HEATHER ANN ORAVEC

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BIOGRAPHY

Dr. Heather Oravec is a researcher in the diverse fields of aerospace and geotechnical engineering, with an emphasis in the respective areas of advanced aerospace seals and lunar soil mechanics. A native of Cleveland, Ohio, Dr. Oravec studied at Case Western Reserve University earing her doctorate in 2009. Dr. Oravec has over seven years of professional experience and currently holds a position with the University of Akron as a Research Associate Professor. Under the multi-million dollar Advanced Research & Technology Support contract, Dr. Oravec works as a federal contractor to NASA Glenn Research Center in Cleveland, Ohio. Dr. Oravec's current research focuses on the development and characterization of low-leakage seal technologies for the NASA Docking System as well as high temperature thermal barriers and seals for the thermal protection system of NASA's Orion Multi-Purpose Crew Vehicle and other Aeronautics missions. Her work covers a broad range of development activities including conceptual design, experimental testing, and analysis of seals that must withstand the harshness of space and interplanetary missions. Dr. Oravec was influential in developing an analytical technique to repeatably and reliably determine the compression force of elastomeric space seals, which is subjective by nature. This method is imperative for accurate comparisons between seals of different elastomer materials and designs and can be implemented with a high level of accuracy between researchers. Dr. Oravec has also worked extensively on the mechanical characterization of the lunar regolith focusing on the mobility of exploration vehicles. As a past member of NASA's Surface Mobility Technology Team she developed a lunar regolith simulant specific for the evaluation of vehicle traction in soft terrain. This simulant, designed for NASA Glenn Research Center, is currently being utilized by laboratories at Case Western Reserve University, Johnson Space Center, Jet Propulsion Laboratory, Goodyear Tire & Rubber Company, Honeybee Robotics, Clemson University, Virginia Polytechnic Institute and State University, and Milliken & Company. Other research interests include understanding the effects of gravity and vacuum on the mechanical properties of extraterrestrial regolith to support vehicle design and in situ resource utilization. Additionally, she is interested in the abatement of orbital debris and dust on mechanical, electronic, and human support system components. Dr. Oravec has circulated much of her research endeavors with five journal publications in print or in review, and over 20 conference papers and presentations. In addition to her scientific contributions, Dr. Oravec has supported the University mission by involving students in collaborative research projects with NASA. Dr. Oravec was a co-advisor to The University of Akron's student team that submitted a winning proposal to the Nine Sigma NASA Challenge I: Textile Testing Methods in 2016.

EDUCATION

CASE WESTERN RESERVE UNIVERSITY	Cleveland, Ohio, 2005-2009 Doctor of Philosophy, Civil Engineering Dissertation Title: *Understanding Mechanical Behavior of Lunar Soils for the Study of Vehicle Mobility*
CASE WESTERN RESERVE UNIVERSITY	Cleveland, Ohio, 2004-2006 Master of Science, Civil Engineering Thesis Title: *Cone Penetrometer Equipped with Piezoelectric Sensors for the Measurement of Soil Stiffness in Highway Pavement*

CLEVELAND STATE UNIVERSITY	Cleveland, Ohio, 2000-2004 Bachelor of Science, Civil Engineering Graduated *Magna cum Laude* Division I Softball, Varsity Athlete

PROFESSIONAL EXPERIENCE

RESEARCH ASSOCIATE PROFESSOR, Department of Mechanical Engineering, The University of Akron
Advanced Research & Technology Support, Mechanisms and Tribology Branch, NASA Glenn Research Center
(October 2017 – Present)

- Contractor at NASA Glenn Research Center in Cleveland, OH working under a multi-million dollar federal contract award, responsible for research and development of spaceflight hardware.
- Develop and execute test plans for static and dynamic thermal barrier seals on Lockheed Martin's Tactical Boost Glide vehicle.
- Execute continued research and development of state-of-the-art materials and preload devices for high temperature thermal barriers in support of NASA's Hypersonics Technology Project.
- Developed a semi-automated analytical tool to evaluate the coefficient of friction between tribopairs of candidate thermal barrier sheath materials and thermal protection system components.
- Developed an analytical method and tool to evaluate the resiliency of candidate thermal barrier preload devices.

RESEARCH ASSISTANT PROFESSOR, Department of Mechanical Engineering, The University of Akron
Advanced Research & Technology Support, Mechanisms and Tribology Branch, NASA Glenn Research Center
(October 2013 – Present)
Advanced Aerospace Seals Research, Mechanisms and Tribology Branch, NASA Glenn Research Center (November 2010 – September 2013)

- Contractor at NASA Glenn Research Center in Cleveland, OH working under a multi-million dollar federal contract award, responsible for research and development of spaceflight hardware.
- Developed an analytical method and tool for characterization of the compression loads of elastomeric space seals.
- Execute continued research and testing on the main interface docking seal of the International Space Station (ISS) and NASA's Crew Exploration Vehicle (CEV) as well as the main docking hatch seals of the Orion Multi-Purpose Crew Vehicle (MPCV).
- Execute continued research and testing on high temperature thermal barriers.
- Construct, modify, conduct, analyze, and document laboratory experiments for seal performance characterization using electromechanical and hydraulic load frames, thermal control chambers, helium leak detector, pressure decay and mass point leak test apparatus, flow test apparatus, scrub test apparatus, non-contact laser measurement systems, and tribometer wear test apparatus.
- Disseminate scientific information in the format of technical publications and presentations.

POSTDOCTORAL FELLOW, Mechanisms and Tribology Branch, NASA Glenn Research Center
(April 2009 – October 2010)

- Awarded a fellowship under the proposed project, "Simulated Lunar Environment for the Study of Regolith Strength." (Mentor: Dr. Phillip Abel)
- Designed and developed of a vacuum bevameter lunar soil simulant strength testing apparatus to meet NASA's Human Robotic Systems goals for lunar exploration.
- Constructed, modified, and conducted experiments on lunar soil simulants JSC-1A and NU-LHT-2M.
- Disseminated experimental results in the format of technical publications and presentations.

- Managed operation of test equipment, documentation of safety permits and standard operating procedures in the Soils Design Laboratory at the NASA Glenn Research Center including table bevameter, triaxial test apparatus, cone penetrometer, and mechanical sieve shaker.
- Contributed to the research and development of the GRIP rig small-scale traction testing device used to compare the visual performance of various tread patterns on a wheel.

ENGINEERING INTERN, URS Corporation (May 2003 – December 2005)

- Responsibilities included reviewing of soil boring logs, performing slope stability analyses, bearing capacity analyses, landfill cap design, settlement analyses, and foundation design.
- Managed Telecom cell tower projects including all correspondence, scheduling, analysis, design, and final reports.
- Performed GPS utility surveys updating water and sewer GIS for the City of Ashland, OH.
- Performed field work including initial site investigations, monitoring of drilling, and monitoring of pile driving for quality control/quality assurance purposes.
- Gained experience with AutoCAD, ARCview, SLOPE/W, ProSheet, LPILE.

FIELD OBSERVER, Construction Resources, Inc. (May 2002 – October 2002; May 2001 – August 2001)

- Responsible for monitoring contractor's workmanship in the remediation of exterior roofing and masonry restoration projects.
- Ensured construction products and procedures complied with those specified in the construction documentation.
- Submitted daily field reports, outlining the project status for the building owner.
- Voted by company president as having the most comprehensive field reports out of all field observers.

RESEARCH EXPERIENCE

NASA GLENN RESEARCH CENTER, Grantee (June 2006 – March 2009)

- Conducted an investigation on the mechanical properties of the lunar soil and lunar soil simulants: MLS-1, JSC-1, and JSC-1A.
- Developed of a new lunar soil simulant, GRC-1, capable of being produced in large quantities for vehicle mobility tests which aid in the design of vehicles for surface exploration on the Moon.
- Conducted laboratory tests to determine the mechanical properties of GRC-1 and to determine how to emulate the compaction and shear behavior of the material for lunar vehicle mobility studies.
- Facilitated the development of a geotechnical engineering soils testing laboratory at the NASA Glenn Research Center.

OHIO SPACE GRANT CONSORTIUM (OSGC), Fellow (August 2005 – April 2008)

- Investigated the development of a regolith penetrometer equipped with piezoelectric sensors to measure penetration resistance and material stiffness of in situ lunar soil.
- Authored grant proposals, research papers, and attended disseminated information at the annual OSGC Symposium.

CASE WESTERN RESERVE UNIVERSITY, Eisenhower Graduate Transportation Fellow (August 2005 – December 2005)

- Developed a cone penetrometer equipped with piezoelectric sensors for the measurement of soil stiffness underneath highway pavement.
- Performed successful laboratory testing of the new test instrument.

CASE WESTERN RESERVE UNIVERSITY, Case Prime Fellow (August 2004 – May 2005)

- Conducted laboratory experiments on piezoelectric sensors for implementation into a penetrometer capable of measuring the soil stiffness underneath highway pavement.

PROFESSIONAL SERVICE

TECHNICAL CHAIR

2017 Fluid Measurement and Instrumentation IV, Session Co-Organizer, 2017 ASME Fluids Engineering Summer Division Meeting, Waikoloa, Hawaii, 31 July-3Aug.

2013 Liquid Rocket Propulsion/Solid Rocket Propulsion/System Concepts and Supporting Propulsion Technologies (ITAR restricted), Session Chair, 49th AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit, San Jose, California, 14-17 July.

2012 Symposium 1: Workshop of Granular materials in Lunar and Martian Exploration, Session Chair, ASCE Earth and Space Conference, Pasadena, California, 15-18 April.

TECHNICAL REVIEWS

2018 ASCE Earth and Space Conference
2017 ASCE Earth and Space Conference
2016 ASCE Journal of Aerospace Engineering
2014 Journal of Terramechanics
2014 Colorado School of Mines, Civil and Environmental Engineering Department (Outstanding Graduate Student Paper Judge)
2012 Colorado School of Mines, Civil and Environmental Engineering Department (Outstanding Graduate Student Paper Judge)
2012 Journal of Performance of Constructed Facilities
2012 Journal of Aerospace Engineering
2011 Journal of Aerospace Engineering
2011 Journal of Geophysical Research
2006 1st North American Landslide Conference

ACADEMIC SERVICE AND MENTORSHIPS

NASA GLENN RESEARCH CENTER	Mentor, Summer 2017 NASA LERCIP Intern, John Magradey (NC State University) Project: "Small-Scale Adhesion Test Rig Programing and Testing"
THE UNIVERSITY OF AKRON	Co-advisor, Fall-Spring 2016-2017 Jason Hamburger, Drew Sanders, Matthew Taylor (The University of Akron) Mechanical Engineering Senior Design Project: "Thermal Barrier Test Rig Design, Construction, and Testing"
NASA GLENN RESEARCH CENTER	Co-mentor, Summer 2016 NASA LERCIP Intern, John Magradey (Clemson University) Project: "Leak Rate Uncertainty Parametric Study"
THE UNIVERSITY OF AKRON	Co-mentor, Fall 2016 Himel Barua, Thomas Collins, Riniah Foor, Evan Hess, Joey Stavale (The University of Akron) NASA's Space Suit Textile Testing Challenge: "Cylindrical Abrasion Method" Submitted one of three winning proposals with option for follow-on work
CASE WESTERN RESERVE UNIVERSITY	Teaching Assistant, Spring 2008 ENGR 200: Statics and Introductory Strength of Materials Course Instructor: Dr. Xiangwu Zeng
CASE WESTERN RESERVE UNIVERSITY	Teaching Assistant, Fall 2005 ENGR 200: Statics and Introductory Strength of Materials Course Instructors: Dr. Xiangwu Zeng, Dr. Robert Mullen, Dr. Roberto Ballarini

CASE WESTERN RESERVE UNIVERSITY	Teaching Assistant, Spring 2005 ENGR 200: Statics and Introductory Strength of Materials Course Instructor: Dr. Xiangwu Zeng

ACADEMIC OUTREACH ACTIVITIES

2017 NASA HIGH SCHOOL SHADOW DAY, NASA Glenn Research Center (November 2017)

- Technical mentor for high school juniors participating in NASA's shadow day.
- Provided two-on-one dialogue with students interested in STEM careers.
- Facilitated tours of NASA GRC's Advanced Aerospace Seals Laboratories, Simulated Lunar Operations laboratory, and iLAB facility.

2017 GOODYEAR/THE UNIVERSITY OF AKRON STEM CAREER DAY, The University of Akron (April 2017)

- Speed mentor for high school students interested in STEM careers.
- Provided one-on-one dialogue with students interested in civil, mechanical, and aerospace engineering with the goal of informing and encouraging students to pursue opportunities, educationally and professionally, in these STEM fields.
- Answered general questions about what it's like to be an engineer and discussed specific lessons learned along my career path.

2017 SPECTRUM AKRON REGIONAL SCIENCE OLYMPIAD, The University of Akron (March 2017)

- Supervisor of the Division C high school level Write It Do It event—teams of two students from 24 local schools were required to compose a written description of a 3D model and build the model based only on the written description.
- Developed the 3D model and scoring rubric, monitored the students during the writing and construction portion, and judged the final builds to determine the rank of each team.
- Promoted the importance of strong technical writing skills in science and engineering related fields.

SENIOR JOB-SHADOW PROJECT, Nordonia High School (May 2016)

- Mentored a high school senior, providing real world job experience at NASA Glenn Research Center in the field of mechanical engineering.
- Engaged student through active participation in typical duties including design, modeling, and experimental testing.
- Facilitated tours of NASA GRC's iLAB and Exercise Countermeasures Laboratory.

JOB-SHADOW, Creighton Prep (March 2014)

- Initiated a job shadow experience for a high school junior at NASA Glenn Research Center in the fields of mechanical and aerospace engineering.
- Facilitated tours of GRC's most prominent test facilities.

PUBLICATIONS

JOURNAL ARTICLES

5. Daniels, C.C., Braun, M.J., **Oravec, H.A.**, Mather, J.L., & Taylor, S.C., (2017, August). Leak-Rate-Quantification Method for Gas Pressure Seals with Controlled Pressure Differential. *Journal of Spacecraft and Rockets*. *54*(6), pp. 1228-1234.
4. Daniels, C.C, **Oravec, H.A.**, Mather, J.L., & Taylor, S.C., (paper submitted 2016). Degradation of Silicone Elastomer Seals from Ultraviolet Radiation. *Journal of Spacecraft and Rockets*.

3. **Oravec, H.A.**, Zeng, X., & Asnani, V. M. (2010, December). Design and Characterization of GRC-1: A Soil for Lunar Terramechanics Testing in Earth Ambient Conditions. *Journal of Terramechanics, 47*(6), 361-377.
2. Zeng, X., He, C., **Oravec, H.A.**, Wilkinson, A., Agui, J., & Asnani, V. M. (2010, April). Geotechnical Properties of JSC-1A Lunar Soil Simulant. *ASCE Journal of Aerospace Engineering, 23*(2), 111-116.
1. **Hlasko, H.A.**, & Zeng, X. (2010, February). Piezoelectric Probe for Measurement of Soil Stiffness. *International Journal of Pavement Engineering, 11*(1), 25-35.

CONFERENCE PAPERS, PRESENTATIONS, AND PROCEEDINGS

19. Dunlap, Jr., P.H., DeMange, J.J., Taylor, S.C., **Oravec, H.A.**, & Gabb, T.P. (2017). High Temperature Seal Technologies for Future Hypersonic Vehicles. *Proceedings of the Joint Army-Navy-NASA-Air Force Meeting*. Newport News, VA: JANAF.
18. Magradey, Jr., J.W, Daniels, C.C., & **Oravec, H.A.** (2017). Leak Rate Uncertainty Parametric Study. *Proceedings of the ASME 2017 Fluids Summer Meeting*. Waikoloa, HI: ASME.
17. **Oravec, H.A.,** Daniels, C.C., & Mather, J.L. (2017). Validation of Test Methods for Air Leak Rate Verification of Spaceflight Hardware. *Proceedings of the ASME 2017 Fluids Summer Meeting*. Waikoloa, HI: ASME.
16. Daniels, C.C., Mather, J.L., **Oravec, H.A.**, & Dunlap, P.H. (2016). Evaluation of a Conductive Elastomer Seal for Spacecraft. *Proceedings of the 52nd AIAA/SAE/ASEE Joint Propulsion Conference.* Salt Lake City, UT: AIAA.
15. Daniels, C.C., Braun, M.J., **Oravec, H.A.**, Mather, J.L., & Taylor, S.C. (2015). Leak Rate Quantification Method for Gas Pressure Seals with Controlled Pressure Differential. *Proceedings of the 51st AIAA/SAE/ASEE Joint Propulsion Conference.* Orlando, FL: AIAA.
14. **Oravec, H.A.**, Daniels, C.C., & Penney, N. (2015). Destructive Removal of Candidate Subscale Two-Piece Silicone Elastomer Docking Seals. *Proceedings of the 51st AIAA/SAE/ASEE Joint Propulsion Conference.* Orlando, FL: AIAA.
13. Taylor, S.C., Mather, J.L., Penney, N., **Oravec, H.A.**, & Daniels, C.C. (2015). Performance Evaluation of a Candidate Full-scale Dynamic Interface Seal for the International Low Impact Docking System. *Proceedings of the 51st AIAA/SAE/ASEE Joint Propulsion Conference.* Orlando, FL: AIAA.
12. Daniels, C.C., Mather, J.L., **Oravec, H.A.**, Taylor, S.C., & Dunlap, Jr., P.H. (2015). Elastomer Seal Performance after Terrestrial Ultraviolet Radiation Exposure. *Proceedings of the 7th AIAA Atmospheric and Space Environments Conference*. Dallas, TX: AIAA.
11. **Oravec, H.A.** & Daniels, C.C. (2014). Leak Rate Performance of Silicone Elastomer O-Rings Contaminated with JSC-1A Lunar Regolith Simulant. *ASCE Earth and Space 2014: Engineering for Extreme Environments*. St. Louis, MO: ASCE.
10. **Oravec, H.A.** & Daniels, C.C. (2014). Implementation of Statistical Process Control: Evaluating the Mechanical Performance of a Candidate Silicone Elastomer Docking Seal. *Proceedings of the 50th AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit.* Cleveland, OH: AIAA.
9. **Oravec, H.A.**, Garafolo, N.G., and Daniels, C.C. (2013). The Mechanical and Sealing Performance of an Atomic Oxygen Pretreated Subscale Candidate Silicone Elastomer Docking Seal. *Proceedings of the 49th AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit*. San Jose, CA: AIAA.
8. Gallo, C. A., Agui, J. H., Creager, C. M., & **Oravec, H. A.** (2012). A Comparison Between the NORCAT Rover Test Results and the ISRU Excavation System Model Prediction Results. *Proceedings of the 50th AIAA Aerospace Sciences Meeting.* Nashville, TN: AIAA.
7. **Oravec, H. A.**, Wasowski, J. L., & Daniels, C. C. (2012). The Effect of Temperature and Dwell on the Adhesion Force of Silicone Elastomer Seals. *Proceedings of the 50th AIAA Aerospace Sciences Meeting.* Nashville, TN: AIAA.
6. Dunlap, Jr., P. H., Martin, R. E., Garafolo, N. G., **Oravec, H. A.**, & Steinetz, B. M. (2011). Durability Testing of Docking System Seals for Space Applications. *Proceedings of the 47th AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit.* San Diego, CA: AIAA.
5. Moreland, S., Skonieczny, K., Wettergreen, D., Asnani, V. M., Creager, C. M., & **Oravec, H. A.** (2011). Inching Locomotion for Planetary Rover Mobility. *Aerospace Conference, 2011 IEEE* (pp. 1-6). Big Sky, Montana: IEEE.

4. **Oravec, H. A.**, Panickar, M. B., Wasowski, J. L., & Daniels, C. C. (2011). Influence of Elastomer Compound and Test Temperature on the Compression Force of Candidate Space Seals: A preliminary study. *Proceedings of the 47th AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit.* San Diego, CA: AIAA.
3. **Oravec, H. A.**, Abel, P. B., & Asnani, V. M. (2010). Simulation of the Lunar Environment for the Study of Regolith Strength. In G. Song (Ed.), *Earth and Space 2010: Engineering Construction, and Operations in Challenging Environments.* Honolulu, Hawaii: ASCE.
2. Zacny, K., Wilson, J., Craft, J., Asnani, V. M., **Oravec, H. A.**, Creager, C. M., et al. (2010). Robotic Lunar Geotechnical Tool. In G. Song (Ed.), *Earth and Space 2010: Engineering, Construction, and Operations in Challenging Environments.* Honolulu, Hawaii: ASCE.
1. **Oravec, H. A.**, Asnani, V. M., & Zeng, X. (2008). The Development of A Soil For Lunar Surface Mobility Testing in Ambient Conditions. In W. K. Binienda (Ed.), *Earth & Space 2008: Engineering, Science, Construction, and Operations in Challenging Environments: Proceedings of the Eleventh Biennial ASCE Aerospace Division International Conference on Engineering, Science, Construction, and Operations in Challenging.* Reston: ASCE.

PUBLISHED ABSTRACTS AND PRESENTATIONS

5. Taylor, S.C., DeMange, J.J., Mayer, J.J., & **Oravec, H.A.**, (2018). Tribological Evaluation of Thermal Protection System Materials for High-Speed Aerospace Vehicles. *42nd Annual Conference on Composites, Materials, and Structures*. Cape Canaveral, FL: USACA.
4. **Oravec, H.A.** and Daniels, C.C. (2013). Adhesion Forces of Silicone Elastomer Seals Pretreated with Atomic Oxygen. *Proceedings of the 2013 National Space & Missile Materials Symposium*. Bellevue, WA.
3. **Oravec, H. A.**, & Abel, P. B. (2012). Simulated Lunar Environment for the Study of Regolith Strength: An Improved Vacuum Bevameter Design. *Dayton-Cincinnati Aerospace Sciences Symposium.* Miamisburg, OH: AIAA.
2. **Oravec, H. A.**, & Abel, P. B. (2012). Simulated Lunar Environment for The Study of Regolith Strength: An improved vacuum bevameter design. *Proceedings of the 2012 ASCE Earth and Space Conference.* Pasadena, CA: ASCE.
1. Wilkinson, A., DeGennaro, A., **Oravec, H. A.**, Agui, J., & Johnson, J. (2011). Cone Penetrometry as a Validation Experiment for Geotechnical Discrete Element Modeling. *4th Annual NASA Lunar Science Forum.* Moffett Field, CA: NASA.

INVITED PRESENTATIONS

1. **Oravec, H. A.**, Creager, C. M., & Asnani, V. M. (2010). Study on Benefits of Vehicle Articulation with Regards to Soil Response & Simulated Lunar Environment for the Study of Regolith Strength. *NASA Lunar Science Institute: Scientific and Exploration Potential of the Lunar Poles Team Meeting.* Applied Physics Laboratory, Laurel, Maryland.

POSTERS

3. **Oravec, H. A.**, & Zeng, X. (2008, February). Understanding the Mechanical Behavior of Lunar Soil for the Study of Vehicle Mobility. *NASA Future Forum*. Columbus, Ohio, USA.
2. **Hlasko, H. A.**, & Zeng, X. (2006, April). Cone Penetrometer Equippend with Piezoelectric Sensors for Measurment of Soil Stiffness in Highway Pavement. *Case Western Reserve University Research Showcase*. Cleveland, Ohio, USA.
1. **Hlasko, H. A.**, & Zeng, X. (2006, January). Cone Penetrometer Equipped with Piezoelectric Sensors for Measurement of Soil Stiffness in Highway Pavement. *85th Annual Transportation Rersearch Board Meeting*. Washington D.C., USA.

PUBLISHED ARTICLES

2. Creager, C.M., Asnani, V.M., Oravec, H.A., and Woodward, A. (2017, August). Drawbar Pull (DP) Procedures for Off-Road Vehicle Testing. NASA/TP-2017-219384.
1. Daniels, C.C., Braun, M.J., **Oravec, H.A.**, Mather, J.L., and Taylor, S.C. (2016, July). Improved Method to Quantify Leak Rates. *NASA Tech Briefs, 40*(7), 23-24.

PRESS RELEASES

5. "WINNER of NASA contest shows to to mine Moon rocks to make tiles." Megan Crouse, *Product Design & Development*, May 2016. https://www.pddnet.com/news/2016/05/winner-nasa-contest-shows-how-mine-moon-rocks-make-tiles
4. "NASA announces winning concepts to further its journey to Mars." *NASA*, March 2016. http://www.nasa.gov/press-release/nasa-announces-winning-concepts-to-further-its-journey-to-mars
3. "NineSigma announces winners of NASA tournament lab innovation challenges." *SpaceRef*, March 2016. http://spaceref.com/news/viewpr.html?pid=48142
2. "NASA selects UA students' spacesuit testing proposal." Dylan Reynolds, *The Buchtelite*, February 2016. http://buchtelite.com/30669/showcase/nasa-selects-ua-students-spacesuit-proposal/
1. "Building a better space suit – NASA selects proposal by UA students." *The University of Akron,* February 2016. https://www.uakron.edu/im/news/building-a-better-space-suit-nasa-selects-proposal-by-ua-students/

TECHNICAL REPORTS – FOR FUNDING AGENCIES

102.	(2016, Dec)	AVCaD Volume Measurements for Interior, Exterior, and Interstitial Sections of the Docking Hatch Test Fixture Assembly (Rev A)
101.	(2016, Dec)	Orion MPCV EDU-1 Docking Hatch P-3 Configuration Leak Rate Tests at Various Temperatures (Rev A)
100.	(2016, Dec)	Orion MPCV EDU-1 Docking Hatch P- Configuration Leak Rate Tests at 18°C (Rev A)
99.	(2016, Dec)	Orion MPCV EDU-1 Docking Hatch P-3 Configuration Leak Rate Tests with Various Preconditioning Times (Rev A)
98.	(2016, Nov)	Electrostatic Attraction of JSC-1A Particles to a Conductive Hollow Core O-ring: A Visual Investigation
97.	(2016, Oct)	AVCaD Volume Measurements for Interior, Exterior, and Interstitial Sections of the Docking Hatch Test Fixture Assembly
96.	(2016, Oct)	Orion MPCV EDU-1 Docking Hatch P-3 Configuration Leak Rate Tests at Various Temperatures
95.	(2016, Oct)	Orion MPCV EDU-1 Docking Hatch P- Configuration Leak Rate Tests at 18°C
94.	(2016, Oct)	Orion MPCV EDU-1 Docking Hatch P-3 Configuration Leak Rate Tests with Various Preconditioning Times
93.	(2015, Nov)	Results of Adhesion Tests on Hollow O-Rings Using a 1 Kip Load Cell
92.	(2015, Nov)	Results of Adhesion Tests on Hollow O-Rings Pretreated with Atomic Oxygen (Rev A)
91.	(2015, Oct)	Results of Adhesion Tests on Hollow O-Rings Pretreated with Atomic Oxygen
90.	(2015, June)	Preliminary Compression Tests on Potential Conductive Hollow O-rings for the Multi-Purpose Crew Vehicle Docking Hatch
89.	(2015, June)	Research Report for the Combined Compression and Leak Rate Tests on Hollow O-rings for the Multi-Purpose Crew Vehicle Docking Hatch

88. (2015, June) Adhesion Force Measurement of Fourth Generation Medium-Scale Silicone Elastomer Seals After Mechanical Removal of Santovac 5GB and Braycote Micronic 601 EF Coating

87. (2015, May) Results of Compression and Adhesion Tests on Fourth Generation Medium-Scale Silicone Elastomer (S0383-70) Seals with TiO2 Additive After Exposure to Atomic Oxygen and Ultraviolet Radiation

86. (2015, May) Results of Adhesion tests on Fourth Generation Medium-Scale Silicone Elatomer Seals Treated with Santovac 5GB and Braycote Micronic 601 EF Coating and Exposed to Atomic Oxygen and Ultraviolet Radiation

85. (2015, April) Results of Compression and Adhesion Tests on Hollow O-rings at Various Temperatures for the Multi-Purpose Crew Vehicle Docking Hatch

84. (2015, Feb) Results of Compression and Adhesion Tests on Hollow and Solid O-Rings for the Multi-Purpose Crew Vehicle Docking Hatch

83. (2015, Jan) Results of Compression and Adhesion Tests on Fourth Generation Medium-Scale Silicone Elastomer (S0383-70) Seals with TiO2 Additive

82. (2014, June) Results of Baseline Adhesion Tests on Fourth Generation Medium-Sale Silicone Elastomer Seals Treated with Braycote Micronic 601 EF Coating

81. (2014, May) Results of Adhesion Screening Tests on Fourth Generation Medium-Scale Silicone Elastomer Seals for the Evaluation of Potential Ultraviolet Radiation Resistant Seal Coatings

80. (2013, Jan) Analysis of the Cyclic Compression Testing on the Seal Bulbs of UV/AO Pretreated Medium-Scale Two-Piece Generation 4 S0383-70 Material Seals

79. (2013, Jan) Analysis of the Room Temperature Compression Tests on Fourth Generation Medium-Scale S0383-70 Material Engineering Demonstration Unit Engineering Sample Seals

78. (2013, Jan) Compression Analysis and Process Control of the Test Data from Fourth Generation Medium-Scale S0383-70 Material Seals

77. (2013, Jan) Analysis of the Cooling Rate of a Fourth Generation Medium-Scale S0383-70 Material Seal Compared to the cooling Rate of the Metal Platens and Environmental Chamber

76. (2013, Jan) Analysis of the Compression Tests on Fourth Generation Medium-Scale S0383-70 Material Seals at -50°C with Temperature Soak Times of Three Hours and 16 Hours

75. (2012, Oct) Analysis of Adhesion Testing of Medium-Scale Two-Piece Generation 4 S0383-70 Material Seal Witness Specimens Pretreated with Atomic Oxygen at the Same time as Full-Scale EDU Seals

74. (2012, Sept) Analysis of Cyclic Compression Testing on the Seal Bulbs of Medium-Scale Two-Piece Generation 4 S0383-70 Material Seals

73. (2012, Sept) Analysis of Adhesion Tests Supporting the Selection of Adhesion Reduction Specification Atomic Oxygen Pretreatment Levels for Medium-Scale Two-Piece Generation 4 S0383-70 Material Seals Pretreated at Six-Inch Plate Spacing

72. (2012, Sept) Analysis of the Compression and Adhesion Testing of 12-inch Diameter Two-Piece Gen3 S0383-70 UV-Inhibited Seals in a Seal-on-Plate Configuratino at Various Test Temperatures

71. (2012, Aug) Analysis of the Adhesion Testing of Two Medium-Scale Two-Piece Generation 4 S0383-70 Material Seal Witness Specimens Pretreated with Atomic Oxygen at the Same Time as Full-Scale EDU Seals (Rev A)

70. (2012, July) Analysis of the Adhesion Testing of a Medium-Scale Two-Piece Generation 4 S0383-70 Material Seal Witness Specimen Pretreated with Atomic Oxygen at the Same time as a Full-Scale EDU Seal

69. (2012, July) Analysis of the Compression and Adhesion Testing of 12-inch Diameter Two-Piece Gen3 S0383-70 UV-Inhibited Seals in a Seal-on-Plate Configuratino at Various Test Temperatures

68. (2012, June) Analysis of Additional Adhesion Tests Supporting the Selection of Adhesion Reduction Specification Atomic Oxygen Pretreatment Levels for Medium-Scale Two-Piece Generation 4 S0383-70 Material Seals at Refrigerated Temperatures

67. (2012, June) Analysis of Adhesion Tests Supporting the Selection of Adhesion Reduction Specification Atomic Oxygen Pretreatment Levels for Medium-Scale Two-Piece Generation 4 S0383-70 Material Seals at Refrigerated Temperatures

66. (2012, May) Analysis of Preliminary Long Duration Adhesion Tests Supporting the Selection of Adhesion Reduction Specification Atomic Oxygen Pretreatment Levels for Medium-Scale Two-Piece Generation 4 Momentive 70 Material Seals at Refrigerated Temperatures

65. (2012, April) Analysis of the Compression Testing on the Seal Bulbs of Medium-Scale Two-Piece Generation 4 S0383-70 Material Seals

64. (2012, March) Analysis of the Compression Testing on Retention Features of Medium-Scale Two-Piece Generation 4 S0383-70 Material Seals

63. (2012, Feb) Analysis of the Pre- and Post-Vibration Compression Testing of a 12-inch Diameter Two-Piece Generation 4 Momentive 70 Seal in a Seal-on-Plate Configuration at 23°C

62. (2012, Jan) Finalization of the Medium-Scale Compression Test Data Analysis Method for Determining the Compression Force Measurements

61. (2012, Jan) Analysis of the Compression and Adhesion Testing of Gen3 Medium-Scale Two-Piece Momentive 70 Seals in a Seal-on-Plate Configuration with Exposure to Various Simulated Space Environments

60. (2010, Nov) Analysis of the Compression Testing of a 12 inch Diameter 2-Piece Gen2 Momentive 70 Seal (12in2PG2M70-7-003) in the Seal-on-Plate Configuration as Compared to Corresponding Plate-on-Plate Tests Without a Seal to Determine the Position at Which Full Seal Compression Occurs

59. (2011, Nov) Analysis of the Compression and Adhesion Testing of a 12 inch Diameter 2-Piece Gen2 Momentive 70 Seal (12in2PG2M70-7-003) with Various Maximum Material Conditions in the Seal-on-Plate Configuration at Various Temperatures

58. (2011, Nov) Analysis of the Compression and Adhesion Testing of a 12 inch Diameter 2-Piece Gen2 Momentive 70 Seal of the incorrect size (12in2PG2M70-7-009_IS) with Various Maximum Material Conditions in the Seal-on-Plate Configuration at Various Temperatures

57. (2011, Nov) Analysis of the Compression and Adhesion Testing of 12 inch Diameter 2-Piece Gen2 Momentive 70 Seals in the Seal-on-Seal Configuration at Various Temperatures

56. (2011, Nov) Analysis of the Compression and Adhesion Testing of a 12 inch Diameter 2-Piece Gen2 Momentive 70 Seal of the Incorrect Size (12in2PGM70-7-010_IS) the Seal-on-Plate Configuration at Various Temperatures

55. (2011, Nov) Analysis of the Compression and Adhesion Testing of a 12 inch Diameter 2-Piece Gen2 Momentive 70 Seal of the Incorrect Size in the Seal-on-Plate Configuration at Various Temperatures

54. (2011, Nov) Analysis of an Additional Repeat Long Duration Adhesion Test on a Post-Scrub Two-Piece Gen 2 Momentive 70 Material Seal of Incorrect Size in a Seal-on-Place Configuration Held in Compression at Room Temperature for 24 Hours

53. (2011, Oct) Analysis of 8-Hour Adhesion Tests on Medium-Scale CBM S0383-70 Elliptical and Flat Top Seals Tested in a Seal-on-Plate Configuration at -50°C with Various Surface Treatments

52. (2011, Oct) Analysis of the Compression and Adhesion Testing of 12-inch Diameter Two-Piece Gen3 Momentive 70 Seals in a Seal-on-Seal Configuration at Various Test Temperatures

51. (2011, Oct) Analysis of the Compression and Adhesion Testing of 12-inch Diameter Two-Piece Gen3 Momentive 70 Seals in a Seal-on-Plate Configuration at Various Test Temperatures

50. (2011, Oct) Analysis of a Long Duration Adhesion Test on Two-Piece Gen 2 Momentive 70 Material Seals in a Seal-on-Seal Configuration Held in Compression at Room Temperature for Five Months

49. (2011, Sept) Analysis of a Repeat Long Duration Adhesion Test on a Post-Scrub Two-Piece Gen 2 Momentive 70 Material Seal of Incorrect Size in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 24 Hours

48. (2011, Sept) Force Values Required to Fully Compress H-Seals at Various Test Temperatures

47. (2011, Aug) Analysis of Long Duration Adhesion Tests on Medium-Scale CBM S0383-70 Elliptical and Flat Top Seals in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 25 Hours

46. (2011, Aug) Analysis of a Long Duration Test on a Two-Piece Gen 2 Momentive 70 Material Seal in a Seal-on-Plate Configuration Held in Compression at +23°C for 96 Hours

45. (2011, Aug) Analysis of Compression and Adhesion Testing of 12 inch Diameter Two-Piece Gen3 Momentive 70 Seals in a Seal-on-Plate Configuration at 61°C with Polymeric Shims to Simulate Various Maximum Material Height Conditions

44. (2011, July) Estimation of the Clipping Error Resulting from an Adhesion Test on a 12 inch Diameter Two-Piece Gen2 Momentive 70 Seal in a Seal-on-Plate Configuration at Room Temperature in B:5 R:SE-14 Station 6

43. (2011, July) Analysis of the Compression Testing of Modified 12 inch Diameter 2-Piece Gen2 Momentive 70 Seals Using Three Different Test Configurations at Various Temperatures and Maximum Material Conditions

42. (2011, June) Analysis of the Center Preload Button Compression Testing on a 12 inch Diameter Two-Piece Gen3 Momentive 70 Seal at 23°C Test Temperature

41. (2011, June) Analysis of the Compression and Adhesion Testing of a 12 inch Diameter Two-Piece Gen3 Momentive 70 Seal in a Seal-on-Plate Configuration at 61°C with Polymeric Shims to Simulate a Gen4 Momentive 70 Seal with Maximum Material Height in its First Docking Cycle on Orbit

40. (2011, June) Analysis of the Recovery Force Testing of a Modified 12 inch Diameter 2-Piece Gen2 Momentive 70 Seal in a Seal-on-Plate Configuration at 75°C with Maximum Material Conditions

39. (2011, June) Analysis of the Compression and Adhesion Testing of an AO Treated 12-inch Diameter 2-Piece Gen2 Momentive 70 Seal in a Seal-on-Plate Configuration at -50°C and Cleaned with Isopropyl Alcohol

38. (2011, June) Analysis of a Long Duration Adhesion Test on Two-Piece Gen 2 Momentive 70 Material Seals in a Seal-on-Seal Configuration Held in Compression at +23°C for 42 Days and Then Cooled to -50°C for 24 Hours

37. (2011, June) Analysis of Repeat Long Duration Adhesion Tests on Pre-Scrub Two-Piece Gen 2 Momentive 70 Material Seals of Incorrect Size in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 24 Hours

36. (2011, June) Analysis of a Long Duration Adhesion Test on a Post-Scrub Two-Piece Gen 2 Momentive 70 Material Seal of Incorrect Size in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 24 Hours

35. (2011, May) Analysis of the Compression and Adhesion Testing of a 12 inch Diameter Two-Piece Gen3 Momentive 70 Seal in a Seal-on-Plate Configuration at 61°C with Polymeric Shims to Simulate a Gen4 Momentive 70 Seal in its First Docking Cycle on Orbit

34. (2011, May) Analysis of the Compression and Adhesion Testing of 12 inch Diameter Two-Piece Gen3 Momentive 70 Seals in a Seal-on-Plate Test Configuration at Various Temperatures and Maximum Material Conditions

33. (2011, May) Compression Force Recovery of a Modified 12 inch Diameter Two-Piece Gen2 Momentive 70 Seal in a Seal-on-Plate Configuration at Room Temperature

32. (2011, May) Analysis of a Long Duration Adhesion Tests on Two-Piece Gen 2 Momentive 70 Material Seals in a Seal-on-Seal Configuration Held in Compression at +23°C for 14 Days and then Cooled to -50°C for 24 Hours

31. (2011, May) Analysis of a Long Duration Adhesion Tests on a Pre-Scrub Two-Piece Gen 2 Momentive 70 Material Seal of Incorrect Size in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 24 Hours

30. (2011, May) Analysis of a Repeat Long Duration Adhesion Tests on a Post-Scrub Two-Piece Gen 2 Momentive 40 Material Seal in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 24 Hours

29. (2011, May) Analysis of a Long Duration Adhesion Tests on a Post-Scrub Two-Piece Gen 2 Momentive 40 Material Seal in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 24 Hours

28. (2011, April) Analysis of the Compression and Adhesion Testing of 12-inch Diameter Two-Piece Gen3 Momentive 70 AO Pretreated Seals in Various Configurations and at Multiple Test Temperatures

27. (2011, April) Analysis of a Long Duration Adhesion Tests on a Two-Piece Gen 2 Momentive 70 Material Seal in a Seal-on-Plate Configuration Held in Compression at Varying Temperatures

26. (2011, April) Analysis of a Long Duration Adhesion Test on Two-Piece Gen 2 Momentive 70 Material Seals in a Seal-on-Seal Configuration Held in Compression at +23°C for 13 Days and Then Cooled to -50°C for 24 Hours

25. (2011, March) Analysis of a Long Duration Adhesion Test on a 12 inch Two-Piece Kirkhill Seal in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 26 Days and Then Cooled to -50°C for 24 Hours

24. (2011, March) Analysis of Long Duration Adhesion Tests on 8 inch Diameter ODS (APAS) Seals in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 27 Days and Then Cooled to -50°C for 24 Hours

23. (2011, March) Analysis of the Compression Testing of a Modified 12 inch Diameter Two-Piece Gen2 Momentive 70 Seal in a Seal-on-Plate Configuration at Room Temperature

22. (2011, March) Analysis of Long Duration Adhesion Tests on Two-Piece Gen 2 Momentive 70 Material Seals in a Seal-on-Plate Configuration Held in Compression at +75°C for 13 Days and Then Cooled to -50°C for 24 Hours

21. (2011, March) Analysis of Long Duration Adhesion Tests on Two-Piece Gen 2 Momentive 70 Material Seals in a Seal-on-Plate Configuration Held in Compression at -50°C for Three Weeks

20. (2011, March) Analysis of Long Duration Adhesion Tests on Two-Piece Gen 2 Momentive 70 Material Seals in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 12 Days and Then Cooled to -50°C for 24 Hours

19. (2011, March) Analysis of Long Duration Adhesion Tests on Two-Piece Gen 2 Momentive 40 Material Seals in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 24 Hours

18. (2011, March) Analysis of a Long Duration Adhesion Test on A Double AO Exposed Two-Piece Gen 2 Momentive 70 Material Seal in a Seal-on-Plate Configuration Held in Compression at Room Temperatuer for 26 Days and Then Cooled to -50°C for 24 Hours

17. (2011, March) Analysis of a Long Duration Adhesion Test on a Two-Piece Gen 2 Momentive 70 Material Seal in a Seal-on-Plate Configuration Held in Compression at +75°C for Five Days and Then Cooled to -50°C for 24 Hours

16. (2011, March) Analysis of Long Duration Adhesion Tests on 2-Piece Gen 2 Momentive 70 Material Seals in a Seal-on-Plate Configuration Held in Compression at -30°C for Four Weeks

15. (2011, March) Analysis of a Long Duration Adhesion Test on Two-Piece Gen 2 Momentive 70 Material Seal in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 20 Days and Then Cooled to -50°C for 24 Hours (Rev A)

14. (2011, March) Analysis of a Long Duration Adhesion Test on Two-Piece Gen 2 Momentive 70 Material Seal in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 20 Days and Then Cooled to -50°C for 24 Hours
13. (2011, March) Analysis of a Long Duration Adhesion Test on a Two-Piece Gen 2 Momentive 70 Material Seal in a Seal-on-Plate Configuration Held in Compression at Room Temperature for 17 Days and Then Cooled to -50°C for 24 Hours
12. (2011, Feb) Analysis of the Compression Force Testing of a 12 inch Kirkhill Two-Piece Seal Assembly Mated in a Seal-on-Plate Configuration with Various Inter-Cycle Rest Times
11. (2011, Feb) Analysis of the Compression Testing of a Modified 12 inch Diameter 2-Piece Gen2 Momentive 70 Seal in a Seal-on-Plate Configuration at +61°C with Maximum Material Conditions
10. (2011, Feb) Analysis of the Compression Testing of 12 inch Diameter 2-Piece Gen2 Momentive 70 Seals in Three Different Seal-on-Plate Configurations to Characterize and Verify the Full Seal Compression Force Value
9. (2011, Feb) Analysis of the Compression and Adhesion Testing of an AO Treated 12 inch Diameter 2-Piece Gen2 Momentive 70 Seal in a Seal-on-Plate Configuration at -50°C and Cleaned with Isopropyl Alcohol
8. (2011, Feb) Analysis of Long Duration Adhesion Tests on Two-Piece Gen 2 Momentive 70 Material Seals in a Seal-on-Plate Configuration Held in Compression at -50°C for 2 Weeks
7. (2011, Feb) Analysis of Long Duration Adhesion Tests on Two-Piece Gen 2 Momentive 70 Material Seals in a Seal-on-Plate Configuration Held in Compression at -50°C for 1 Week
6. (2011, Feb) Analysis of Long Duration Adhesion Tests on Two-Piece Gen 2 Momentive 70 Material Seals in a Seal-on-Plate Configuration Held in Compression at Various Test Temperatures for 24 Hours
5. (2011, Jan) Analysis of the Compression Testing of Modified 12 inch Diameter 2-Piece Gen2 Momentive 70 Seals Using Three Different Test Configurations at Various Temperatures and Maximum Material Conditions
4. (2011, Jan) Analysis of Long Duration Adhesion Tests on 2-Piece Gen 2 Momentive 70 Material Seals in a Seal-on-Plate Configuration Held in Compression at Different Temperatures but Separated at the Same Temperature
3. (2010, Dec) Analysis of Long Duration Adhesion Tests on 4 inch Diameter Momentive 70 Gask-O-Seal Design Seals in a Seal-on-Plate Configuration at Two Test Temperatures
2. (2010, Dec) Analysis of Long Duration Adhesion Tests on 2-Piece Gen 2 Momentive 70 Material Seals in a Seal-on-Plate and Seal-on-Seal Configuration
1. (2010, Nov) Analysis of the Compression Testing of 12 inch Diameter 2-Piece Gen2 Momentive 70 Seals in Three Different Seal-on-Plate Configurations to Characterize and Verify the Full Seal Compression Force Value

PATENTS AND APPLICATIONS

Daniels, C.C., Braun, M.J., Mather, J.L., **Oravec, H.A.**, Penney, N., & Taylor, S.C. *Apparatus and Method for Quantifying Gas Loss in a Closed System.* U.S. Utility Patent Application. Filed 02-Feb 2016.

PROFESSIONAL MEMBERSHIP

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (2017-PRESENT)

- Member

AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS (2011-Present)

- Member

CLEVELAND STATE UNIVERSITY ALUMNI ASSOCIATION (2004-2006)

- Co-President and Treasurer for the Engineering Alumni Association (2005-2006)
- Member of the Events and Activities Committee (2005-2006)
- Secretary for the Engineering Alumni Association (2004-2005)

TAU BETA PI ENGINEERING HONOR SOCIETY (2002–Present)

- Cleveland State University Chapter President (2003-2004)

AMERICAN SOCIETY OF CIVIL ENGINEERS (2000-2009)

- 2005 Regional Steel Bridge Competition Participant (Ann Arbor, Michigan)
- 2003 National Steel Bridge Competition Participant (San Diego, California)
- 2003 Regional Steel Bridge Competition Participant (Lexington, Kentucky)

SOCIETY OF WOMEN ENGINEERS (2000-2008)

- Member

CLEVELAND STATE UNIVERSITY JOINT ENGINEERING COUNCIL (2000-2004)

- President (2003- 2004)

CERTIFICATIONS AND RELEVANT SKILLS

- Engineer-In-Training (EIT) certification (October 2004)
- Skilled in Microsoft Windows and Microsoft Office Suite
- Programming knowledge in LabVIEW, MATLAB, and LaTeX
- Experience with AutoCAD, ARCview, SLOPE/W, ProSheet, LPILE, SAP2000, SolidWorks
- Skilled in Adobe CS6

TRAINING

•LabVIEW Core II Training •Respiratory Protection Air Purifying Training •Safeguarding Sensitive But Unclassified Information •Annual GRC Environmental Management System (EMS) Training •Basic IT Security •GRC Annual Security Briefing •GRC 102: Plum Brook Station •SHE 124: Equivalent Cryogenics Safety Training •Cryogenics Safety •MATLAB/Agilent Hands On Workshop •Safety Stand-Down Dialogue Session •LC Blood Borne Pathogens Always protect Yourself •Hazard Communication and Chemical Hygiene All-Staff Awareness Training •LC Lockout/Tagout: Life & Death Series •LC Hazards of Liquefied & Compressed Gases •Hazard Communication Training •Laser Awareness Training •GRC Laser Safety Training Module •Resource Conservation & Recovery Act (RCRA) – Hazard Waste management Training •Annual Information Security Training •Workplace Violence and High Risk Conflict Resolution Training •Basics of Environmental, Health, and Safety Training •Radioactive Material Transportation for Portable Nuclear Gauge •Radiation Safety Concepts •Portable Nuclear Gauge Operation and Use •Manufacturer's Course on Portable Nuclear Gauge Operation and Use •GRC Radiation Safety Training for Radioactive Materials •Elevated Privileges on NASA Information Systems •IT Security for Systems Administrators – Beginning Level •Control and Maintenance of Measuring and Test Equipment •Electrical Safety What Everyone Should Know •Project Planning Analysis and Control •Heart Saver First Aid Training •LC RCRA Large Quantity Generators •NASA Glenn Mentoring Online Training •Using Nature's Toolbox to Apply the Biomimetic Process at NASA: A Practical, Approach to Biomimicry •Student Safety and Health Course for Mentors •Introduction to Statistical Design of Experiments •Grant Writing Workshop •Crane Operator & Safety Training •LaTeX Workshop

HONORS AND AWARDS

SPACE FLIGHT AWARENESS TEAM AWARD (2017)
- In recognition of excellent contributions as a valued team member in support of NASA's human spaceflight programs.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS PROPULSION BEST PAPER (2016)
- Co-authored technical paper titled, "Leak Rate Quantification Method for Gas Pressure Seals with Controlled Pressure Differential," awarded the American Society of Mechanical Engineers Propulsion Best Paper by the ASME Liquid Propulsion Committee at the 52nd AIAA/SAE/ASEE Joint Propulsion Conference in Salt Lake City, UT.

NINE SIGMA NASA CHALLENGE I: TEXTILE TEST METHOD (2016)
- Co-mentored The University of Akron student team that submitted a winning proposal on how to test spacesuit material for performance in different kinds of planetary environments.

THE UNIVERSITY OF AKRON FIVE YEAR SERVICE AWARD (2015)
- Awarded to an employee after five years of continuous service and dedication to The University of Akron.

NASA POSTDOCTORAL PROGRAM FELLOWSHIP RECIPIENT (2009-2010)
- A one to three year fellowship offering research opportunities to highly talented individuals to engage in ongoing NASA research programs.

CRAIG J. MILLER MEMORIAL AWARD (2009)
- Awarded to a student who has shown outstanding academic achievement in civil engineering.

CLOVERLEAF ACADEMIC HALL OF FAME (2009)
- Recognizes a student from Cloverleaf High School who has earned an advanced degree.

SAADA FAMILY GRADUATE FELLOWSHIP RECIPIENT (2006-2009)
- A three year fellowship awarded to a most deserving graduate student pursuing an advanced degree in one of the disciplines in civil engineering.

COMMUNITY SERVICE

LEWIS LITTLE FOLKS, CLEVELAND, OH (July 2017–present)
- Board of Trustees Member-at-Large.

LEWIS LITTLE FOLKS, CLEVELAND, OH (2016–present)
- Member of the Staff Appreciation Committee.

REVOLUTION THREE TRIATHLON, NATIONAL (2011–2014)
- Member of the national amateur age group triathlon team.
- Participant in sprint, Olympic, half, and full-distance triathlons throughout the United States promoting the family friendly Rev3 race series.
- Teamed with the Ulman Cancer Fund to help raise money and awareness for youth cancer research.

LEUKEMIA AND LYMPHOMA SOCIETY, NORTHERN OH (2010–2013)
- Participant and coach for Team in Training endurance events to raise money and awareness for blood cancer research.
- Personally raised in excess of $18,000 for the Leukemia and Lymphoma Society.

THE ORAL CANCER FOUNDATION, CLEVELAND, OH (2010)
- Assisted in organizing the Inaugural Cleveland Oral Cancer Walk in 2010.
- Helped raise awareness for oral cancer and over $10,000 in donations for the Oral Cancer Foundation.

MACEDONIA GIRLS FASTPITCH SOFTBALL U9, MACEDONIA, OH (2010)
- Pitching coach.

MC2STEM HIGH SCHOOL, CLEVELAND, OH (2010)
- Math tutor for high school students preparing for the Ohio Graduation Test.

SAINT COLUMBKILLE CATHOLIC CHURCH, PARMA, OH (2007)
- Youth retreat volunteer.