key factor in my undergraduate education. In my freshman semester, I researched and developed a solar-powered water boiler. Recently, I have begun work on a walking micro-robot in the MEMS department. From elements such as design, microfabrication work in the clean room, and testing, my interest in MEMS has become a staple of my undergraduate education and promises to be part of an exciting voyage in the future.

Extracurricular Interests:

Outside of class, I am usually jogging around the Maryland campus or training in the weight room. As a Varsity letterman in ice hockey in high school, I have transmitted my disciplined work ethic from the ice into the gym. I also enjoy strumming my guitar when the occasion arises. I am partial to jazz and the blues, having studied the greats such as Robert Johnson and B.B. King. I also love to attend Maryland athletics events. From our national championship basketball program to the football and lacrosse teams, my interest in sports and school spirit combine in a euphoric state at each athletic contest.

Aside from sports and music, some of my most rewarding activities have taken place in the community. In my freshman year, my College Park Scholars class conducted disability surveys at the Kennedy Center for the Performing Arts in Washington, D.C. In high school, from teaching children and handicapped adults to swim in a local "Learn to Swim" Program to tutoring in math for the National Honor Society, I valued my participation in the community. And for the past three summers, I have enjoyed serving as a lifeguard and manager of local community pools.

My organizational involvement includes being a member of Pi Tau Sigma, the National Society of Collegiate Scholars, the American Society of Mechanical Engineers (ASME), and the American Institute of Aeronautics and Astronautics (AIAA).

What's next? After completing my undergraduate education, I hope to gain acceptance into a graduate/doctoral program. I plan to travel around the country, soaking in the different sites and cultures. I eagerly hope to continue my work in the community, lending my talents to benefit and educate others. Most importantly, I hope to develop my academic and leadership talents, be successful in the field of engineering, and pursue a career with NASA.

New Mexico State University
Las Cruces, NM

Geological Sciences
Master of Science, May 2005

**NASA Academy Research Project:
Detection of biosignatures with highly
sensitive radiolabeling techniques**

Principal Investigator:
Dr. David P. Summers



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Experience:

I have always been awed and curious by the processes that take place on our planet. When I was fourteen I visited my first cave and from that point on I knew science was my passion, and I would someday end up studying caves. At that time, I spent three consecutive summers at Space Camp, which intensified my love of the unknown and made me even more curious about those processes that take place outside our planet. It wasn't until my third year as a biology undergraduate that these passions began to form a coherent picture for my future. I came across an article focusing on the strange life found in the sulfur cave Cueva de Villa Luz in Mexico. The microorganisms in this cave slowly eat away at the walls, creating more space and passages and ultimately forming the base of a complex ecosystem. The walls drip with acid and the levels of H₂S reach toxic levels, yet life continues in this extreme environment. I knew at that moment that geomicrobiology was for me, and I was determined to learn all I could about these extreme environments. It was then that I realized this field of study could take me

underground into caves, as well as beyond our earth in the search for life on other planets.

After I graduated with a bachelor's in biology at Truman State University, I headed over to New Mexico State University to continue my education as a geology master's student. My research focus is on speleothems in Carlsbad Caverns and trying to determine if they were produced through the action of microbes or if they were just the byproduct of inorganic reactions. This requires the search for those ever elusive biosignatures--traces of life left behind from organic processes, traces that we can search for here on earth and on other planets. My current goals are focused on learning more about these biosignatures and searching for more definite traces. I believe my experiences at the Academy will allow me to learn more about my research area and help me focus my research goals, as well as having an amazing time in the process.

Extracurricular Activities:

It has always been my love of books and imagination that opened up new interests and experiences for me. It was a book that opened my eyes to geology and consequently led me to years of researching and studying rocks and geological processes on my own; something I continue to do today both in school and out of school. My passion for science as well as my love of writing has led me to consider the possibility of science writing. I enjoy explaining the complex processes of science to people who are not familiar with them, and it is something I hope to continue to do either as a writer or even as a teacher. I think the best part about being a geology major, though, is all the exciting work I get to do outside. I love hiking, camping, and especially caving. I have spent a lot of time out in the field for research--in the desert searching for plant fossils, on mountains looking for rocks, and in caves searching for potential speleothems. When I'm not thinking about science or observing it in nature, I try to stay active in volunteering. I've helped organize the collection of household items and food for two families of refugees, headed two volunteer organizations both in high school and in college, and have made friends at nursing homes, soup kitchens and inner city schools. And in my spare time, I love goofing off by watching great comedians and bad, campy movies with friends.

University of Washington
Seattle, WA

Aerospace Engineering and Geology
Double BS, June 2004

NASA Academy Research Project:
Mars, Water and Habitability:
Investigations of Data from Mars
Missions and Terrestrial Analogs



Principal Investigators: Drs. Nathalie A.
Cabrol and Edmond A. Grin

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Education:

I have always been interested in airplanes, rockets, and spaceflight, so it really wasn't a surprise to anyone when I decided to study aeronautical engineering (my parents would blame it on the Legos). About a year into college, after having taken an introductory geology course (and loving it), I decided to study geology as well. The reason for this was less academic, and more because the other geology students were a lot of fun. Besides, in what other major are you expected to beat rocks apart with a hammer? Needless to say, these are two very different majors, but one place that they intersect is in astrobiology and space exploration. How cool is that!

Experience:

I have worked on a variety of research activities, most of them completely unrelated to one another. I worked at UW's Seismology Lab for two years, during which we had the magnitude 6.8 Nisqually earthquake (the lab was getting a little boring up until that point). Through this job, I was able to travel all over the Pacific Northwest, installing seismographs, doing GPS surveying, working with emergency management personnel, and doing outreach.

I was also fortunate enough to be able to participate in NASA's Reduced Gravity Student Flight Opportunities Program; myself and four friends designed and flew a manufacturing experiment aboard NASA's KC-135 "Weightless Wonder" microgravity research aircraft in the summer of 2002. We flew with the experiment, and got to float around inside the aircraft. This was definitely a cool experience!

I also performed a geobiology research project looking at how heat-loving bacteria unexpectedly caused oxidation at a natural mineral spring in the Cascade Mountains.

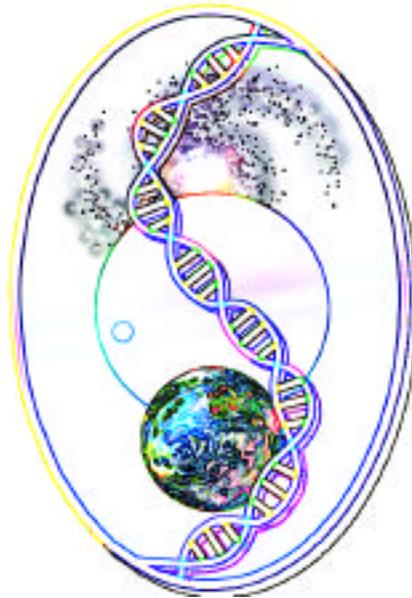
Another summer, I built and tested components for a high-altitude balloon payload, while learning about high-altitude atmospheric electrostatics; something I never thought I'd be doing.

All these experiences were very different, but each one made me want to learn more and expand my education.

Extra-curricular Activities:

I love the outdoors! I run, scuba dive, bike, sail, kayak, and hike, rock climb, snowboard and ski, and am an astronaut going-to-be. I like shooting off rockets, flying RC aircraft, and throwing Frisbees and boomerangs around. I am a licensed amateur radio operator and a broke student pilot. I enjoy traveling, meeting new people, and trying new things.

2003 NASA Ames Astrobiology Academy



Staff

Dr. Douglas A. O'Handley



**Director
NASA Astrobiology Academy**

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Dr. Douglas O'Handley is the Director of the NASA Ames Astrobiology Academy. He has also been associated with the Center for Mars Exploration at Ames. He retired from NASA after 40 years in government and academia on September 3 1999. He currently is employed by Lockheed Martin to continue his role in leading the NASA Ames Astrobiology Academy.

Dr. O'Handley 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 in Washington, D.C. After graduation from Yale University, he joined the California Institute of Technology, NASA - 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 transfer.

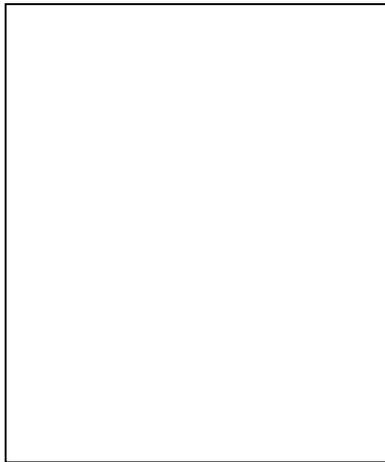
This was followed by a brief period as staff in the Director's Office at Ames. He returned to Southern California to work in the private sector at TRW in Redondo Beach. In 1988, he joined NASA Headquarters as the Deputy Assistant Administrator in the Office of Exploration. This was at the period of planning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

After returning to Ames in 1992, Doug was a member of the Space Sciences Division in the Space Directorate while directing the Academy as a civil servant. Although supposedly retired, in addition to the Academy, he holds an adjunct professorship at Santa Clara University where he teaches a course "Introduction to Space Science" within the Department of Physics. He also collaborates with Orbitec in Madison. The results of a lunar study can be found at the web sight <http://www.niac.usra.edu/studies/> and look under O'Handley.

He 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. He recently chaired the Space Exploration Committee of the International Astronautical Federation (IAF).

<http://home.earthlink.net/~dohphd/index.html>

Zann Gill



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David Lamb



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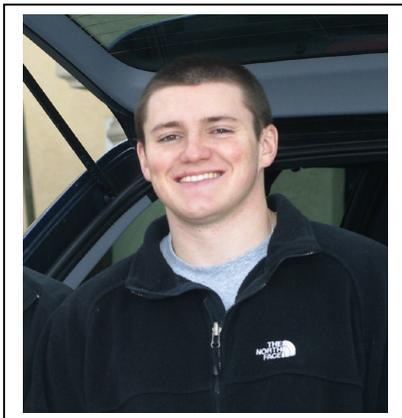
EMAIL: dlamb@arc.nasa.gov

Greetings all! My name is David Lamb; I'm returning to the Academy for the fourth time. My first Academy experience (as an RA) was in the summer of '99 at Ames. After taking a year off, I took up the Operations Manager position at Goddard. Last summer I was staff at my Alma Mater; this summer, I return for a more 'relaxed' role in the Academy. I feel privileged to be a part of such an amazing program that can touch and motivate the talented aspirants of tomorrow's space program. I'm still perplexed, however, about how I ever got in.

I often classify myself as an intellectual itinerant. Indeed, I have wandered to a great number of locales with a great diversity of research and administration responsibilities. Starting as a civil engineer back in '97, I decided that there was much more to life than sitting behind a CAD program for 9-10 hours per day. This 'epiphany' led me to pursue a Masters in Space Studies (specializing in planetary geology and astrobiology). Yet, my over-contemplative side won out, and this took me to commence a Ph.D. in the history and philosophy of science. Two semesters in, I decided that perhaps the life of an academic philosopher was not for me. But through it all, I was fortunate enough to be exposed to research in geology, invertebrate paleontology, geophysics, paleo-geomicrobiology, and the philosophy of science (focusing on biological and religious issues). I feel that my broad exposure to the sciences and humanities has given me a special (or perhaps skewed) perspective; I carry it with me everyday as a reminder of what a wondrous thing this life is. This fall I will again return to school to resume my Ph.D. studies. This time, the topic will be paleontology.

Beyond my intellectual pursuits, I often classify myself as an adventurer. To date, I think I've lived in about 10 different states and I've traveled throughout the U.S., to Europe, Canada, and Mexico. My extracurricular interests include hiking, skiing (snow and water), weight lifting, volleyball, running, martial arts, and, last but not least, creative writing. I'm also pretty handy with the computer (a PC man myself) and I am an ordained Universal Life Church Minister.

I look forward to becoming close friends with each and every one of the 2003 crew....



Resident Assistant

**NASA Astrobiology Academy
2003**

mhannon@alumni.nd.edu

After an excellent summer of 2002 with the NASA Astrobiology Academy, I simply could not pass up the opportunity to come back and join the 2003 crew. It will be a privilege working with all of you, and I am surely looking forward to it.

I graduated in May 2002 from the University of Notre Dame with a BS in mechanical engineering. During NAABA2K2, I worked with Dr. Robert Whalen in the Musculoskeletal Biomechanics Lab. As my research task I investigated the role that the fibula plays in the structural integrity of the lower limb, and developed a family of mechanical models of the tibia/fibula system.

I was set to begin my work towards a master's degree in biomechanics this past fall, but shifted gears somewhat. Thanks in no small part to my exposure to the life sciences over the summer, I decided to study organic chemistry and biology and prepare myself to apply to medical school. I plan to enter medical school in the fall of 2004.

Aside from academics, I have always enjoyed spending my free time in the outdoors. I am a proud recipient of the Eagle Scout award. I am a New Yorker originally, and had not spent much time out west prior to last summer. I quickly learned that northern California is a pretty awesome place. I love to snowboard and the '02' reunion at Squaw Valley in January was outstanding. Yes, I did take Julie on a black diamond on her second day of skiing...but that story is for another time, I am sure it will get told this summer. Last summer I even picked up a little on wakeboarding (essentially the water analog to snowboarding). I am up for any outdoor adventures. I am also a big fan of Notre Dame football.

I am highly anticipating the start of our summer, as well as meeting and getting to know all of you. Take care until then.



Resident Assistant
NASA Astrobiology Academy
2003

jlitzenberger@mail.arc.nasa.gov

After an incredible summer as a research assistant in the 2002 NASA Astrobiology Academy (NAABA2K2), I am looking forward to returning for a second round as staff for the 2003 Academy! I graduated in May 2002 from Tufts University in Boston, Massachusetts, with my BS in Civil and Environmental Engineering. Not convinced that I wanted to invest my future in the design of static structures, I began to venture into the world of biological sciences and, more specifically, the use of engineering principles to solve biological problems. I spent the summer of 2002 working with Dr. David Des Marais and Dr. Leslie Prufert-Bebout on a project entitled “Charting the History of Earth’s Earliest Microbial Ecosystems”. Fellow research assistant, Bekah Shepard, and I designed and built simulated natural environments in which to measure the growth patterns and biological processes of cyanobacteria from marine environments.

Unfortunately, the ten weeks spent in NAABA2K2 were not enough for me, and in September of 2002 I packed up the car and moved from my home in Boston back to sunny California. Since October I have had the privilege of working with Dr. Ruth Globus, Dr. Nancy Searby, and Dr. Eduardo Almeida in the NASA Ames Bone and Signaling Laboratory. We work to understand the cell signaling pathways that are associated with bone mass loss resulting from reduced mechanical loading. I have spent the majority of my time lately designing our protocol to quantify the curvature of mouse tibiae and analyzing differences in bone curvature due to age, gender, and genotype. My experience at Ames has been nothing but superb and has strengthened my decision to go into the field of biomechanical engineering.

It is difficult to put into words how the Academy influenced my life path and my ultimate career decisions. Since NAABA2K2 I have had the privilege of conducting research in an outstanding NASA laboratory with top researchers in my field. I have found a passion in biomechanical engineering, and in the fall of 2003, I will begin my graduate studies at Stanford University. It is my hope to collaborate with both NASA Ames and Stanford

through my Ph.D. program, studying biomechanics and its applications to extended space exploration.

Outside of NASA and academics, I entertain myself with a variety of activities. I was on the board of directors for the Society of Women Engineers at Tufts and was active in engineering outreach efforts to elementary and middle school kids. I co-captained my high school volleyball and softball teams, as well as my college rugby team, and I think I've played basketball and soccer since I started walking. I had my first run-in with the ski slopes this past January in a NAABA2K2 reunion at Lake Tahoe (you can all ask Mike how we ended up on a black diamond course...). Although unsuccessful at water skiing during last summer's Tahoe trips, I refuse to leave this summer without getting up on the skis! I'll take any chance that I get to travel, especially if it's going home to Boston! I am looking forward to traveling to Banff, Canada, this May to join the rest of NAABA2K2 in presenting our group project at the International Academy of Astronautics (IAA) Humans in Space Symposium. Academically, I am a member of Tau Beta Pi, Golden Key, and ASCE. I have vowed to in the future be able to add SCUBA diving to my extra-curricular activities, and to someday begin working towards a pilot's license.

I am very much looking forward to meeting and getting to know all of you in the 2003 crew and am so happy to have the opportunity to experience the NASA Academy for a second time! It's going to be a great summer!