



SMU

Curriculum Vitae of
Benjamin J.A. Wise

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Benjamin J.A. Wise

Mechanical/Aerospace Engineering

Objective Experienced and published graduate researcher, with a lifelong passion for Engineering and over 5 years of laboratory experience, who is looking to utilize theoretical and practical knowledge to advance the fields of Aerospace and Mechanical Engineering by pursuing a Ph.D. or Dr. Eng.

Education

2016 - 2018, Southern Methodist University

M.S. in Mechanical Engineering

GPA: 3.962

Advisor: M. Volkan Ötügen

Thesis: *A Microresonator-Based Laser Doppler Velocity Sensor For Interplanetary Atmospheric Re-Entry*

2011 - 2016, Southern Methodist University

Cumulative GPA: 3.838

B.S. in Mechanical Engineering, *cum laude*

GPA: 3.869

B.S. in Mathematics, *cum laude*

GPA: 3.800

B.S. in Physics, *cum laude*

GPA: 3.791

Minor in Computer Science

With Honors in the Liberal Arts

Experience

Sept. 2013 - Aug. 2018, Research Assistant, Micro-Sensor Laboratory, SMU

Worked individually and with a team of high school, undergraduate, and graduate students on a number of micro-scale sensing projects, such as:

- Electric Field Sensing for Advanced Prosthetic Application
 - The development of micro-scale WGM-based spherical sensors, to design implantable, bio-compatible E-Field sensors for direct nerve control of advanced prosthetic devices.
 - The study of time-dependent dielectric polarization and response of PDMS based cantilever beams, with a focus of enhancing the sensitivity and bandwidth of WGM E-Field sensors.
 - The development of methods for coating commercially available hollow micro-spheres in optical PDMS, to improve response of WGM-based E-Field sensors to transient signals.
 - Micro-fluidic fabrication methods for producing hollow optical PDMS micro-spheres via flow-focusing, with an aim to produce thin walled, low mass sensors for sensing high frequency transient signals.
- Laser Velocimetry for Mars Entry Descent and Landing (EDL) Operations
 - Developing a miniaturized, low weight, high measurement resolution system to accurately determine relative velocity between a Mars Lander and atmospheric particles, to improve probability of success of EDL Operations.

Aug. 2012 - Aug. 2013, Undergraduate Research Assistant, SuperCDMS Laboratory, SMU

Assisted in the creation and population (via data import scripts) of the radiopurity.org database, currently the largest public database of material radio-purity measurements used by the low-background particle physics community to design and build experiments.

Aug. 2011 - Aug. 2012, Student OIT Assistant, Office of Information Technology, SMU

Assisted in the administration and maintenance of multiple computational servers, as well as student and faculty computers, including helping faculty with computation requirements of their research.

Publication

2018, Presentation and Conference Paper, AIAA 2018 SciTech Forum

Benjamin J. Wise, Vahid Eghbalifarkoosh, Volkan Ötügen, and Dominique Fourquette, "A Microresonator Based Laser Velocity Sensor", *2018 AIAA Aerospace Sciences Meeting*, AIAA SciTech Forum, (AIAA2018-1770). DOI:10.2514/6.2018-1770

Poster Presentations

2017, Poster Presentation, Lyle School of Engineering Research Day Expo

Wise, B.J.A., DaSilva, J., Salameh, E.R., and Ötügen, M.V. (2017). "An Improved Compact Atmospheric Speed Sensor for Mars Missions." Lyle Research Day Expo.

2016, Poster Presentation, Lyle School of Engineering Research Day Expo

Wise, B.J.A., Eghbalifarkoosh, V., and Ötügen, M.V. (2016). "A Compact Atmospheric Entry Speed Sensor for Mars Missions." Lyle Research Day Expo.

Presentations

2018, *Presentation, Bluebonnet Symposium on Thermal-Fluid Sciences*

Wise, B.J.A., DaSilva, J., Salameh, E.R., and Ötügen, M.V. (2018). "An Improved Compact Atmospheric Speed Sensor for Mars Mission" Bluebonnet Symposium on Thermal-Fluid Sciences, held at the University of Texas at Dallas, with scientists and engineers in attendance from the Texas-Oklahoma-Louisiana Area.

2015, *Presentation, Lyle School of Engineering Recruitment Event*

Wise, B.J.A. and Ötügen, M.V. (2015). "Hollow Microsphere Resonators for Advanced Prosthetics." Lyle School of Engineering Recruitment Event for group of approximately 500 prospective students and parents.

Skills and Knowledge

Programming and Computer Software Knowledge

- SolidWorks
- 3D Printing/CNC
- Mathematica
- Matlab
- LabView
- LaTeX
- BASH Shell
- Python
- Java
- C++

Laboratory and Technical Skills

- Responsible Conduct of Research Training (CITI: Oct. 2016, SMU [NOT-OD-10-019 Compliant]: Mar. 2018)
- Chemical Safety
- Laser Safety
- Optical Alignment
- Inventory & Time Management
- Troubleshooting Experiments
- Basic Signal Processing (e.g., Auto and Cross Correlation)

Relevant Engineering Coursework

Design and Manufacturing

- Vibrations
- Intermediate Dynamics
- Manufacturing Processes
- Vehicle Dynamics
- Classic Mechanics
- Engineering Materials
- Optics & Laser Aided Manufacturing Processes

Thermo-Fluids

- Thermodynamics
- Statistical Mechanics
- Thermal Systems Design
- Fluid Mechanics
- Gas Dynamics & Analysis of Propulsion Systems
- Intermediate Heat Transfer

Modeling and Control of Systems

- Laboratory Physics
- Circuit Analysis
- Linear Systems Analysis
- Optimal & Robust Control
- Design & Control of Mechanical Systems
- Concepts of Experimental Physics
- Scientific High Performance Computing

Honors and Awards

2014-	<i>Robert S. Hyer Society Member, SMU</i>	SMU's most prestigious Honor Society
2014-	<i>Phi Beta Kappa Member, SMU</i>	The Nation's Oldest Academic Honor Society
2014-	<i>Tau Beta Pi Member, SMU</i>	The Engineering Honor Society
2014-	<i>Pi Tau Sigma Member, SMU</i>	The International Honor Society for Mechanical Engineers
2014	<i>Robert S. Hyer Outstanding Physics Student Award, SMU</i>	
2013	<i>W.J. McDonald Outstanding Physics Student Award, SMU</i>	
2011-16	<i>Engineering Fellows Scholar, SMU</i>	

Organizations and Leadership Experience

2017-	<i>Student Member</i>	American Institute of Aeronautics and Astronautics
2016-17	<i>Regional Director</i>	Theta Tau Professional Engineering Fraternity (National Officer)
2015-16	<i>Regent (President)</i>	Theta Tau Fraternity, Tau Beta (SMU) Chapter Officer
2014-15	<i>Scribe (Secretary)</i>	Theta Tau Fraternity, Tau Beta (SMU) Chapter Officer
2012-	<i>Student Member</i>	American Society of Mechanical Engineers
2011-	<i>Member</i>	American Mensa, <i>The Largest and Oldest High IQ Society in the World</i>

Interests

Professional

Sensor Application/Design, Micro-Optical Devices, Laser/Lidar Devices, Thermo-Fluids and Propulsion Systems, Systems Integration, and Computational Electrodynamics/Fluid Dynamics

Personal

Habitat for Humanity, SCUBA diving (NAUI Advanced Open Water and Enriched Air Diver), Welding (Shielded Metal Arc, GMAW/MIG, and Oxyacetylene), Building, Cooking, Baking, and Zymurgy