



NASA PROPULSION 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 Propulsion Academy, at the Marshall Space Flight Center, is a 10-week, residential summer research and educational experience for high achieving sophomores, juniors, seniors and graduate students interested in propulsion. The emphasis is on preparing young professionals for employment in aerospace positions. Propulsion is the critical element in NASA's exploration program. The new Ares propulsion elements are being designed and developed by engineers at the Marshall Space Flight Center (MSFC) and by its contractors. We are utilizing this development as a training ground for university students who are interested in careers in this exciting field. Research Associates (interns) will work in teams of four, guided by propulsion engineers at Marshall, local commercial entities and local universities. Each team is composed of a "team lead" and three research associates. The team lead is an advanced undergraduate or graduate student with a curricular background in courses relevant to propulsion. The research associates are sophomores, juniors and seniors who aspire to becoming graduate propulsion engineers. Site visits, tours and lectures will demonstrate the various opportunities for employment in the space propulsion field. These visits will expose the research associates to state-of-the-art propulsion development. Tours of local facilities and lectures by experts in propulsion will provide one-on-one interaction with practicing propulsion engineers.

Eligibility, Selection Criteria, and Placement

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

- US citizenship or permanent residency
- Research Associates: Rising college sophomores, junior or seniors
- Team Leads: junior and senior undergraduates or graduate students with a curricular background in propulsion
- High academic standing (GPA 3.0 or higher)
- Demonstrated prior involvement in propulsion

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.

Solid Rocket Nozzle Design, Testing, and Material Development: Alternate Design for Lunar Braking Motor

ER50 is teaching an internal class on the Fundamentals of Solid Rocket Propulsion in June. The interns attend this class and then have a project to design an alternate design for the Lunar Braking Motor (ILN Program). Each intern will work in a specific area. These areas include solid motor ballistics, solid motor propellant, solid motor case joints and seals, solid motor nozzle, and case liner/insulation.

Principal Investigator: *Stan Tieman*

Team Lead: *Isaac Detrinidad*

Research Associates: *Juan Gabriel Cruz-Ayoroa*
Ty Morton
Carrie Simmons

Purdue University

West Lafayette, Indiana
Aerospace Engineering
Bachelor of Science, May 2010

E-mail: idetrini@purdue.edu



Academic and Research Experience

- ***High Pressure Propulsion Laboratory, Purdue University, 2008***
Conducted research on throttleable hybrid rocket motor development to achieve controllable, variable thrust propulsion. Assembled instrumentation panels for use in Rolls Royce's Supersonic Business Jet and Wave Rotor projects, and NASA's Multi-Element Rocket Combustion experiment. Manufactured fuel, electrical, and high pressure equipment in support of rocket and aircraft engine testing. Supported daily test facility build-up and operations.

Work Experience

- ***Aircraft Power Plants Mechanic, San Diego, CA, 1998-2007***
Performed and supervised complete repair of 120 gas turbine engines and related modular systems. Controlled production of engine assets and supervised 110 personnel. Interpreted shop sketches, drawings, schematics, and blueprints.
- ***Aviation Supply Operations Supervisor, San Diego, CA 1987-1998***
Managed a \$440 million organizational account that consisted of computer assets, aeronautical support equipment, and office supplies. Furnished logistics support to 18 aviation organizations through the management and operation of aeronautical material. Planned, prepared, and deployed six times outside the continental United States, to include two combat tours.

Memberships and Activities

- Golden Key International Honor Society
- Phi Theta Kappa International Honor Society
- Aeronautical and Astronautical Engineering Student Advisory Council
- Sigma Gamma Tau National Aerospace Engineering Honor Society
- Tutored 75 students in mathematics, science, and engineering courses

- 15 academic scholarships

Skills and Certifications

- MATLAB, Microsoft Word, Excel and Powerpoint
- Languages – Fluent in Spanish

Honors and Awards

- ATK Thiokol Propulsion Space 1st Place Award
- Honor's and Dean's List (Six Semesters)
- National Scholars Honor Society
- The National Dean's List

Hobbies and Interests

Skiing, golfing, weightlifting, jogging, cooking, wine-tasting, rainy nights, reading, traveling, playing the piano, camping, napping.

Personal Statement

Since childhood, airplanes and spacecraft have interested me profoundly, which is why I have not outgrown my childhood dream of working for NASA as an engineer. However, after graduating from high school, I felt an obligation to serve my country, so I enlisted in the United States Marine Corps with the intention of working in the aviation field. For the first 10 years, I worked in the aviation logistics and operations field, and for the last 10 years, I worked as an F/A-18 engine mechanic. Because of my leadership abilities, I deployed around the world six times, to include two combat tours.

During my first combat assignment, I was placed in charge of 28 Marines whose sole purpose was to maintain maximum aircraft readiness. Being the commander of my small detachment, it was my responsibility to ensure this readiness was accomplished through the procurement, processing, and distribution of all necessary aeronautical equipment to the aviation activities. As a junior Marine with only three years of experience and holding a position commensurate to a senior Marine with four times my experience, my leadership skills were honed and put to the test early on in my professional career. That assignment ended with the successful liberation of the Kuwaiti people.

During my second combat mission and with more leadership experience, I was directly responsible for the management of 60 engine assets as well as the welfare and concern of 110 Marines. My responsibilities included the inspection, maintenance, and repairs of aircraft power plants, enabling aviation activities to perform maximum combat flight operations. Additionally, I ensured the Marines under my charge maintained a high level of morale by granting them

sufficient amounts of rest, hot meals, and personal phone calls to their loved ones. That combat assignment proved to be the most challenging of all of my assignments, for it required an extraordinary amount of leadership skill, resolve, and discipline to protect our most important assets—the individual Marines. As a result of my selfless dedication to duty, we successfully completed our mission and returned home safely.

Upon retiring from the U.S. Marines, I had already completed an Associate of Science degree in Physics as well as a Bachelor of Science degree in Mathematics. Academically, I had achieved the goals I had set for myself and was prepared for my next step—attend Purdue University to earn my degree in Aerospace Engineering. Having been a leader of Marines and a college student at Purdue University has been a remarkable experience from which I have benefited immensely because I believe that I can best mentor others when I use my own experiences as the foundation for instruction. The indispensable leadership traits that I learned as a Marine have undoubtedly shaped me into the person I am today.

My determination fuels extraordinary dreams because I am passionate and enthusiastic about my education. It is my intention to finish my current course of study in aerospace engineering, then join the elite ranks of those engineers who work for NASA in order to gain a better understanding of the world in which we live and perhaps even make life better

Juan Gabriel Cruz-Ayoroa

University of Puerto Rico

Mayagüez, PR
Mechanical Engineering
Bachelor of Science, 2010

E-mail: juan.cruz.ayoroa@gmail.com



Academic and Research Experience

- ***UPRM Aero Design Team, University of Puerto Rico – 2005 to 2008***
Team Sub-captain, in charge of leading 45 member 2008 team
Manufacturing team leader for two years
Team pilot at 2007 and 2008 SAE Aero Design competitions
Helped team achieve 2nd and 3rd place at 2007 and 2008 competitions
Designed multiple successful aircraft and directed their construction
- ***Undergraduate Research, University of Puerto Rico – 2008 to present***
Analyzing turbine blade cooling utilizing Computational Fluid Dynamics
Distinguished for hard work, fast learning, rapid progress, and high motivation
- ***International Aerial Robotics Competition – 2009 to present***
Leader of the University of Puerto Rico 15 member team
Lead designer of fully autonomous UAV robot

Memberships and Activities

- Society of Automotive Engineers

Skills and Certifications

- Gambit and Fluent CFD
- AutoCAD, Pro-Engineer Wildfire, MathCAD
- MS Word, Excel, PowerPoint
- Programming – C, Matlab
- Languages – Fluent in Spanish

Hobbies and Interests

Model aviation, model rocketry, air and space simulations, astronomy, SCUBA diving, playing piano, 3-D modeling, learning science and philosophy, small scale engineering projects

Personal Statement

I would characterize myself as a person who is in love with life and whose driving forces are both a deep desire to learn about nature, and a powerful urge to use his abilities to contribute to humanity as much as he can. Engineering and aerospace topics have always been a big interest for me, which is why I decided to study Mechanical Engineering and follow with aerospace studies. My hobbies have also always involved these topics; I enjoy reading and learning about science, and have taught myself the basics of rocket propulsion. I find that NASA's mission is very compatible with my driving forces, and that air and space research has an enormous potential for helping us get to know better the world we live in, and in turn use this information to better our lives. The NASA Propulsion Academy has given me the opportunity to enter this amazing world, and I plan on taking full advantage of this opportunity to become a capable and productive engineer.

University of Florida

Gainesville, FL
Aerospace Engineering
Bachelor of Science, December 2010
E-mail: tymort@ufl.com



Academic and Research Experience

- ***Undergraduate Research, University of Florida – 2008 to present***
Interdisciplinary Microsystems Group
Assist graduate students on Fluid Dynamics university research projects
Develop ProE designs for a NASA Flow Impedence Wind Tunnel

Work Experience

- ***Kolter Communities, Intern, West Palm Beach, FL – Summer 2008***
Assisted Project Manager on a twenty story condo project
Reviewed plans and constructions revisions to ensure accuracy and completion
Meet with subcontractors throughout the summer on changes and updates to building
- ***The Breakers Hotel, Bagroom Attendent, Palm Beach, FL – 2006 to 2007***
Delivered and managed up to 700 golf bags for patrons
Organized and scheduled golfer's throughout the course for ease and less congestion

Memberships and Activities

- AIAA (treasurer)
- Benton Engineering Council
- NASA Space Florida Academy
- Circle K International (Lieutenant Governor)

Skills and Certifications

- Mechanical – manufacturing, circuitry, welding
- Computer – ProEngineer, MATLAB, LABview, FORTRAN, Microsoft Office

Hobbies and Interests

Guitar, Piano, Racquetball, Tennis, Golf, Water Skiing, Working on my car, and of course going to Gator games

Personal Statement

I have always been interested in science and technology, but I never knew exactly what I wanted to do. My friends told me I could be a rocket scientist, and after doing a little research, I decided that I wanted to work with rockets. My dream has always been to work at NASA, but it wasn't until recently that I decided that my involvement in the Aerospace Industry would be with propulsion. Something about Mach numbers, normal shocks, and back pressures got me really interested in the subject. After learning these topics I decided that I would do work in the Fluid Dynamics Research Lab at the University of Florida. After talking with graduate students and helping on their projects, I have gotten a better idea of what I'm interested in for my career after school. I then applied for the NASA Propulsion Academy in hopes that I would have a great internship experience with my anticipated future employer.

The next chapter in my experience as an undergraduate will be greatly influenced by this experience at the NASA Propulsion Academy. This will surely be one of the best summers I have ever had and I hope that it will give me some great hands on experience I need for a career in propulsion.

University of Alabama in Huntsville

Huntsville, AL
Aerospace Engineering
Bachelor of Science, 2011

E-mail: simmons7@yahoo.com



Academic and Research Experience

- ***Florida Space Academy, Cocoa Beach, FL – Summer 2006***
Toured Applied Physics lab, launch pads, and ISS processing center
Built a G-engine powered rocket and designed a housing for an onboard camera
Assisted with launching a weather balloon that reached 100,000 feet
- ***Microgravity University, Huntsville, AL – 2008***
Assisted in preparing proposal submitted to NASA
Volunteered and am on current flight manifest

Work Experience

- ***U.S. Space and Rocket Center, Space Camp Counselor Huntsville, AL – 2008***
Trained children and adults on simulations and mission control
Taught space history
Assisted with the Grand Opening of the Davidson Center of Space Exploration
Taught rocketry to all trainees
- ***Registered Nurse – 1997 to present***
Supervises certified nursing assistants and licensed practical nurses
Responsible for coordinating care of patients with physicians and family members
Administers medications and teaches patients self-care at home

Memberships and Activities

- ASME (vice-president)

Skills and Certifications

- PADI SCUBA instructor license
- 11 years of Supervisory Experience
- Strong communication and technical writing skills

Personal Statement

My major is Aerospace Engineering at UAH. I received my first degree in nursing from Indiana State University in 1997. I have worked all over the country as a travel nurse in various healthcare settings. I wanted to try something new so I decided to try engineering. While living in Florida, I witnessed my first shuttle launch, STS-111 and was inspired to work for NASA. I came to Huntsville, AL for an internship at the U.S. Space and Rocket Center and attended UAH. This year I was Vice President of American Society of Mechanical Engineers UAH chapter. I have experienced what it is like to work at Kennedy Space Center and am interested in making Marshall Space Flight Center my new workplace goal as my interests lie primarily in propulsion.

Liquid-Oxygen (LO2) / Liquid Methane (LCH4) 25-lbf Reaction Control Thruster Maturation

The objective of this task is to mature and test a LO2-LCH4 reaction control thruster prototype to characterize and improve its performance. The task includes the analysis and testing of the 25-lbf thruster at the MSFC Component Development Area (CDA) as well as the detailed assessment of test results and the development of a system sizing for a spacecraft reaction control system. The prototype thruster used in this task is based on previous design work, so that the analysis and testing tasks fit within time allotments for the Summer 2009 program. Team members for this task have a basic understanding of fluid dynamics through formal training in mechanical, aerospace, or chemical engineering or a related field. Skills in mathematics, heat transfer, and electronic instrumentation also prove to be valuable in this task.

Principal Investigator: *Kevin Pederson*

Team Lead: *Carlos Gomez*

Research Associates: *Matthew Cannella*
Jeffrey Hand
David Rosenberg

The University of Texas at El Paso

El Paso, TX
Mechanical Engineering
Masters of Science, December 2009
E-mail: cgomez7@miners.utep.edu



Academic and Research Experience

- ***Combustion and Propulsion Research Laboratory, El Paso, TX – 2008 to present***
Assist in design, development and testing of new technologies for spacecraft propulsion application
Develop test rigs for specific miniature propulsion systems
- ***Threat Systems Management Office, Fort Bliss / UTEP College of Engineering – 2005 to 2006***
Computer Aided Design, modeling of parts
Performed stress analysis of aircraft components through finite element models as well as convectional hand analysis
Ensured safe operation of aircraft modifications
Efficient generation of modification work orders crucial ofr the validation of the aircraft system installation

Work Experience

- ***Dynamic Modeling and Simulation, UTEP Mechanical Engineering Department, May 2007 to December 2007***
Modeled and tested dynamic systems in Unigraphics and ADAMS View
Explored and documented different features of Hypermesh, Unigraphics and ADAMS View

Memberships and Activities

- ICAD
- Sell Eco-marathon project – Lead Designer
- Pi Tau Sigma Mechanical Engineering Honor Society
- Tutor in mechanics and materials, gas dynamics, and fluid mechanics

Skills and Certifications

- Proficient in Unigraphics, ProE, Altair Hypermesh
- MATLAB, Simulink, Mathematica, ADAMS View
- Bilingual – Spanish and English

Personal Statement

I have always been a curious type of person. My curious nature has helped me make life changing decisions from elementary school to college. While attending elementary school I grew an interest in math and classical music. Math was encouraged by teachers giving awards for best demonstration of math knowledge. My musical interest leaned toward classical music in the course of watching family members play instruments. It was a very motivating time in my life. I then joined the orchestra and advanced math courses in middle school. When I was in High School I continued to take advanced math courses which led to the Science Club. I loved the friendly competition that I had with my peers and I also experienced how to work in a team environment. This turned out to be useful to know for college. When I graduated from high school I decided to seek a career as a math teacher, however, after watching my friends study for their engineering courses I decided to change my major. I was intrigued by how simple things in life can have more meaning behind it. With every class I took I became more aware of my interest for the engineering field. One course that truly affected my shift towards researching space propulsion systems was a course in combustion. After my bachelor's degree I decided to stay for Graduate School to further my knowledge in combustion. I am now part of a team in the Propulsion and Combustion Research Laboratory. I look forward to work in an environment where I could fully use my knowledge and skills to excel in my profession. Aside from school I enjoy spending time with my friends and meeting new people. I am very open minded and willing to try new things.

**University at Buffalo, the State University
of New York**

Buffalo, NY
Aerospace Engineering
Mechanical Engineering
Bachelor of Science, December 2009
E-mail: Msc9@buffalo.edu



Academic and Research Experience

- **Rocketry**
Helped design, build and test a 3 stage model high powered rocket with on-board electronics which recorded altitude, velocity and time parameters
Earned level 1 certification from the National Association of Rocketry (NAR)
- **Research**
Completed a study of the implementation of Traffic Collision Avoidance Systems (TCAS) into standard autopilot aircraft systems
Researched the feasibility of integrating a TCAS system with an autopilot system, and produced a computer simulation
- **Study Abroad**
Spent one semester in Toulouse, France studying at INSA, ENAC, and ISAE (SupAero)

Work Experience

- **Emergency Helicopter Floats, R&D Intern, Zodiac AirCruisers, Wall, NJ – Summer 2008 to Winter 2008**
Designed and tested upgrades for the Eurocopter EC120 emergency floatation system to utilize new company technology. Included formatting certification documents and interaction with FAA officials for product testing
Designed upgrades for Eurocopter BO-105 emergency floatation system to utilize composites, saving weight
Tested and modified a prototype dual actuation system to be used on the Bell 429 emergency float system
- **Space Shuttle Processing, APU/Hydraulics Intern, NASA Kennedy Space Center, FL – Summer 2007**
Programmed and implemented changes into PCGOAL2 display software. Helped to program launch commit criterion on the space shuttle's auxiliary power unit display and solid rocket booster hydraulic system display

Completed a feasibility study on the use of titanium tubing for the development of the hydraulic system in the upper stage of the upcoming Ares I rocket. This concluded with presentations to head designers of the Ares I

Memberships and Activities

- Sigma Gamma Tau Aerospace Engineering Honor Society
- Students for the Exploration and Development of Space (Director of Publications)
- Pi Tau Sigma Mechanical Engineering Honor Society
- UB Rocketry founder and president
- Schussmeister's Ski Club
- National Society of Collegiate Scholars
- University at Buffalo Scholars program member

Skills and Certifications

- National Association of Rocketry L1 certified
- ProEngineer Wildfire 3.0
- Autodesk Inventor (v.8-10)
- Autodesk AutoCAD (1999-current)
- SAMCEF Finite Element software
- Maple
- MathCAD
- MATLAB
- Adobe Dreamweaver
- LabVIEW 8.20
- C++
- NX I-DEAS
- HTML

Honors and Awards

- James R. McLernon Superior Student Award recipient
- Boy Scouts of America Eagle Scout

Personal Statement

I was born in Fairfield, Connecticut in 1987. I spent most of my childhood growing up in Missouri, and then in New Jersey, where my family currently resides. I've been extremely interested in space ever since I was young. If I had to pinpoint a couple things that really spiked my interest, two events that really stand out in my head is model rocketry, and the beginning of space shuttle missions to Space Station Mir. When I was 6, I received my first model rocket from my father, and it was an exhilarating experience building, constructing, and experiencing rocket flight first hand. It is a hobby I have continued up to this day, and continue to enjoy (currently have L1

cert). Around the same time, the NASA announced that the space shuttle would begin missions to space station Mir. I was fascinated by the idea of actually living long term in space, and thought that it would be an amazing experience to live and explore this final frontier of space. I excelled at math and science in school, but also enjoyed music and the outdoors. These passions have kept me well rounded, and I still like to occasionally play trumpet and hike whenever I can. Throughout my university career I have strived to balance my school work, and gain invaluable experience in the industry. This work and balance paid off, and during the summer of 2007 I had the opportunity to intern at Kennedy Space Center. Upon returning home from this internship, it became immediately obvious to me that there was a need for a rocketry club at my university. After gathering about ten interested students, I began the process of forming the club, and leading the students to begin constructing rockets. The club has increased in number tremendously, and rocketry is a hobby I continue to enjoy. I have been re-elected president of this club, and will continue to lead it onward and upward until I graduate in December of 2009. I look forward to the opportunity this summer with NASA Propulsion Academy, where I will gain experience with liquid fueled rockets.

Boston University

Boston, MA
Aerospace Engineering
Bachelor of Science, May 2010
E-mail: jhand@bu.edu



Academic and Research Experience

- ***Boston University Rocket Team***
Designing and fabricating nozzle and combustion components for experimental hybrid rocket engines. Testing will evaluate performance parameters such as thrust, specific impulse, and burn time.
- ***Research Engineer, NASA Glenn Research Center, Undergraduate Student Research Program – Spring 2008***
Developed a fluid analysis algorithm using MATLAB for boundary layer bleed modeling of supersonic and hypersonic inlets.

Work Experience

- ***Assistant Project Manager And Office Associate, Boston University Construction Services, Boston, MA – January 2007 to present***
Assist with the management of minor construction projects on campus by collaborating with faculty and contractors to plan and execute projects
Handle and edit project estimates, requisitions, and invoices, while maintaining a database of these items
Assist executive director of construction services with various tasks

Memberships and Activities

- Sigma Gamma Tau Aerospace Engineering Honor Society
- Students for the Exploration and Development of Space (SEDS)
- Tau Beta Pi Engineering Honor Society
- American Institute of Aeronautics and Astronautics (AIAA)
- Boston University Rocket Team: Hybrid nozzle and combustion design

Skills and Certifications

- MATLAB
- Simulink
- Solidworks
- ANSYS

- LinAir Simulator
- Javafoil
- Graphical Analysis
- Microsoft Office
- Linux/Unix

Honors and Awards

- David E Matson Engineering Book Award, June 2008
- Dean's list 2007, 2008

Hobbies and Interests

Mountain biking, hiking, skiing, weight lifting, reading, and music

Personal Statement

I was born and grew up in upstate New York. I became interested in science and engineering at an early age, and as I became older, I realized that I wanted to work in the aerospace industry. I currently attend Boston University and am working towards a bachelor's degree in aerospace engineering. In the spring of 2008, I had the opportunity of working at NASA Glenn Research Center as a USRP intern, where I helped develop computational tools to support experimental supersonic inlet analysis. This was a very rewarding experience and helped me gain insight into the workings of a world-class research facility. It was also this internship that inspired me to pursue a research oriented career, and it motivated me to apply for the NASA Academy. I have a particular interest in propulsion technology and I hope to contribute to this exciting field of research as early as possible in my career. I believe the NASA Propulsion Academy will help me to realize this goal, and I look forward to working at Marshall this summer with students who share the same interests as me. After graduating from BU, I plan on attending graduate school and working towards a Master's degree or Ph.D. in aerospace engineering. I have always had a passion for learning new things and I am excited to continue my education to a higher level. Aside from academics and career interests, my hobbies and interests include mountain biking, hiking, skiing, weight lifting, reading, and playing guitar.

Michigan University

Ann Arbor, MI
Aerospace Engineering
Master of Science, May 2011
Ph.D., May 2015

E-mail: DavidAriRosenberg@gmail.com



Academic and Research Experience

- ***The George Washington University***
Mechanical Engineering, Aerospace concentration
Minor in physics
Bachelor of Science, May 2009
Summa cum Laude
- ***Research Assistant, NASA Langley Research Center, Hypersonic Propulsion Branch – Summer 2008***
Aided in the research of optical measurement methods of supersonic combustion
Designed and build a moveable structure for the reception and transmission of lasers to measure combustion properties
- ***Research Fellow, Center for Biomimetics and Bioinspired Engineering (COBRE), Washington, DC – Summer 2007***
Performed wind tunnel tests on aircraft wings to determine the effect of high-lift devices
Wrote report and presented research findings to Engineering Department and in Research Gallery
Research has applications to MAVs

Work Experience

- ***Engineering Intern, HDR Inc., Alexandria, VA – December 2007 to January 2008***
Created drawings in AutoCAD and Microstation for use in various civil engineering projects
- ***Intellectual Property Intern, Wood & Eisenberg, PLLC, Alexandria, VA – Summer 2006***
Drew figures used in patent applications, in AutoCAD
Filed patent-related documents
Interacted with U.S. Patent and Trademark Office while filing patent applications

Memberships and Activities

- Tau Beta Pi
- Phi Eta Sigma

- Pi Tau Sigma – Vice President
- American Institute of Aeronautics and Astronautics (AIAA)
- American Society of Mechanical Engineers
- Theta Tau Professional Engineering Fraternity (Treasurer)

Skills and Certifications

- AutoCAD
- Microstation
- ProEngineer
- SolidWorks
- Fortran 95
- LaTeX
- LabView
- MATLAB
- Machine Shop
- MS Word, PowerPoint, Excel

Honors and Awards

- George Gamow Research Fellow
- COBRE Research Fellow
- Dean's List – Fall 2005, Fall and Spring 2006, Fall and Spring 2007, Fall and Spring 2008, Spring 2009

Hobbies and Interests

Spacecraft, designing and building things, music, sketch comedy, improv comedy, photography

Personal Statement

When I was three years old my brother and I watched *Star Wars*. I don't remember much from watching the movie, but I do remember seeing Luke walk alongside his X-Wing and being fascinated by the idea of space travel as a routine activity. I'm a little older now, but that idea still fascinates me. I want to take part in an effort to make space travel as regular as a ride in the car. I don't expect this to happen for several hundred years, but with the impending rise in private space transportation I feel that this is a great time to get in on the ground floor. Throughout my college career I was very involved in engineering-related activities. I was a brother of the professional engineering fraternity, Theta Tau, and served as treasurer for a year. I was vice president of Pi Tau Sigma, and a member of Tau Beta Pi. I was also involved in ASME and AIAA. I was a writer and performer in The George Washington University's improv and sketch comedy troupe *receSs*, a writer for *The Cellar*, GW's music magazine, and I am the singer for *The Anarchist Teddybears*, a Washington, DC local punk band founded by myself and a few friends from high school.

I recently graduated with honors from The George Washington University with a Bachelor of Science in Mechanical Engineering and a minor in physics. I will be continuing my education in the fall at the University of Michigan working toward a Masters and then a Ph., D. in Aerospace Engineering. My research there will focus on propulsion in either the field of hypersonics or rockets, but my initial research will focus on hypersonic propulsion.

After receiving my degrees I hope to work for NASA, the U.S. Department of Defense, or a government contractor in their manned spaceflight division. I would like to then continue research in propulsion and hopefully see manned spaceflight, or at least supersonic transportation, become commonplace. Or be an astronaut (of course).

Thrust Vector Control (TVC) Desk Top Learning Center

The students are to design and build a 2 axis inverted pendulum. The student will instrument the device and develop a controller to keep the pendulum vertical. The pendulum should demonstrate the concept of controlling a spacecraft's attitude via thrust vector control.

A tentative list of parts follows:

- Spherical Bearings (5 or 6)
 - Large bearings (1 or 2)
 - Small rod-end bearings (8) – 2 for each Electric Actuator + 2 for each LVDT
- Electric Actuator (2+1 spare)
- Linear Variable Differential Transformer (2+1 spare)
- Accelerometer/Rate Gyro Assembly (Maybe 1+a spare of each)
 - Could use iPhone or Wii controller
- Data Acquisition System (1)
 - Possibly use equipment from the 4656
- Baseball Bat/Vehicle Simulator (1)
 - Designed to allow variable length and diameter
 - Similar in shape to Ares I Outer Mold Line
 - Machined from Aluminum stock

The team will have access to hardware and equipment in Building 4656. They will also have the assistance of the technicians and engineers from ER35. A few of the longer lead time items like the electric actuators and sensors may be procured in advance. The team may require assistance from the Design, Dynamics, Stress, and Test groups in order to complete this project during the time allotted.

Principal Investigator: *Mike Ise*

Team Lead: *Katherine Gatian*

Research Associates: *Brenton Hartung*
 Steven Judson
 Chase Leibenguth

West Virginia University
Morgantown, WV
Aerospace Engineering
Mechanical Engineering
Bachelor of Science, May 2010

E-mail: Katie.gatian@gmail.com



Academic and Research Experience

- ***Department of Energy Mickey Leland Energy Fellowship, National Energy Technology Laboratory, Morgantown, WV – Summer 2008***
Reviewed journal articles and other literature relating circulating fluidized beds and fluidization
Conducted research on a circulating fluidized bed using piezoelectric sensors

Work Experience

- ***Department of Energy Professional Intern, National Energy Technology Intern, Morgantown, WV – September 2008 to present***
Assist researchers with obtaining and analyzing data from a circulating fluidized bed
Continue research with piezoelectric sensors

Memberships and Activities

- West Virginia University Honors College
- Sigma Gamma Tau Aerospace Engineering Honor Society
- Tau Beta Pi Engineering Honor Society
- Chi Omega Sorority – President (November 2008 to present), Recruitment Chair (November 2007 to November 2008), Make a Wish Chair (November 2006 to November 2007)
- Dance Marathon – Morale Chair (November 2009 to present)
- WVU Microgravity Research Team

Honors and Awards

- PROMISE Scholar
- WVU Presidential Scholarship
- Kaiser Aluminum Scholarship
- John Loth Aerospace Engineering Scholarship

Personal Statement

I was born on July 16th, 1988, in Morgantown, West Virginia and have been a resident of Morgantown for my entire life. In 2006 I graduated from Morgantown High School and chose to attend West Virginia University. I am currently a senior at West Virginia University double majoring in Mechanical Engineering and Aerospace Engineering.

As a freshman I went into the engineering program not knowing what to choose, but I quickly realized that this was the right field for me. As I learn more about the aerospace industry, I become more fascinated with it. Every aspect of it has something new and exciting to offer, whether you are become a NASA engineer or a pilot of a Boeing 747. I hope to one day be doing work to enhance the future of space travel.

While class has taken up most of my time in college, I have still found time to be an active member Chi Omega sorority, Tau Beta Pi honorary, and Sigma Gamma Tau honorary. Being involved in these organizations has shown me every part of what West Virginia University can offer to its students.

**University of Minnesota – Twin Cities
Institute of Technology**

Minneapolis, MN
Aerospace Engineering and Mechanics
Bachelor of Science, December 2010

E-mail: hartu033@umn.edu



Academic and Research Experience

• ***Undergraduate Research Opportunities Program (UROP) – Fall 2008***

Goal: Design and build a fluid dynamics experiment to simulate collisions of gas bubbles and rocks within volcanic magma

Procedure: Wire a circuit to control two separate valves, one for releasing the rock and the other for releasing the bubble

Data Collection: Film the collision with high-speed cameras and process the data using Particle Image Velocimetry (PIV) software

Work Experience

• ***Undergraduate Student Research Program Intern (USRP), NASA Johnson Space Center, Houston, TX – Spring 2009***

Worked with the Descent Analysis Group researching the ballistic abort trajectory of the Orion Crew Exploration Vehicle during reentry

Studied limits of guidance, navigation, control, operations, and tracking during entry, descent, and landing

Considered many important factors such as thermal loads, human physiology, and structural loads

• ***Goodrich Intern, Burnsville, MN – Summer 2008***

Worked closely with a small team, calibrating mechanical and electrical equipment in the metrology lab

Individually improved consistency and flow within the Goodrich tooling database while working in Configuration Management

Memberships and Activities

- American Institute of Aeronautics and Astronautics (AIAA)
- University Nanosatellite Program (Nanosat-5)

Skills and Certifications

- Operating Systems: Windows, Macintosh, Linux
- Computer Programming: C, C++
- Software: FreeFlyer, MATLAB, Mathematica, Adobe Acrobat
- Microsoft Software: Word, Excel, PowerPoint, Outlook, Access

Honors and Awards

- Certificate of Excellence-Mission Operations Directorate, NASA Johnson Space Center
- Chester Gaskell Aeronautical Engineering Scholarship

Hobbies and Interests

Space exploration, sports, guitar, spending time with family and friends, and running

Personal Statement

I was born and raised in a small town in western Wisconsin, and I am currently a junior at the University of Minnesota-Twin Cities. I plan to receive my Bachelors Degree in Aerospace Engineering and Mechanics in May 2011.

Since I was very young, I have been interested in space exploration and have strived to work for NASA. This past spring, I was able to spend the semester in Houston, Texas interning for NASA-Johnson Space Center. I worked in the Flight Design and Dynamics Branch where I put my knowledge of aerospace engineering to the test. It was an amazing experience, and it confirmed my passion for NASA and the aerospace industry.

I look forward to an equally rewarding summer at NASA-Marshall Space Flight Center as a member of the NASA Propulsion Academy. I know it will allow me to broaden my knowledge of propulsion while giving me the opportunity to work closely with top scientists and engineers, as well as with other students who are as interested in the space program as I am.

University of Mississippi
University, MS
Mechanical Engineering
Bachelor of Science, May 2011

E-mail: jsjudson@olemiss.edu



Work Experience

- ***Plant Operations Tech I, Baptist Memorial Hospital – Golden Triangle, Columbus, MS – Summer 2007***
Performed duties such as watering annual flowers, trimming tree limbs, and keeping the grass cut
Serviced company vehicles monthly
- ***Orientation Leader, Office of Orientation and Student Programming, University, MS – June 2008***
Helped facilitate the various programs that make up orientation each year
Work with incoming students and their families to help make the transition to college as smooth as possible
- ***Engineering Ambassador, University, MS – August 2008 to present***
Help recruit incoming students to major in engineering
Set up for career fairs and visit area schools to recruit

Memberships and Activities

- Ole Miss First
- Increasing Minority Access to Graduate Education (IMAGE)
- National Society of Black Engineer (NSBE)
- National Organization for the Advancement of Black Chemists and Chemical Engineers
- Brown Hall Resident Assistant (Hall Operations Chair)
- ASB Student Involvement Committee
- Alpha Phi Alpha Fraternity, Inc.
- Freshman Focus
- Brown Hall Council (Programming Chair)
- Residential Scholars Program
- Respect Mississippi
- NAACP
- Black Student Union (BSU)
- MALC (vice-president)

Skills and Certifications

- Microsoft Word, PowerPoint, Excel
- Java
- FORTRAN
- AutoCAD
- Mathematica

Honors and Awards

- Dean's Honor Roll (2007)

Hobbies and Interests

Basketball, motors, robotics

Personal Statement

As a child, I always had a keen interest to learn how things worked. Every time my new toys grew old to me, I found myself tearing the apart just to see how they were put together. Learning about how my toys worked was more fun to me than actually playing with them. Therefore, when it became time to start deciding on a major, engineering was the obvious choice. It was not until I took an introduction to engineering course while I was in the Summer College program at Ole Miss that I was able to come to a decision that mechanical engineering was what I wanted to do. Also, since I grew up in Columbus, Mississippi, I became interested in watching planes and learning about how they work because I always see planes and jets fly over my house from the near by Columbus Air Fore Base, where they train almost half of all the pilots in the world. Along with being a top training base, the Columbus Air Force Base had one of the only landing strips long enough to land a 747 plane with a NASA Space Shuttle attached in case of bad weather in California or if the crew on board needed to make a short stop on their way back to Florida. During my childhood, I remember the few times that one of the shuttles had to land in Columbus and I remember how excited I was to know that it would be landing in my city. So when I heard about my acceptance into NASA Academy at Marshall this summer, I was extremely excited to have the opportunity to play a huge part in future space exploration and research.

The University of Alabama

Tuscaloosa, AL
Aerospace Engineering
Bachelor of Science, May 2011

E-mail: cmleibenguth@crimson.ua.edu



Academic and Research Experience

- ***Undergraduate Research Assistant, Department of Aerospace Engineering and Mechanics, The University of Alabama – August 2008 to present***

Work Experience

- ***Louisiana School for Math, Science, and the Arts – August 2006 to May 2006***
Math department tutor
Physics department tutor

Memberships and Activities

- The University of Alabama Honors Program
- The University of Alabama International Honors Program
- The University of Alabama Scholar's Program
- National Society of Collegiate Scholars
- Tau Beta Pi
- Phi Eta Sigma
- Phi Kappa Phi
- American Institute of Aeronautics and Astronautics (Public Relations/Engineering Electric Council Officer, Fall 2009-Spring 2010)
- American Society of Mechanical Engineers

Skills and Certifications

- Proficiency in C++
- MATLAB
- Microsoft Office

Honors and Awards

- 2nd place – Open Topic Presentation, AIAA Southeastern Regional Student Conference
- Dean's and President's List (4 semesters)

Hobbies and Interests

reading, weight lifting, playing and listening to music, traveling, gaming

Personal Statement

I was born and raised in Baton Rouge, Louisiana with my older brother. At an early age, I was introduced to various science fiction movies and TV shows that inspired my desire to explore the solar system. Around the same time, all of my teachers discovered that I had a knack for mathematics and logic. Though I was never officially tested for the gifted program, I eventually attended a magnet school where I received the last bit of inspiration and knowledge necessary to convince me that I should make my childhood dreams into reality.

Since graduating high school I have attended The University of Alabama as a full time student majoring in aerospace engineering and mechanics and minoring in applied mathematics. My goal has been to balance my school work with valuable research and work experience, small social life, and traveling the world. Even after I graduate, I do not think I will ever stop being a full time student in spirit with my desire to learn so much about the world and solar system that we inhabit.

Staff

NASA Propulsion Academy Program Director

Dr. Rudy Gostowski

Rudy Gostowski's life ambition has been to merge his interest and aptitude in science with helping others appreciate and develop the skills of organized inquiry.

Returning from a two-year fellowship at Fisk University, a historically Black school in Nashville, Tennessee, Dr. Gostowski continues a seven-year career as a chemist at NASA working with rocket propellants and examining their compatibility with materials used to construct propulsion systems. His experience has included technical support of the Space Shuttle solid propellant boosters and work towards less toxic yet high-performing chemical propellants.

The fellowship at Fisk was a great opportunity to create new and sustainable educational programs at the school. Case in point, the Inquiry-Based General Chemistry Laboratory Course, developed during the fellowship, continues to motivate and instruct participants. Likewise, the student rocket team, whether building a sounding rocket for the University Student Launch Initiative competition or providing hands-on activities for area middle school students, continues as a focus for those interested in aerospace, science or education.

Prior to his time at Marshall Space Flight Center, Dr. Gostowski was a tenured Associate Professor of Chemistry at Austin Peay State University located in Clarksville, Tennessee. At the school, he taught introductory and advanced courses in Analytical Chemistry and conducted research with the collaborative-assistance of students in the area of organic free radicals. With his firm belief in the importance of research experience for students, Dr. Gostowski conceived and developed the Presidential Research Scholar Program and the Undergraduate Student Research Symposium.

He received a Doctorate of Chemistry degree from Southern Illinois University in Carbondale, Illinois after completing a Bachelor of Science program in Biological Sciences and also holds an Illinois Teaching License for grades sixth thru twelfth in Science. Dr. Gostowski is an author of fourteen publications and given over twenty-eight presentations discussing matters of chemistry, rocket propulsion and education. He is an active member of various professional societies, notably the American Chemical Society, Sigma Xi and the Council on Undergraduate Research.

He holds this as his philosophy for education and for life, "Anything that we have to learn to do we learn by the actual doing of it... We become just by doing just acts, temperate by doing temperate ones, brave by doing brave ones" (Aristotle Nicomachean Ethics, Book II, p.91).

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

Adrienne Accardi

Adrienne Accardi is an alumnus of the 2008 MSFC NASA Academy. Adrienne is currently completing the five-year bachelor-masters program at the University of South Florida in mechanical engineering. Her research area is corrosion, specifically the corrosion of coated reinforcing steel in marine bridges. She enjoys learning about material durability and metallurgy. She intends to work towards a Ph.D. in either mechanical engineering or materials engineering. Adrienne's goal is to become a NASA engineer working on the new generation of space vehicles and an astronaut. In her free time, she enjoys cooking, baking, reading biographies and Russian literature, and painting.

Links

- ***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/>
- ***For Inspiration and Recognition in Science and Technology:***
<http://www.usfirst.org/>
- ***International Space University:***
<http://www.isunet.edu>
- ***The Soffen Memorial Fund:***
<http://www.nasa-academy.org/soffen/donors.html>