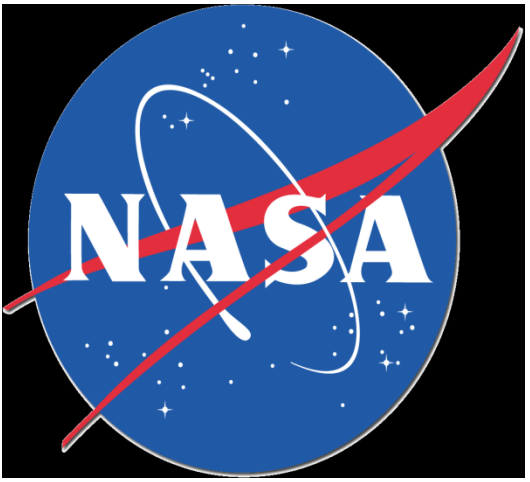
National Aeronautics and Space Administration

NASA Academy at Marshall Space Flight Center

Profile Book 2010



"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.

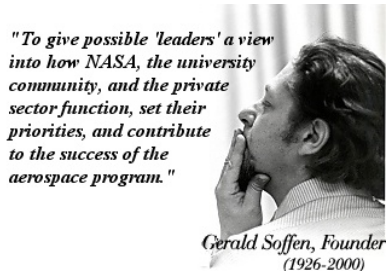
The NASA Academy program is designed to present a comprehensive package of information and experiences about the organization of the NASA agency, some of its most important current and planned science, engineering, education, and technology enterprises, as well as a number of non-technical areas of critical 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.

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.



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.

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.

Virginia Tech
Blacksburg, Virginia
Bachelor of Science in Materials Engineering, May 2012
E-mail: jageld@vt.edu

NASA Academy Research Project:
"New Materials for Space Exploration "
Principal Investigator: Tina Malone

Research and Experience

- Department of Materials Science and Engineering, Virginia Tech
  Undergraduate Researcher, *(Fall 2009-Spring 2010)*
  - Worked on the fabrication of titanium oxide nanotubes
  - Assisted research on nanoparticle templates
  - Worked up to 20 hours a week to help fund education
- ROXIE (Real Outreach Experiences in Engineering) Project, Angels of Assisi, Roanoke, VA, *(Spring 2009)*
  - Developed an online volunteer scheduling system
  - Incorporated engineering design method
  - Used of morphological charts, Pairwise Comparison charts, and selection matrices

Memberships and Activities

- Hall Council vice president
- Virginia Tech Union

Honors and Awards

- Dean's List with Distinction, Spring 2009
- Honors Housing, 2008-2010
- National Merit Scholarship, 2008
- Watauga High School Valedictorian, 2008

Skills

MATLAB	LabVIEW
MiniTab	Maple
Autodesk Inventor	MS Excel

Hobbies and Interests
Tennis, skiing, reading, computers

Personal Statement

I am a rising junior at Virginia Tech and am majoring in Materials Science and Engineering, with minors in Green Engineering and Psychology. My extracurricular activities include acting as the vice president of Hall Council for my dorm and participating in Virginia Tech Union. These past two semesters, I have also been conducting research on titanium oxide nanotubes with the Materials Science and Engineering department of Virginia Tech. My hobbies include playing tennis, skiing, and reading.

Dartmouth College
Hanover, New Hampshire
Electrical Engineering
Master of Science, June 2012
Bachelor of Engineering, June 2011
Hamilton College
Clinton, New York
Physics
Bachelor of Arts, May 2010
E-mail: valerie.s.hanson@gmail.com

NASA Academy Research Project:

"Analysis of Plasma Discharge Oscillations in a Hall-Effect Thruster"
Principal Investigator: Kurt Polzin

Research and Experience

- Hamilton College Physics Department, Clinton, NY
  Student Researcher (Summer 2009)
  - Studied digital signal processors, direct digital synthesis, and various data acquisition devices. ▪ Designed and built printed circuit boards.
  - Designed and built printed circuit boards
  - Designed and tested an automated diagnostic device for measuring ^{3}He polarization.
  - Gained general laboratory experience and exposure to machine shop and electrical work.
- Oak Ridge National Laboratory, Oak Ridge, TN
  U.S. Department of Energy Higher Education Research Experiences Participant (Summer 2008)
  - Constructed an optically pumped 3He neutron polarizer.
  - Researched, designed, and tested method to efficiently measure absolute 3He polarization.
  - Trained to operate a class 4 laser.
  - Successfully completed radiological worker training.
  - Gained general laboratory experience and exposure to machine shop and electrical work.
- Hamilton College Peer Tutoring Program
- Johns Hopkins University Center for Talented Youth
  Principles of Engineering Design Teaching Assistant (Summer 2007)

Memberships and Activities

- Hamilton College Women's Rugby - Captain
- Dartmouth College Women's Rugby
- College Math Literacy Worker for Young People's Project at Hamilton College

Honors and Awards

- Graduated Summa Cum Laude (May 2010)
- Phi Beta Kappa Honor Society (May 2010)
- Sigma Xi Scientific Research Society (May 2010)
- Physics Concentration Honors (May 2010)
- The Southworth Prize in Physics (May 2010)
- The Leo Mackta Prize in Physics (August 2008)
- The G. Harvey Cameron Prize (May 2008)
- Dean's List

Skills

- C/C++
- Emacs
- ExpressPCB
- Igor Pro
- Latex
- Linux/Unix
- Maple
- Matlab
- Microsoft Excel
- Microsoft Powerpoint
- Microsoft Word
- PSpice
- Python
- SolidWorks
- Xilinx

Hobbies and Interests

Spending time with family, photography, digital image and video editing, playing guitar, traveling, playing sports, bowling, and kayaking.

Personal Statement

I have been interested in science, and more specifically electronics, since I was a child. My grandfather nicknamed me Buttons, because I was always pushing buttons and fiddling with whatever electronic devices were within reach. While my career interests are deeply rooted in science and engineering I felt I needed to develop a strong background in other fields as well, so upon entering college I chose to pursue an engineering degree via a liberal arts institution. I recently graduated from Hamilton College with a B.A. in physics, and this fall I will return to Dartmouth College to complete the B.E. degree that I began working towards my junior year when I first enrolled in the dual degree engineering program. Beginning in January 2011 I will begin conducting research and taking classes towards the M.S. degree, which I hope to complete no later than June of 2012. I have been keeping an open mind about potential careers and locations so as not to limit my options. Ideally I am searching for a career that incorporates all of my knowledge and interests, and is mentally stimulating and challenging.

University of Alabama
Tuscaloosa, Alabama
Material Science
Ph.D. Candidate
Louisiana State University
Bachelors of Science, Electrical Engineering, 2002
E-mail: rhorton@mint.ua.edu

NASA Academy Research Project:

"3D Deformation and Strain Analysis in Friction Stir Welded Aluminum using Image Correlation "
Principal Investigator: Tina Malone

Research Interests

- Graded magnetic recording media
- Physics of Materials
- Bit patterning utilizing Focus ion beam assisted chemical anodization
- Chemically synthesized magnetically manipulated quantum dots and quantum rods

Teaching Experience:

- Lead Science Teacher Community School of Apprenticeship Learning, Baton Rouge, La
- Lead Graduate Teaching Assistant for the Physics Dept at the University of Alabama
- Summer Instructor Physics I and II, Stillman College, Tuscaloosa, Al
- Evaluation of Studio/non Studio Physics classes, University of Alabama

Presentations

- Seminar Speaker University of Southern Mississippi, Hattiesburg, Ms, March 6, 2009
- Physics Diversity Summit, National Society of Black Physicists, Nashville, TN Feb 11, 2009
- K. Renee Horton (2008) Invited. Creating a viable Woman's working Group. 3rd IUPAP WIP conference. Seoul, Korea
- K. Renee Horton (2008) Invited. Commencement/Founder's day speaker University of Maryland Eastern Shores, Sept. 16, 2008
- K. Renee Horton (2008) Invited. The Eye of the Storm: Balancing my storm of family, career and self. American Physical Society March Meeting. March 11, 2008
- K. Renee Horton (2006). Magnetically Manipulated Quantum Dots (MMQD). NASA Goddard Space Flight Center (GSFC) Graduate Student Research Program Symposium (GSRP). September 22, 2006
- K. Renee Horton (2006). Invited. Women Physicist of color achieving at the intersection of race and gender. American Physical Society March Meeting. March 15, 2006.

- K. Renee Horton (2006). Invited. NSBP International Activities – 2nd IUPAP International Conference on Women in Physics in Rio de Janeiro, Brazil. February 18, 2006.
- K. Renee Horton (2004). Invited. Outreach Opportunities in Renewable Energy. Renewable Energy Academic Partnership (REAP) Conference, Coca, Florida, August 13, 2004

Poster Presentations

- K. Renee Horton, S. Kang, G. Mankey and JW Harrell (2008) Anisotropy Graded Media: Extending the superparamagnetic limit. (1)IEEE Magnetics Summer School, Colorado Springs, CO. August 3-8: (2)3rd IUPAP International Conference on Women in Physics, Seoul, Korea. Oct 10-12. (3)University of Alabama, Materials for Information Technology (MINT) Fall Review. Oct 12-14, 2008
- K. Renee Horton and J.W. Harrell (2008) Anisotropy Graded Media. Marie Currie PSK-I Surface Interaction Summer School, Costa Brava, Spain May 12-15.
- K. Renee Horton (2006). Evolution of the MINT Scientific Outreach Program (MINT SOUP) University of Alabama, Materials for Information Technology (MINT) Fall Review. Oct 22-24, 2006
- K. Renee Horton (2006). Synthesis and Characterization of CdSe-Co Core-Shell Quantum Dots and Rods. University of Alabama, Materials for Information Technology (MINT) Fall Review. Oct 22-24, 2006
- K. Renee Horton (2005). Women Physicist of color achieving at the intersection of race and gender. Poster- 2nd IUPAP International Conference on Women in Physics in Rio de Janeiro, Brazil. May 24, 2005

Fellowships and Awards

- Goddard Space Flight Center Graduate Student Research Program (GSRP) Fellowship 2004-2007. Includes a $3000 supply and $3000 travel budget.
- Southern Regional Educational Board (SREB) Fellowship 2005-2008
- Community Based Partnership Student initiated outreach award $2000 (2008)
- National Alumni Fellow University of Alabama 2008-2009
- Harriet G. Jenkins Predoctoral Fellowship 2008-2011
- Co-PI NSF grant PHY-0824634 for $138,180.00 2008

Professional Service

- Co-editor proceedings 3rd International Pure and Applied Physics (IUPAP) Women in Physics Conference. Seoul, Korea Oct. 10-12, 2008
- Program Committee (2004 - Present) ; Chair of Women in Physics Committee (2007-Present): Member National Society of Black Physicists
- Member of the 2005 US Delegation Team for the 2nd IUPAP Conf on Women in Physics (2005). Co-Leader US Delegation Team for the 3rd IUPAP WIP (2008), Member of the IUPAP Women's working group in Physics

Society Membership

American Physical Society, The American Physical Society Topical Group on Magnetism and its Applications (GMAG), Tuscaloosa Alumnae Chapter, National Society of Black Physicists

Williams College
Williamstown, Massachusetts
Astrophysics
Bachelor of Arts with honors, June 2010
E-mail: EmmaLehman@gmail.com

NASA Academy Research Project:

"Spectroscopic Studies of Europa's Tenuous Atmosphere"
Principal Investigator: Melissa McGrath

Research and Experience

- Research Assistant, Williams College
  - Reduced raw planetary nebulae (PNe) spectra using IRAF
  - Processed PNe spectral data to determine chemical abundances.
  - Analyzed the data in the context of a broader data set and found an Ionization Correction Factor (ICF) for oxygen abundances in PNe.
  - Wrote a program in Python to sort through parameter models to find the best model (set of parameter values) for a given nebula.
  - Published and presented a paper at the 2009 Keck Astronomy Symposium.
- Honors Thesis, Williams College
  - Obtained spectra of previously unobserved PNe in the halo of Andromeda Galaxy using the Gemini North telescope on Mauna Kea in Hawaii and the Apache Point 3.5 meter telescope in New Mexico
  - Reduced and analyzed data with IRAF software package
  - Found that oxygen may not be a reliable indicator of iron abundances in low-metallicity environments, possibly due to higher efficiency of oxygen enrichment in stars with low mean molecular weights.
- Research Assistant, Swarthmore College, Swarthmore, PA, Summer 2008
  - Studied young stars with transition disks to look for planetary systems.
  - Co-wrote a program in IDL that that analyzes radial velocity data from transition disk stars and uses Bayesian Analysis to determine the probability of the presence of a planet.
  - Published and presented a paper at the 2008 Keck Astronomy Symposium.

Memberships and Activities

- Astronomy and Astrophysics Teaching Assistant
- Hopkins Observatory and Planetarium Head Teaching Assistant
- ScientEPHic Quarterly Features Editor
- Writing Workshop Tutor and Chairperson
- Student Symphony - violin

Honors and Awards

- Senior Thesis Honors
- Sigma Xi
- National Merit Finalist

Publications

- Lehman, E., Luger, R., "Understanding Protoplanetary Disk Clearing in Young Stars", Keck Northeast Astronomy Consortium, 2008.
- Koontharana, A., Lehman, E., "Planetary Nebulae: Unlocking the Secrets of Galaxy Formation", Keck Northeast Astronomy Consortium, 2009.

Skills

IRAF, IDL, UNIX, Python, Java, C, Microsoft Word, Excel, PowerPoint, Mac O/S

Hobbies and Interests

Tennis, cross-country skiing, hiking, rowing, violin, writing, amateur astronomy.

Personal Statement

I decided at a young age that I wanted to be a writer, but I fell in love with physics in high school and never looked back. I have always been captivated by astronomy, and as I continue to study it I become even more fascinated by the mysteries of space, and our potential to understand them through technology.

My undergraduate research focuses on planetary nebulae (PNe). By calculating chemical abundances for PNe throughout the Galaxy and beyond, we can constrain theories of galaxy formation. I have also worked at Swarthmore College via a grant from the Keck astronomy consortium, studying cleared disks around young stars to look for evidence of early planet formation. Both of these projects involved trying to find a clever way to get as much information as possible out of imperfect data. Challenges like this are my favorite part of the research process.

In addition to observational astronomy, I am very interested in engineering and instrumentation. I have enjoyed being a teaching assistant at the Williams College observatory, where I help students operate our telescopes and image reduction software. I was also trained to perform basic operations on the Gemini North telescope on Mauna Kea in Hawaii when I had the opportunity to observe there for my thesis research. I like working with complex technical systems like these, and I also enjoy programming and writing about science. I hope to find a career in the space industry that combines my love of astronomy research and instrumentation.

Marquette University
Milwaukee, Wisconsin
Engineering Management
Master of Science, Dec 2010
University of Michigan
B.S., Earth System Science and Engineering, May 2009
E-mail: jmcgrail@umich.edu

NASA Academy Research Project:

"Microsats to monitor the High North and Arctic"
Principal Investigator: Marty Kress

Work Experience

- Laboratory for Atmospheric and Space Physics, Colorado University, Boulder, CO
  *Research Assistant (*Summer 2008)
  - Performed Magnesium II (Mg II) Index Comparisons using IDL
  - Processed measurements from satellites into a form to be read by IDL programs
  - Found correlations of Mg II index with other measures of solar variability
  - Created a continuous record of Mg II readings by combining data from multiple satellites over several decades
  - Using this record, I created a Mg II index which predicted solar variability more accurately than the National Oceanic and Atmospheric Administration's (NOAA)
- High Altitude Balloon with Electric Field Sensor
  - Goal was to show that electric field measurements can be taken from a balloon
  - Worked with engineers from many different disciplines, received input from professional scientists and engineers
  - Payload contained multiple systems such as communication, navigation, and scientific measurements
- Outpatient Pharmacy Analysis
  - Goal was to compare the 3 pharmacies and make recommendations for improvement in prescription delivery time
  - Used tools such as failure mode and effect analysis (FMEA), process flow diagrams, root cause analysis, and fish bone diagrams to rank each step in the delivery process with a risk priority number
  - Using these rankings, the team came up with recommendations to improve and standardize the 3 pharmacies
  - Presented these recommendations along with all our work to the heads of the pharmacy

Memberships and Activities

- Men's Club Varsity Crew Team – University of Michigan
- Detroit Area Pre-College Engineering Program instructor
- Junior Golf instructor
- Officiating intramural sports

Skills

Languages

- Experience with C++, IDL, FORTRAN

Software

- MATLAB, MAPLE, some LabView, Microsoft Office: Word, Excel, Powerpoint, Visio, Project

Operating Systems

- Windows, also comfortable with Mac OS

Hobbies and Interests

I love golfing. I enjoy swimming, and most other sports. I also like to watch movies.

Personal Statement

I want to work in the space industry. I feel that I am well prepared to enter this field because of my engineering background, which is in the space sciences and engineering fields. I have a Bachelors of Science and Engineering degree from the University of Michigan and am now pursuing a Master of Science degree in Engineering Management from Marquette University. I have taken classes from many different engineering fields and have worked on projects that bring together all of these fields. I have experience with electronics, lab work, technical writing and computers. In addition to these technical skills, I also have experience with lean concepts, failure mode and effects analysis, along with teamwork and leadership.

University of Washington
Seattle, Washington
Aeronautics and Astronautics
Master of Science, June 2011
Tufts University
B.S. in Mechanical Engineering and Physics, May 2009
E-mail: LParit@gmail.com

NASA Academy Research Project:

"Supporting Research and Development for an Autonomous Lunar Lander"
Principal Investigator: Marty Kress

Research and Experience

- Fusion Propulsion Laboratory, University of Washington
  Graduate Research Assistant (10/2009-Present)
  - Researching the plasma physics behind fusion energy and electric space propulsion
  - Designing a spectrometer to be used for determining 3D velocity flow fields within plasmas
  - Modeling current and proposed space propulsion systems to determine promising areas of research
- Draper Laboratory, Cambridge, MA
  Systems Engineering Intern (9/2009-5/2009)
  - Electrically modeled a three phase torque motor used in an inertial navigation system
  - Created a suite of scripts for processing experimental data from an inertial measurement unit

  Engineering Design Intern at MIT Computer Science and Artificial Intelligence Lab (5/2008-5/2009)
  - Supported research and development for an Army-funded autonomous forklift
  - Designed and fabricated a half-scale robotic forklift
  - Reverse engineered and converted an existing commercial forklift to full computer control
  - Programmed algorithms to control the steering and braking systems

  Electromechanical Engineering Intern (5/2007-5/2008)
  - Designed and built a pulse width modulating control circuit for a servo
  - Implemented a speed control system for a motor
  - Debugged and integrated various electrical and mechanical systems
- Boston University Photonics Center (NSF REU Program), Boston, MA
  Physics Research Assistant (5/2006-8/2006)
  - Conducted numerical simulations of particle orbits in Hydrogen atoms
  - Wrote computational analysis programs and a GUI using C++ and Java

Publication

Shultz MJ, Kelly M, Paritsky L, Wagner J. A Theme-Based Course: Hydrogen as the Fuel of the Future. *Journal of Chemical Education*. 2009; 86(9):1051.

Honors and Awards

- ARCS Fellowship Recipient
- Graduated Magna Cum Laude from Tufts University
- Accepted into Tau Beta Pi
- Member of the Dean's List, all four years at Tufts University

Computer Skills

Platforms:	Windows, Linux (Ubuntu, Fedora), OS X
Software:	MATLAB, Simulink, SolidWorks, COSMOSWorks, AutoCAD 2D/3D, LabView, Mathcad, Mathematica
Languages:	C, C++, Java, Visual Basic, HTML

Language Skills

Fluent in English and Russian, intermediate in Spanish

Hobbies and Interests

Playing soccer, volleyball and tennis, practicing guitar, hiking, exploring new cities

Personal Statement

My passion for engineering began at an early age. Combing through spare computers and electronics, one of my first home projects was building a projector out of an old laptop LCD, a broken halogen lamp and a desk magnifier. I began with the innocent intention of screening movies in the basement, but the thrill of hands-on engineering and experimentation struck a chord with me. I was hooked on inventing, designing, building and my ardor for space exploration soon followed. Space is a frontier that pushes scientific, technological and even philosophical boundaries to their breaking points. I wanted to thrive in this constantly-innovating industry and I tried to prepare myself early on. I experimented with robotics and sensors while developing an autonomous forklift with MIT. I learned the basics of electronics while designing and building motor controllers during a summer with Draper Laboratory. My senior year, I seized the opportunity to start a design team geared towards the development of a prototype rover capable of collecting rocks in a simulated Mars environment. Throughout all of my projects and endeavors, I have sought to augment my coursework with practical experience. Now a graduate student at the UW, I am part of a research lab working towards realizing fusion as a power source and exploring alternative means of space propulsion. I am currently designing a spectrometer that will be used to determine 3D velocity flow fields within plasmas, as well as working on a systems model of current space propulsion methods.

With the shuttle program coming to an end and the uncertain restructuring of NASA, the space industry is on the forefront of an exciting new challenge. I hope to be a part of it and apply myself in an interdisciplinary environment filled with people who share my passions for science, engineering, and space exploration.

University of Kentucky
Lexington, Kentucky
Mechanical Engineering
Bachelors of Science, Dec 2011
E-mail: daniel.polston@uky.edu

NASA Academy Research Project:

"Evaluation of Regenerative Carbon Formation Catalyst"
Principal Investigator: Morgan Abney

Reseach and Experience

- NASA Marshall Space Flight Center, Huntsville, AL
  Undergraduate Student Research Program (USRP) (09/2009 – 12/2009)
  Environmental Control and Life Support Systems Development Branch
  - Conducted 50+ hours of testing with carbon dioxide reduction technology
  - Regulated chemical and thermodynamic properties via Lab View software
  - Gained practical experience with chemical engineering processes
  - Designed parts using Pro/ENGINEER while applying specified standards
  - Machined components using manual milling machines
  - Composed technical report detailing the research and investigation on current carbon dioxide reduction technology
- Schneider Electric (Square D), Lexington, KY
  Assembly Line Employee, (6/2008 – 8/2008)
  - Assembly of safety switches used in commercial and industrial settings
  - Molding of fusible and non-fusible bases
  - Worked daily with a group of 10+ people ranging from the ages of 18-70+

Memberships and Activities

- FIRST LEGO League (FLL) , Jr. LEGO robotics volunteer judge, 2009
- Christian Student Fellowship, Leader, 2008-2010
- Intramural Sports, Frisbee, 2009-2010
- Habitat for Humanity, Volunteer, 2008/2009
- Jesus Prom – annual dance for special-needs people – Volunteer, 2005-2009

Honors and Awards

- Dean's List , 2007-2010
- Oliver H. Raymond Engineering Scholarship, 2009
- E. Field White Memorial Scholarship, 2008
- Flagship Scholar, 2007
- Scholar Athlete of the Year Award (regional), 2007

Skills

- Experience with CATIA and Pro/ENGINEER Wildfire design software
- Designed parts using Pro/ENGINEER (2009)
- Worked with CATIA in modeling of mechanical parts (2008)
- Introduced to C++ coding (Microsoft Visual Studio)

Hobbies and Interests

Listening to music as well as making my own via computer software. I enjoy playing sports: ultimate Frisbee, baseball, and disc golf. I am thinking about entering in a few amateur disc golf tournaments in the future. I enjoy playing the casual card or board game. I am a rollercoaster junkie – theme parks are my favorite vacation spot – and I could ride them all day long.

Personal Statement

Sitting in the midst of today's fast-paced, technology-driven world, I continually conjure up ideas as to how *I* could fabricate change. Sure, I am merely one young adult; but, my lack of age is eclipsed by my self-determination, logical reasoning, and firm work-ethic. As a continuing Mechanical Engineering student at the University of Kentucky, a previous NASA Undergraduate Student Research Program intern, and a current NASA Academy member, I have developed solid foundations in leadership, communication, and analytical skills.

Mechanical Engineering will allow me to relate subjects learned in college to any specific career position potentially pursued. I plan on completing my bachelor's degree and then furthering my education by acquiring a master's degree most likely continuing with mechanical engineering with a focus in the design and development area of the space and aeronautics field.

Ever since watching Carl Sagan's Cosmos PBS series as a kid, I have been interested in anything space-related. The unanswered questions of the universe have fueled my imagination capabilities by realizing the potential that any idea could provide a new breakthrough. Reliving the previous achievements in the space and aeronautics fields – whether through television, museum, movie, speaker or other mediums of the like – have created a lifelong inspiration for exploration, discovering, and understanding.

My life's ambition has always been to succeed; yet, no matter how strenuous the path of success, I must enjoy what I do. Even as a young kid building castles out of LEGOs, out-of-the-box thinking and problem solving have correlated with my actions and persona. As an engineer in a space-related field, I will get to connect what I've always enjoyed doing – designing, thinking, and creating – with a lifelong career.

New Mexico State University
Las Cruces, New Mexico
Physics
Bachelor of Science, May 2012
E-mail: eramesh@nmsu.edu

NASA Academy Research Project:

"Analyzing CCD images of Asteroids & Comets"
Principal Investigator: Bill Cooke

Research and Experience

- NASA Planetary Data Systems (PDS) Atmospheres Node, NMSU
  Research Assistant
  - Responsible for cataloging and updating of online atmospheric data volumes from various NASA probes.
  - Utilized Unix, Perl, IDL and C++ to maintain and improve online library (www.atmos.nmsu.edu).
- NASA MSFS and Apache Point Observatory
  LCROSS Impact Observational Assistant
  - Assisted Dr. Rob Suggs (NASA Marshall) & Dr. Nancy Chanover (NMSU) on the 3.5 meter SLOAN telescope (APO) to image and record the impact of the LCROSS probe onto the lunar surface.
  - Relayed updates to and from NASA Ames Center and between 3.5 meter, 1 meter & .6 meter observatories. Logged all pertinent information. Also assisted during practice runs on 8/09, 8/10, & 10/08.
- Aggie Vision, NMSU, New Mexico
  Graphics Operator
  - Responsible for all stats and information, presented graphically during NMSU Athletics events, broadcast on Fox Sports AZ and Comcast.
  - Used Final Cut Pro on Mac OS and later the Chyron system to update stats for director's approval.

Memberships and Activities

- Academic honor society member, *National Society of Collegiate Scholars*, current President of NMSU Chapter
- Completed Undergraduate Research project, 'Investigating Spiral Galaxies Along the Hubble Sequence', mentored by Dr. Jon Holtzman (NMSU Astronomy)
- Presented research 'The Roller Coaster Relationship Between Art & Science' via power point at NMSU 2010 URCAS (Undergraduate Research & Creative Arts Symposium).
- Wrote and directed science documentary, 'The Evolution of the Telescope'
- Member, Society of Physics Students

- Accomplished amateur astronomer (Viewed Mars through the 60-inch telescope at Mount Wilson. Also viewed 98 of 110 Messier objects).

Honors and Awards

- Designated Crimson Scholar, University Honor Student, Fall 2008
- Dean's List, NMSU, Spring 2008

Skills

Type 60 wpm, proficient in IDL, Linux/Unix Environment, Microsoft Word, Excel & Power Point, Final Cut Pro.

Hobbies and Interests

Writing fiction (nine screenplays and one full-length science fiction novel written), stargazing with my two telescopes, watching ice hockey (NHL) and football (NFL), Japanese Anime, laidô (Samurai art of sword techniques) and playing the electric guitar.

Personal Statement

For me, science is the ultimate search for truth. The challenge of space exploration provides a tantalizing journey that expands our horizons while uplifting and improving humanity. It is a challenge I will relish.

University of Mississippi
University, Mississippi
Chemical Engineering
Bachelors of Science, May 2012
E-mail: dnreinem@olemiss.edu

NASA Academy Research Project:

"Investigations of Different Catalysts in Space Exploration Life Support Recovery Systems"
Principal Investigator: Jay Perry

Research and Experience

- Physical Chemistry Research Assistant, University of Mississippi
  - Researched literature such as scientific journals, articles, abstracts, etc.
  - Developed skills in taking both infrared and Raman spectroscopy to analyze MIDA-protected boronate esters and different coal samples for a departmental collaboration
  - Utilized the results of electron configuration calculations performed in Gaussian 03 as a guide to find different vibrations and compare between the computational and experimental results
  - Analyzed the boron-nitrogen stretching motion and recorded the lowest frequency to date, 544 cm^{-1}
  - Developed skills in LabView 8.5 to write computer programs to subtract fluorescence background from input data
  - Analyzed and manipulated data in Igor Pro and Excel

Publications

- Vibrational Spectroscopy of *N*-Methyliminodiacetic Acid (MIDA)-Protected Boronate Esters: Assignment of the B-N Dative Bond Stretching Frequency; Reinemann, Wright, Howard, Tschumper, Hammer. Southeastern Regional Conference of the American Chemical Society, Poster Session 2009.
- Computational and Raman Spectroscopic Studies of *N*-Methyliminodiacetic acid (MIDA)-Protected Boronate Esters; Reinemann, Wright, Tschumper, and Hammer. Mississippi EPSCoR Poster Session 2010
- Raman and SERS Spectroscopy of *N*-Methyliminodiacetic acid (MIDA)-Protected Boronate Esters; Reinemann, Wright, Wolfe, Tschumper, Hammer. International Conference on Raman Spectroscopy, Boston, MA, to be presented August 12, 2010.

Memberships and Activities

- American Chemical Society 2009-2010
- American Institute of Chemical Engineers (AIChE) 2008-2010 (*Secretary 2010-2011)*

- AIChE ChemE Car Team 2009-2010
- Engineers Without Borders 2009-2010 (*Treasurer 2010-2011)*
- Habitat for Humanity 2010
- Society of Women Engineers 2009-2010
- MS Lions All-State Band: Tour 2008 New York, NY and Washington, D.C
- Pride of the South Marching and Concert Band 2008 – 2010, First Trumpet
- Sally McDonnell Barksdale Honors College 2010
- Sigma Alpha Iota-International Music Fraternity for Women 2008-2010 (SAI Philanthropies: Helps underprivileged music students with supplies, monetary assistance, and spread the benefits of music education) (*Treasurer 2009-2010, Vice President-Ritual 2010-2011)*

Honors and Awards

- Alpha Lambda Delta Freshman Honor Society
- Outstanding Freshman in Chemical Engineering for 2009
- Chancellor's Honor Roll 2008- 2010
- Dean's Honor Roll 2009 – 2010
- Tau Beta Pi Engineering Honor Society (*Treasurer 2010-2011)*

Skills

Microsoft Word, Excel, PowerPoint; Mathcad 14; Mathematica 7.0; LabView 8.5; Igor Pro; Linux/Unix environment; GaussView; Gaussian 03; Fortran 1995/2003; Some fluency in Spanish; SSH Secure Shell Client; Endnote

Hobbies and Interests

I play trumpet for the university band and also play for community events like Memorial Day celebrations, etc. In my spare time, I also enjoy shooting skeet or targets, going to Ole Miss football games, playing tennis, traveling, and hanging out with friends and family.

Personal Statement

Having the opportunity to work for the NASA Academy has really opened my eyes to how an engineer has to tackle various problems and figure out viable solutions in the workplace. Problem solving, in my opinion, is one of the most gratifying tasks, not to mention the fun, in this field. This is one of the main reasons why I wanted to become an engineer, and taking part in that experience while in the NASA Academy program has been extraordinary. However, I also have a love for the science behind all of the issues, so I am going to declare a second major with a Bachelor of Arts in Chemistry when I return to school. I enjoy the aspects of both of the concepts of research and development, and that kind of work is what I am hoping to get into someday. I also hope to further my education by getting a Masters in chemical engineering and maybe even a PhD if the opportunity arises.

University of Arizona
Tucson, Arizona
Optical Sciences and Engineering
Bachelors of Science, May 2012
E-mail: kyle824@email.arizona.edu

NASA Academy Research Project:

"Using Remote Sensing Techniques to Identify Various Archeological Sites Around the World"
Principle Investigator: Tom Sever

Research and Experience

- NASA Space Grant Intern, *Tucson, AZ*
  - Working in a team environment with peers and professionals to design, construct, and test both large and small scale solar concentrators in order to develop more efficient solar power
  - Conducting research and devising methods to test, control, and prevent damage to various optical devices
- NASA Undergraduate Student Research Program (USRP), *Huntsville, AL*
  - Assembled a database including 29 space telescopes and 59 cost, technical, and programmatic parameters for single and multivariable cost model analysis
  - Assisted with calibration measurements of the Absolute Distance Meter used in measuring the radius of curvature of James Webb Space Telescope Primary Mirror Segment Assemblies
- Lisa Frank, Inc., *Tucson, AZ*
  - Initiated contact with large corporations in an effort to settle various accounting disputes

Memberships and Activities

- Students for the Exploration and Development of Space *(August 2007 - Present)*
  - UA Chapter President (Fall 2008 – Present); UA Chapter Treasurer (Spring 2008)
  - Conference Director for SEDS National Conference in 2009 with 175 attendees and 25 speakers
- University of Arizona Engineering Ambassador *(Fall 2008 – Present)*
  - Representing the U of A's College of Engineering in various public forums, giving detailed and accurate information about the College in an attempt to recruit incoming Freshmen
- Honors College Paladins Preceptor *(Fall 2009)*
  - Individually taught a class of seventeen students about skills for success in college

- University of Arizona Orientation Leader & Resident Assistant *(Summer 2008)*
  - Informed groups of 30 – 40 incoming students about campus policies, expectations, and responsibilities
- Volunteer Work *(2005 – Present)*
  - Mentored 7th & 8th grade youth in lower income areas of Tucson through Project ACHIEVE
  - Educating and inspiring the community through public outreach with the SEDS 18" Dobsonian telescope
  - Telescope operator at the local planetarium

Honors and Awards

- SEDS Outstanding Student of the Year (2009)
- Dean's List with Distinction (Spring 2008)
- Dean's List (Fall 2007)
- University of Arizona President's Award for Excellence (2007-Present)
- Scholar of the Year (2006)

Skills

AutoCAD (2D and 3D work), SolidWorks, HTML, Java, Photoshop CS4, ZEMAX, MATLAB

Hobbies and Interests

- Photography and Photo Editing
- Telescopes and Amateur Astronomy
- Manned Spaceflight
- Promoting interest in space

Personal Statement

I have always had a general interest in space, but it wasn't until I entered college that I truly pursued that interest. Since my Freshman year, basically everything I have done has revolved one way or the other around space. Whether it was becoming President of the University of Arizona chapter of Students for the Exploration and Development of Space (SEDS), leading the SEDS national conference, completing the construction of a large Dobsonian telescope, becoming a volunteer telescope operator at the local planetarium, or simply sharing my enthusiasm for space with others, my early interest has become quite more than just a hobby.

I hope to gain a career related to space exploration upon the completion of my education, whether it is working for NASA or the private sector. I am currently trying to gain as much experience as possible as a student through internships and volunteer opportunities in order to make an informed career choice when the time comes.

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

Matthew Duchek

Matthew is an alumnus of the 2009 NASA Academy at MSFC. He graduated in May 2010 from the University of Illinois at Urbana-Champaign with a Bachelor of Science in Aerospace Engineering and a Minor in Physics. In August 2010, he will begin graduate studies at the University of Colorado at Boulder in Aerospace Engineering Sciences with a concentration in Bioastronautics. His main research interest is in the field of propulsion. At the 2009 NASA Academy, Matthew worked under PI Morgan Abney with catalysts for carbon dioxide reduction for future environmental controls and life support technologies. In the future, Matthew plans on pursuing a career working with design of spacecraft for manned missions. Matthew enjoys camping, hiking, playing his guitar, and getting to know new people. Matthew's goals in life are to bring the wonders of space a little closer to us here on Earth and to live with joy and purpose.

- *NASA Academy:*
  http://www.nasa-academy.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
- *The Soffen Memorial Fund:*
  http://www.nasa-academy.org/soffen/donors.html