



**NASA ACADEMY AT  
MARSHALL SPACE FLIGHT CENTER**

**PROFILE BOOK  
2009**



***"This is NASA's vision for the future. Our mandate is:***

- To improve life here,
- To extend life to there,
- To find life beyond

***So, how do we get to that impressive picture of the future? Part of the answer is by executing NASA's mission:***

- ***To understand and protect our home planet***
- ***To explore the Universe and search for life***
- ***To inspire the next generation of explorers  
... as only NASA can."***





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## ***Program Description***

The NASA Academy is an intensive resident summer program of higher learning for college undergraduate and graduate students interested in pursuing professional and leadership careers in space-related fields.

The NASA Academy program is designed to present a comprehensive package of information and experiences about the organization of the NASA agency, some of its most important current and planned science, engineering, education, and technology enterprises, as well as a number of non-technical areas of critical significance, such as management, budgeting, safety, personnel and career development, leadership, space law, international cooperation, etc. Besides attending lectures and workshops, students are involved in supervised research in MSFC laboratories, and participate in visits to other NASA Centers and facilities and a number of space-related academic laboratories and industries.



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## ***Eligibility, Selection Criteria, and Placement***

The participants in the Marshall NASA Academy have been selected based following criteria:

- academic rank (junior, senior, first, or second year graduate)
- academic performance (GPA higher than 3.0 or equivalent)
- demonstrated interest in the space program
- demonstrated leadership qualities
- research and/or project interest and experience
- maturity
- recommendation and references
- citizenship or permanent residence is required for US applicants

Both the selection process and placement of the Academy participants in Marshall's research groups were assisted by recommendations from faculty, administrators, academic supervisors, and co-workers, and the applicants' self-profiling essays.



## **A Brief History of the NASA Academy**

The NASA Academy was founded in 1993 (as the "NASA Space Academy") at the Goddard Space Flight Center by Gerald (Jerry) Soffen, former Mars Viking project scientist, architect of the NASA Astrobiology program, and first Director of the Goddard Office of University Programs. Jerry was an accomplished scientist and a dedicated educator. He took advantage of the unusual opportunities presented to him during his career and realized the importance of mentoring in the life of young professionals. In his vision, the Academy was intended to exceed in purpose and content all the other regular internships by familiarizing its participants with as many facets of the NASA agency as possible. With his dynamic personality and unique leadership, he opened many gateways and defined a new standard of excellence.

*"To give possible 'leaders' a view into how NASA, the university community, and the private sector function, set their priorities, and contribute to the success of the aerospace program."*



*Gerald Soffen, Founder  
(1926-2000)*

As the reputation of the Goddard Academy widened, new NASA Academy Programs were started at the Marshall Space Flight Center (1994), the Ames Research Center (1997), and the Dryden Flight Research Center (1997). In 2005 Goddard, Glenn, and Marshall will host their own Academy.

The name of the program changed from "NASA Space Academy" to "NASA Academy" at specific NASA Centers. A continuous effort is being made to establish or re-establish Academies at various NASA Centers, with different profiles and focus areas.

Jerry Soffen died on November 22, 2000. We honor his legacy by continuing the Academy program that he loved so well.

In 2002, the NASA Academy celebrated ten years of successful activity. So far, more than 500 students have graduated from the program, both domestic and international students.



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**Missouri S&T**

Rolla, Missouri  
Aerospace Engineering  
Bachelors of Science, May 2010

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**NASA Academy Research Project:**

*"Luner Lander Testbed"*

Principal Investigator: Marty Kress

**E-mail:**

jra337@mst.edu

**Work Experience**

- ***Design of a Wind Tunnel, Rolla, MO***
  - Designed a closed return, low speed subsonic wind tunnel, capable of producing low turbulence flow velocities of up to 250mph through a 32" by 48" test section.
  - Generated conceptual designs of the primary components of the wind tunnel circuit and estimated performance and power requirements of the tunnel.
  - Advisor: Dr Fathi Finaish
- ***Computational Fluid Dynamics study of Airfoils, Rolla, MO***
  - Studied the appearance of laminar flow bubbles near the leading edge of elliptical airfoils at low Reynolds numbers.
  - Tracked the size and location of flow bubbles, as they change with Reynolds number and angle of attack.
  - Attempted to measure the effect that the flow bubble has on the airfoil's lift, drag, and moment coefficient.
  - Advisor: Dr Fathi Finaish

**Hobbies and Interests**

Movies, video games, reading.

**Personal Statement**

Over the past several years, I have been involved in several research projects sponsored by the NASA Missouri Space Grant Consortium. From June 2007 to November 2008, I was involved in a feasibility study involving the design and development of a low speed subsonic wind tunnel capable of producing low-turbulent flow velocities of up to 250 mph through a 32 in by 48 in test section. Since that time, I have been involved in a computational fluid dynamics study regarding the development and effects of laminar flow bubbles on elliptical airfoils at low Reynolds numbers. These experiences have benefitted me in numerous

ways. As a result of these projects, I have dramatically improved my technical and communication skills, and have become intimately familiar with the research and design process.

I have a great deal of interest in the Aerospace field, but my interest has not been focused on one specific area. While I have conducted much research concerning low speed aerodynamics, high speed aerodynamics, astrodynamics, and propulsion have also become of interest to me. Through this internship opportunity, I hope to improve upon my strengths as an engineer by applying critical thinking, problem solving, and analyzing skills. I also hope for the opportunity to develop my personal and communication skills.

I have several personal reasons to apply for an Academy internship. Since I was a small child, I have been inspired and fascinated by the concepts of air and space travel. This is what has driven me to pursue a degree in Aerospace Engineering. Since arriving at college, I have engaged myself in research in an attempt to expand my knowledge and understanding in this field. I feel that this opportunity to conduct meaningful scientific research is the best way for me to continue on my quest for knowledge. I also feel that such an internship would be the best possible way for me to develop my research and engineering skills outside of the classroom. Finally, I feel that this would be a fantastic opportunity for me to explore career options within the Aerospace field, and become familiar with NASA, and what it has to offer me in the future.

I hope to pursue a career with a heavy emphasis on experimental research and design. I want to become engaged in the development of theoretical knowledge. My hope is to have a job that is intellectually stimulating and mentally rewarding; one that challenged me to the extent of my abilities and offers me the opportunity to continue learning throughout my career. I hope that, in my career, I can contribute to society through the advancement of human knowledge and the development of technology reflective of that. I believe that my past education and research experience have moved me in the direction of achieving my goals. I hope that, if my application for an Academy internship is accepted, I can come even closer. I would consider acceptance into one of these prestigious programs an honor and a privilege, and I appreciate your consideration of my application.



### **Auburn University**

Auburn, Alabama  
Polymer Engineering  
Bachelor of Science, May 2009



### **NASA Academy Research Project:**

*"Residual Stress Evaluation and Analysis of Welds"*

Principal Investigator: Tina Malone

### **E-mail:**

sab0003@auburn.edu

### **Work Experience**

- **Auburn University, Auburn, AL**
  - Student research assistant in Polymer Engineering Department
  - Prepared and analyzed solutions and samples
- **Auburn University, Auburn, AL**
  - Independent research for Undergraduate Research Fellowship Program
  - Researched and created shape memory polymers

### **Memberships and Activities**

- Phi Psi Honorary Fraternity-Auburn University
- Honors Program-Auburn University in Montgomery

### **Honors and Awards**

- Alva P. McCrary Academic Scholarship
- Tracy Louann and J O'Rorke Academic Scholarship
- Undergraduate Research Fellowship Program-Auburn University
- Chancellor's Scholarship-Auburn University in Montgomery
- Dean's List four semesters-Auburn University in Montgomery

### **Hobbies and Interests**

Reading (favorite authors are Jane Austen and C.S. Lewis), playing sports, and movie nights

### **Personal Statement**

As a young student in junior high school, I can recall the time my 8<sup>th</sup> grade science teacher taught a lesson on the different planets in our solar system. This subject quickly captivated my attention, and I have been intrigued by the universe and its components ever since.

Since that time, my interest in other areas of science has increased, especially in the fields of chemistry and physics. In high school, I took part in several clubs and competitions involving science and mathematics. At the end of my education, I even won the Science Award. It was given to only one person out of the senior class, consisting of over 400 students, for showing excellence in the field of science.

I began college with the intent of studying chemical engineering, but after attending an Engineering Day function at Auburn University, I found that I was more suited for Polymer Engineering. Through research and various school projects, I have discovered that polymers have a wide range of application at NASA. I have become greatly interested in the composites used for the space shuttles as well as the polymeric materials currently being researched for spacesuits.

I am currently part of the Undergraduate Research Fellowship Program at Auburn University, and I am researching shape memory polymers. In April, I will be traveling with other students in the fellowship program to La Crosse, Wisconsin, to present my work. While studying the uses of shape memory polymers, I learned that other researchers and scientists are also experimenting with shape memory polymers in spacesuits.

It has always been my dream to work with NASA and to contribute to its efforts. I feel as though I am a good fit for working at NASA. If I am not accepted into your program, I know that I still have many other opportunities to contribute to NASA's important mission. I have decided on continuing my education by going to graduate school, and after earning a Master's degree, I would like to find a position that contributes to the good work you do.



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**University of Illinois-Urbana**

Champaign, Illinois  
Aerospace Engineering  
Bachelors of Science, May 2010

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**NASA Academy Research Project:**

*“Bosch catalyst analysis and testing for  
CO<sub>2</sub> reduction”*

Principal Investigator: Morgan Abney

**E-mail:**

mduchek2@illinois.edu

**Work Experience**

- **Lab Assistant, College of Engineering, Urbana, IL**
  - Assisted in instruction of AutoCAD and Autodesk Inventor to students in GE 101: Engineering Graphics
  - Tutored and ensured students comprehension of course material and proper engineering documentation
- **Danaher Motion, Marengo, IL**
  - Assembled, tested, and troubleshot PCB boards and actuators in the engineering prototype lab
  - Worked in both AutoCAD and Photoshop to edit and rework engineering drawings
  - Observed operations of the factory and became acquainted with the type of problems many engineers work to solve

**Memberships and Activities**

- Small Group Leader in student group Intervarsity
- AIAA campus chapter member

**Honors and Awards**

- Campus Honors Program, University of Illinois at Urbana-Champaign
- James Scholar
- Danaher Corporation Scholarship
- Illinois General Assembly Scholarship
- Dean’s List
- Tau Beta Pi Engineering Honor Society Scholarship

**Hobbies and Interests**

Guitar, hiking, camping, traveling, reading, getting to know people.

### **Personal Statement**

As children, we are told to reach for our goals, our dreams. One of my dreams was to go to space one day. As I progressed through my education, I discovered that I had a passion for math and the sciences, many time reading the latest National Geographic or NASA tech briefs after finishing my homework. I found that I also had a talent for building machines, even ones so simple as LEGO robotics. This is what led me to choose Aerospace Engineering as my major and future career.

In high school, I became involved in community service and had the chance to work for the betterment of my community. This experience gave me the desire to pursue a career that would do more than get me money that would also improve the world that we live in. Through my work at college, my technical interests have matured and focused on technology having to do with aerospace propulsion, and space exploration and travel. Space exploration will serve to make the world a better place as new information about our solar system and beyond is brought back to inspire our youth and new technologies are developed that will have many applications in further advancing our knowledge and health.

At University of Illinois, I have gained much experience relating to my interest in aerospace and space technology. One project that I completed was the construction and launch of a rocket as part of a team of students. The rocket carried a camera, altimeter, and other instruments that transmitted flight data in real time to a laptop that served as our communications hub. After the launch, I analyzed the data from the flight using MATLAB and compared it with the theoretical predictions my team had made based on the rocket theory we derived in class. This experience served to increase my interest in space technology, and especially the engineering that goes into developing it.

All this points me to a career in aerospace engineering, working on an aerospace or space related project. I plan to pursue a graduate degree in aerospace engineering and then work for the company that most closely matched my interests with opportunities, or perhaps for NASA itself. The projects done at the NASA labs are exactly what I hope to work on in my future career. An internship at the NASA Academy this summer would give me experience that would make my graduate studies and research more productive, and bring me closer to my goal of contributing to society by working on a project like many of those at NASA.



## Mason Fisher

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### University of Virginia

Charlottesville, Virginia  
Astronomy and Biology  
Bachelors of Science, May 2010

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### NASA Academy Research Project:

*"An Analysis of the Galilean Satellites via  
HST Data: An Astrobiological Approach"*  
Principal Investigator: Melissa McGrath

### E-mail:

tmf4p@virginia.edu

### Work Experience

- **Intern, Environmental Studies at Airlie**
  - Worked under Drs. WJL Sladen and Tom Wood
  - Work was predominantly on the behavioral patterns of North American swan species
- **Mentored on IDL under Dr. Art Poland, former Project Scientist for SoHO**
- **Independent research under Dr. Greg Black (UVA)**
  - Focus on use of sulfur isotope fractionation as a potential biosignature on Mars
- **Kittronics RadioShack Franchise**
  - Sales Assistant

### Memberships and Activities

- Founding member and Chapter Representative, UVA Astronomical Society
- UVA Cavalier Marching Band
- UVA Aikido
- UVA Swing Dance Club
- GARO(Genocide Awareness and Research Organization)

### Honors and Awards

- Alpha Sigma Phi Honors Society

### Hobbies and Interests

Horseback riding, Music (both performing and listening to), Zen Buddhism, Swing Dancing, Reading (especially science fiction and humor)

### Personal Statement

Discovery has always been a passion of mine. I spent my childhood tramping around the backwoods surrounding my home, creating crude catalogs of native animals, and mapping out the local environment. As I got older, this developed into an intense interest in the next great unexplored wilderness-space itself. This, combined with my fascination with the biological world, eventually lead me to the emerging field of astrobiology. I have found this subject deeply intriguing, and have set upon making it into my future professional field.

As I approach the end of my college career, I have set a new goal for myself: to become one of the world's foremost experts on biosignatures elsewhere in the solar system. I've already done considerable research on sulfur isotope fractionation on Mars as part of an independent study project. I plan on expanding this endeavor for my Senior thesis to include investigations of all potential Martian biosignatures. I also have experience in field biology, both at macroscopic and microscopic scales. I intend to pursue a PhD in the field of astrobiology upon the completion of my undergraduate study, and work up from there. My ideal would be to have the chance to actually do field research on the surface of Mars itself, but for the time being, I am more than happy to take whatever I can get.

I believe participating in the NASA Academy program could provide me considerable assistance in attaining these goals. The opportunity for hands-on research with current data would be invaluable. It would also give me a sense of how the field works in the "real world". On a more pragmatic level, since I have never before had the opportunity to actually work for NASA in a direct fashion, I figure it's more than worthwhile to intern there, given that I plan on working there professionally in the future.

In closing, I believe that I have much to contribute to the field of astrobiology via the NASA Academy, and that the experience would provide excellent preparation for my professional career.



**University of Virginia**

Charlottesville, Virginia  
Astronomy and Biology  
Bachelors of Science, May 2009



**NASA Academy Research Project:**

*“GBM Data Analysis of the Gamma Ray Sky”*

Principal Investigator: Colleen Wilson

**E-mail:**

[harrishaynes@gmail.com](mailto:harrishaynes@gmail.com)

**Work Experience**

- **University of Virginia Department of Astronomy, Charlottesville, VA**
  - Performed research on X-ray binary systems under the guidance Professor Craig L. Sarazin
  - Gained in-depth experience in astronomy and astrophysics by researching binary systems containing but not limited to neutron stars, pulsars, and black holes
  - Used data from Chandra X-ray Observatory to map the distributions of low-mass X-ray binary systems in S0 (lenticular) and elliptical galaxies
- **Charlottesville-Albemarle SPCA, Charlottesville, VA**
- **Russell Medical Center, Alexander City, AL**
  - Shadowed Dr. Graham L. Howorth, M.D., during multiple orthopedic surgeries including both open and arthroscopic ones

**Memberships and Activities**

- Virginia Men’s Club Soccer Team
- Virginia Women’s Varsity Soccer Scout Player
- Phi Kappa Psi Fraternity, Finance Committee and Chapter Standards Board

**Hobbies and Interests**

Soccer, wakeboarding, snow skiing and snowboarding, telescope observing, and traveling.

**Personal Statement**

While there are numerous reasons why I would like to attend the NASA Academy, the aspect I find most attractive about the program is its ability to expose students to a wide variety of NASA areas, academia, and private space-related industries. Because I am still undecided on the exact

path I will take after college, the program seems perfect for someone (like me) who is interested in pursuing some kind of professional or leadership career in an aerospace field. Over the past four years at the University of Virginia, my curiosity in the sciences (especially astronomy and space exploration) has continued to grow, and I am very interested in furthering this passion for the subject past my graduation in May. Thus I have been in contact with the graduate department for Aerospace Engineering at the University of Alabama and am presently considering pursuing a degree in that area.

I also wish to attend the NASA Academy to gain the necessary skills and experience that are essential for a successful, future career in a space-related field. The thought of working hands-on with new technology under the close guidance of experts is exciting enough in itself to make any aspiring scientist or engineer want to take part. In addition, the chance to be in direct contact with professionals who understand and deal with the managerial and political issues surrounding the aerospace program is also exhilarating. At present my experience included extensive laboratory work in a variety of subject areas including, but not limited to, astronomy, biology, chemistry, and physics. From working in close proximity with other students and professors, I have learned many valuable skills ranging from leadership and teamwork to handling chemicals and ascertaining how things work. Aside from laboratory practice, I also have experience in conducting research and analyzing data. I am currently working on my astronomy senior theses in which I am using data from Chandra X-Ray Observatory to map the distribution of low-mass x-ray binary systems in S0 and elliptical galaxies. For these reasons I would very much like to take part in the NASA Academy and not only learn new skills but further develop and sharpen older ones.

In closing, I very much want to attend the NASA Academy because I wish to receive a well-rounded, educational experience that can only be obtained by actively participating in a program that truly encompasses every aspect of the aerospace industry. Rather than focus on one specific portion of the aerospace program, I desire to learn about a variety of areas and benefit from all they have to offer. More than anything else, I truly want the entire NASA Academy experience.



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**Catholic University of America**

Washington, District of Columbia  
Chemistry  
Bachelors of Science, May 2010

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**NASA Academy Research Project:**

*“Structured Adsorbent Media for Maintaining Cabin Air Quality”*

Principal Investigator: Jay Perry

**E-mail:**

alabatete@yahoo.com

**Work Experience**

- **REU Program Undergraduate Researcher, Georgetown University Chemistry Department, Washington, DC**
  - Synthesized and analyzed luminescent copper-halide-ligand compounds
  - Used hydrothermal and solution synthetic routes, infrared spectroscopy, powder X-ray diffraction, and single crystal X-ray diffraction characterization methods
- **Undergraduate Researcher, The Catholic University of America, Washington, DC.**
  - Prepared buffers quantitatively and determined pH levels
  - Categorized journal article entries using Research Manager program
- **Lab Assistant, The Catholic University of America Chemistry Department, Washington, DC.**
  - Maintained laboratory equipment and prepared experiments
  - Worked alongside lab manager, professors, and teacher's assistants

**Memberships and Activities**

- Martin Maloney Chemistry Club, Fall 2006-present
- St. Vincent's Chapel Lector, Fall 2006-present; Head Lector, Spring 2008-2009

**Honors and Awards**

- University of Maryland Baltimore County Undergraduate Research Symposium 2008 participant
- William Lowell Putnam Mathematics Competition 2008 participant
- Barry M. Goldwater Scholarship 2008 nominee

- Phi Eta Sigma freshman honor society, inducted Fall 2007

### **Hobbies and Interests**

Drawing, painting, cooking and baking, restaurateur for ethnic foods.

### **Personal Statement**

Throughout my academic career, I have possessed a thirst for knowledge that went far beyond standard curriculum. I quickly came to understand what I was capable of pursuing yet continually challenged myself to go even further. In high school I not only took upper-level courses and obtained good grades, I went outside my comfort zone of pure academics. I joined a sports team and participated as a backstage crewmember in plays. Most importantly, I became involved in student government. I started off as a freshman representative, continued my sophomore year, was voted in as a junior secretary, and finally, I ended up as Student Council President.

All the while, my knowledge expanded from academics to teamwork and leadership. I learned how to work with peers of varying maturity and age in addition to working with professors and administration personnel. Such experience gives me the confidence that I can perform well at the NASA Academy. I feel comfortable working on a team and even leading a team towards a research goal. This past summer, I performed research at Georgetown University. Though I was part of a team of graduate researchers, I still assumed the role of leading my own project. When faced with a challenge during my research, I not only asked for help but successfully found a solution. The hard work and dedication that I put into everything I do has allowed me to experience moments of success and strive to achieve even more.

As I mentioned earlier, I enjoy challenging myself especially when it comes to academics. Although it exceeds the minimum requirements of my chemistry major, I have chosen to take university-level mathematics and physics courses during my years at Catholic University. I have also taken part in the University Honors Program despite having to survive rigorous class schedules.

In addition to my teamwork and leadership skills, I believe it is my passion for knowledge that makes me a strong candidate in the NASA Academy. If given the opportunity, I assure to devote the same passion and effort that I express for my academics and research. After graduating in 2010, I hope to continue satisfying my thirst for knowledge through research via graduate school or a location such as NASA.



## **Cheryl Perich**

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### **Marquette University**

Milwaukee, Wisconsin  
Mechanical Engineering  
Bachelors of Science, May 2010

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### **NASA Academy Research Project:**

*“ECLSS Vapor Compression Distillation and Brine Processing”*

Principal Investigator: Keith Parrish

### **E-mail:**

cheryl.perich@mu.edu

### **Work Experience**

- **Marquette University Physics Department, Milwaukee, WI**
  - Designed labs and writing assignments, prepared lab equipment, graded assignments, lectured on lab content, and assisted students in completing procedure.
- **The Boeing Company, Houston, TX**
  - Integrated Thermal Co-op engineer responsible for compiling and comparing radiator temperature data for active thermal analysis during the shuttle docked phase.
- **Caterpillar Inc, Peoria, IL**
  - Internship in Caterpillar Environmental Technologies developing a new MFG/Pro Releasing Process in order to define a more robust and structured process to assist in the velocity and efficiency of change management.

### **Memberships and Activities**

- President of ASME Marquette Chapter
- Marquette Sailing Team Vice Commodore
- Freshman Engineering Transformational Design Program Supervisor

### **Honors and Awards**

- NASA WSGC Undergraduate Research Recipient and Scholarship
- Alpha Sigma Nu Jesuit Honors Society Member
- Ignatius Academic Excellence Award
- Marquette Honors Program Member

### **Personal Statement**

I feel that the NASA Academy offers opportunities that no other research or co-op position can offer. In previous work, I have had the opportunity to work with both types of opportunities individually, through two co-op rotations at The Boeing Company, an internship with Caterpillar, Inc., and research through the Wisconsin Space Grant Consortium. While all of these opportunities have been extremely valuable in expanding my knowledge and experience in engineering and science, I feel that the NASA Academy can incorporate the best of each of these into one united program. It can offer the intensive research that I had immersed myself in with the WGSC, while integrating the program management skills and networking opportunities that working at large company offer. Furthermore, this particular program offers opportunities for educational seminars that incorporate the intense intellectual advancement that usually only a university setting can provide. Finally, the NASA Academy stresses the importance of both individual leadership and teamwork, which I feel can be hard to balance in either an isolated research or co-op position. The Academy gives students a chance to understand many of the challenges and accomplishments of NASA as a whole, exposing its constituents to new ideas and projects that may not have been previously available.

As for my future endeavors, I plan to continue study in mechanical engineering at the graduate level with a possible focus in fluid mechanics or structural mechanics. I also intend on earning my PhD in a related mechanical engineering field, with hopes of conducting research and work with NASA. My interest in NASA had thoroughly developed while working on the Integrated Thermal Cargo Team at The Boeing Company. I was given the opportunity to cross-train at KSC and JSC during my internship, offering an intense and immerse view of the on-goings and achievements of NASA. From standing on level 255 of the Endeavour pad scaffolding in preparation for STS-126 to seeing the mass of employees who have devoted their lives to helping explore our universe, I had found myself not only grateful for the experience but simply inspired by the chance to learn something new, to explore the unknown, and to put my skills to good use.



## Elizabeth Sooby

### **Texas A&M**

College Station, Texas  
Applied Physics  
Doctor of Philosophy, May 2013



### **NASA Academy Research Project:**

*"Physical Model of an Annular Linear Induction Pump with Parametric Analysis"*

Principal Investigator: Kurt Polzin

### **E-mail:**

elizabeth.sooby@yahoo.com

### **Work Experience**

- **NASA USRP, Marshall Space Flight Center, Huntsville, AL**
  - Design and Fabrication of Einzel Lens for Enhanced Thrust Performance of a Hall Thruster
  - Analysis of Data Generated to Represent Oscillations in the Plume of a Hall Thruster
- **Physics Department, Millsaps College, Jackson, Mississippi**
  - Lab Assistant and Tutor
- **Office of Admissions, Millsaps College, Jackson, Mississippi**
  - Presidential Ambassador
- **Wilkins, Stephens, and Tipton, Public Attorney, Jackson, Mississippi**
  - Care Giver Identification

### **Memberships and Activities**

- Women's Varsity Soccer ( Team Captain Junior and Senior year)
- Chi Omega Fraternity
- Society of Physics Students

### **Honors and Awards**

- Omicron Delta Kappa (National Leadership Honorary)
- Sigma Lambda (Millsaps College Leadership Honorary)
- Pi Mu Epsilon (Math Honorary)
- Sigma Pi Sigma (Physics Honorary)
- Presidential Scholar-Fall 2007, Spring 2008, Fall 2008

### **Hobbies and Interests**

Roman Catholicism, soccer, reading Richard Feynman books, boating, camping, fishing

### **Personal Statement**

Ever since I was a child, I have been interested in technology, especially space exploration. My father took me to visit multiple NASA Space Centers across the South. We were at Alamogordo Space Center when the Pathfinder landed on Mars, and I have ever since been amazed at the footage and technologies developed at NASA. As NASA celebrated its 50<sup>th</sup> anniversary, it can truly be proud of the work it has done not only for our nation, but also for the world and science as a whole.

Through my previous experiences interning with the USRP program, I have been deeply inspired by the people who work at Marshall. Each one of them truly loves their job. Through this trying time we face, the people of Marshall are hopeful. While they may fear pay cuts or even job loss, their true concern lies in the fate of the program. We all dream of returning to the moon and going beyond. The people at Marshall are not just doing their job, but they are fulfilling a vocation. I anticipate joining the ranks of those called to work and fight for the desire to explore. Technology advancements should go beyond the Department of Defense. We should be innovating for something more exciting than merely "keeping up with the world."

NASA has been turning research into reality since its founding in 1958. I would appreciate the opportunity to work under and learn from the great minds of this organization, and I hope to pursue a career, if not with NASA, with an organization where I get to apply science to further our understanding of the vast world around us. My dedication to this academy will be no less than the dedication I have shown in all my other life experiences and intern opportunities at Marshall.



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**University of Michigan**

Ann Arbor, Michigan  
Aerospace Engineering and  
Materials Engineering  
Bachelors of Science, May 2010



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**NASA Academy Research Project:**

*“Fracture Toughness Testing for Upper Stage Allowables”*

Principal Investigator: Tina Malone

**E-mail:**

drdvd@umich.edu

**Work Experience**

- **Professor Pollock Research Group, Ann Arbor, MI**
  - Lab Assistant-Work for grad students preparing metallic samples for imaging, performing microstructure analysis on those samples, and giving presentations outlining analysis results
- **Student Space System Fabrication Lab, Ann Arbor, MI**
  - Helped manage the interaction between sub groups within the team
  - Helped design/build climbing robot and electromagnetic power transmission system
  - Created computational models for robot climbing

**Memberships and Activities**

- Eagle Scout
- University of Michigan Tae Kwon Do Team
- University of Michigan Ballroom Dance Team
- Order of the Arrow, boy scouts honor society

**Honors and Awards**

- AFS Past Chair Scholarship
- James W Freeman Memorial Scholarship
- Dean’s List Fall & Winter 2007
- John J Heller Memorial Scholarship
- Michigan Merit Scholarship

**Hobbies and Interests**

Hiking, sailing, outdoors.

**Personal Statement**

I want to attend the NASA Academy because I believe it will help prepare me for a career contributing to space exploration.

I am primarily interested in space structures and structural materials because I have been interested in the design of spacecraft and the materials used in them since early elementary school. I have chosen to pursue these interests because, by improving the design of a spacecraft or the properties of the materials used in constructing spacecraft, you can reduce the weight and volume of the structure, allowing for greater payload space and lowering costs. Such improvements will greatly benefit efforts to colonize the moon, send humans to Mars, and might have some direct terrestrial applications.

For over 10 years before going to college I was a member of the Boy Scouts of America, through which I learned team and leadership skills. Also before going to college, I participated in several space camp programs, gaining valuable team experiences.

After entering college I joined the MClimber team, which competed in the space elevator x-prize competition. Through the MClimber team I gained experience acting as an assistant engineering team leader, preparing design presentations and trade studies and helping design a complex system.

Since the summer after my sophomore year of college I have been doing research, with nickel base single crystal alloys, under a graduate student. For my research I prepare metal samples, image them, record data on certain micro-structural features with the aid of computer software, analyze data using a MATLAB program I helped develop, and present my findings in both formal and informal settings.

In the future I plan to earn a PhD that relates to space structures. After earning a PhD, I plan to secure a research and development position with NASA or an aerospace company designing space structures or developing and testing new structural materials for space applications.



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**University of Wisconsin-Madison**

Madison, Wisconsin  
Engineering Mechanics & Astronautics  
Bachelors of Science, May 2011

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**NASA Academy Research Project:**

*"Techniques for Oxygen Production from Lunar Materials"*

Principal Investigator: Peter Curreri

**E-mail:**

nwong@wisc.edu

**Academic and Research Experience**

- NASA Glenn, NASA ESMD Intern, Cleveland, OH
  - Researched CO<sub>2</sub> sensors for the new space suit
  - Developed and performed procedures to test the long term stability of a CO<sub>2</sub> sensor
  - Gathered data for modeling of the CRATOS rover
- Engineering Physics University of Wisconsin-Madison, Student Hourly
  - Build plasma actuators that produced a dielectric barrier discharge
  - Tested dielectric barrier charges for force and efficiency using LabVIEW

**Work Experience**

- Walzcraft Industries, Custom Cabinet Builder, La Crosse, WI
  - Manufactured custom made cabinet door fronts
  - Attained perfect attendance record for two summers

**Memberships and Activities**

- AIAA Wisconsin student chapter member
- Wisconsin Zero-G team member
- Intramural ultimate frisbee and tennis

**Honors and Awards**

- Vivian and Clayton Veum Scholarship-La Crosse Foundation
- WSGC Undergraduate Scholarship 09-10
- Outstanding Technical Communicator 08

**Hobbies and Interests**

Tennis, going out in nature.

### **Personal Statements**

I learned about NASA Academy my freshman year and knew it was something I would want to do just from reading about it. My sophomore year I was able to apply for an ESMD internship at NASA Glenn. I knew that working for NASA was something I wanted to do, and this was a good step towards achieving that goal.

Throughout that internship, other NASA internships were discussed. One of those was NASA Academy. I was able to ask more specific questions about NASA Academy, and it still sounded like it would fit into my academic and career goals, so I decided that next year I would apply for NASA Academy.

My work at NASA Glenn was purely research, and the leadership aspects of NASA Academy are what got me interested. Whenever there is a group project in a class, I always like to take the lead role. I feel confident in my ability to assess other peoples' strengths and use that information to get the job done efficiently and correctly.

My main interest is in in-situ resource utilization (ISRU). I believe that ISRU technologies will be a high priority if we want to have successful missions to the moon and Mars. I originally intended to work on ISRU at NASA Glenn, but the program was not available when I was working there.

I was able to do work with the Portable Unit for Metabolic Analysis (PUMA). This project was in a field that I had little experience in, but I think that helped me realize that I could put knowledge and problem solving skills I had learned in another field and put them to use and contribute in another field.

My future plans are to finish my undergraduate degree and apply to graduate school. I am still attempting to find a specific field that I would like to do graduate study on. NASA Academy will help me to learn more about engineering and sciences so that I can make a better decision about graduate school.

I enjoyed my time working for NASA so much that it is my number one career choice right now. I like knowing that I am using my talents to help my country and still enjoy the work I do.



### **Program Director**

#### *Dr. Frank Six*

Frank Six is a scientist in the Space Science Office at MSFC. He joined Marshall in 1986 as Deputy Project Scientist for Hubble, then became assistant to the Director of the Space Science Laboratory and then deputy to the Chief Scientist. He directed the Marshall Academies in 1994, 1995 and 1996, and led all university programs from 1989 to 1996. Before coming to Marshall, Frank worked for Cornell University as assistant to the director of the Arecibo Observatory. Prior to that, he taught physics and astronomy at Western Kentucky University where he was Chairman of the Department for 17 years. Upon receiving the PhD in physics from the University of Florida, Frank joined Brown Engineering in Huntsville, Alabama working on Apollo. His research areas are radio astronomy and planetary magnetospheres. He is married with six children and eight grandchildren and loves to explore the coastal regions of the Gulf of Mexico.

### **Program Manager**

#### *Dr. Gerald R. Karr*

Dr. Karr is a Professor of Mechanical and Aerospace Engineering at UAH. Since 1992, Dr. Karr has also served as the UAH Campus Director of the ASGC. Dr. Karr also served as the Chair of the Mechanical and Aerospace Engineering Department at UAH from 1986 through 1999. Dr. Karr has, since 1978, been the University Director of the highly successful NASA Summer Faculty Research Opportunity (NSFRO) program. Dr. Karr has also been an active researcher in the areas of satellite drag, high-energy lasers, cryogenics, spacecraft thermal design and computational fluid mechanics. Dr. Karr earned his BS (1964), MS (1966), and PhD (1969) in Aeronautical and Astronautical Engineering at the University of Illinois at Champaign-Urbana. For recreation, Dr. Karr enjoys golf, running, sailing and visiting with his children and grandsons.

## ***Operations Manager***

### *Ron Turba*

Ron is an alumnus of the 2007 NASA Academy at MSFC. He graduated in May 2009 from Worcester Polytechnic Institute with a Bachelor of Science in Aerospace Engineering and Physics. In August 2009, he will begin graduate studies at Vanderbilt University in Mechanical Engineering. His main research interest is in the field of propulsion. At the 2007 NASA Academy, Ron worked under PI Jim Spann with cameras for SUMI, a project to take pictures of the sun in order to map the magnetic field of the sun. In the future, Ron plans on pursuing a career as a rocket scientist. Ron enjoys the outdoors, playing sports, cooking, scuba diving, and spending time with friends. Ron's goals in life are to become an astronaut and live each day with a purpose.



## Links

- **NASA Academy:**  
<http://academy.nsstc.nasa.gov/>
- **NASA Academy Alumni Association:**  
<http://www.nasa-academy.org/>
- **NASA Agency:**  
<http://www.nasa.gov>
- **NASA Marshall Space Flight Center:**  
<http://www.msfc.nasa.gov/>
- **International Space University:**  
<http://www.isunet.edu>