



University
of Colorado
Boulder

Curriculum Vitae of
Benjamin J.A. Wise

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Benjamin J.A. Wise

AEROSPACE ENGINEERING SCIENCES

Education

2018 - Present, University of Colorado at Boulder

Ph.D. in Aerospace Engineering Sciences

Remote Sensing, Earth, and Space Sciences Specialization

GPA: 3.871

Advisor: Jeffrey Thayer

2016 - 2018, Southern Methodist University

M.S. in Mechanical Engineering

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

GPA: 3.962

Advisor: M. Volkan Ötügen

2011 - 2016, Southern Methodist University

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

B.S. in Mathematics, *cum laude*

B.S. in Physics, *cum laude*

Minor in Computer Science

With Honors in the Liberal Arts

Cumulative GPA: 3.838

GPA: 3.869

GPA: 3.800

GPA: 3.791

Experience

Aug. 2018 - Present, Doctoral Student, Active Remote SENSing Lab (ARSENL), CU Boulder

- Worked with colleagues to brainstorm, write, and apply for various national graduate research fellowships, scholarships, and grants.
- Developed and CAD modeled a lift system to safely raise operational LIDAR equipment to (and through) a roof hatch in new Smead Aerospace Building at CU Boulder, to improve off-nadir pointing and expand research capabilities.
- Clarified code and expanded capabilities of LIDAR Acquisition System Code.
- Currently onboarding with regard to current and past ARSENL research activities.

Fall 2018, Teaching Assistant, Intro to Thermodynamics and Aerodynamics, CU Boulder

- Responsibilities included: Marking exams and lab reports, creating detailed homework solution sets, holding office hours, proctoring exams (mid-term and final), and supervising labs.
- Instructional Team: 3 Lead Instructors, 4 Teaching Assistants, 2 Class Assistants
- Class Size: 249 Students

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.
- 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.

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/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 Manufacturing.
- Thermo-Fluids:**
 - Thermodynamics
 - Statistical Mechanics
 - Thermal Systems Design
 - Fluid Mechanics
 - Gas Dynamics & Analysis of Propulsion Systems
 - Intermediate Heat Transfer
- Modeling and Controls:**
 - Laboratory Physics
 - Circuit Analysis
 - Linear Systems Analysis
 - Design & Control of Mechanical Systems
 - Optimal & Robust Control
- Scientific High Performance Computing
- Concepts of Experimental Physics
- Remote Sensing:**
 - Radar & Remote Sensing
 - Random Processes
 - Engr. Data Analysis Methods

Honors and Awards

- 2018 *Dean's Graduate Award, CU Boulder*
- 2014 *Robert S. Hyer Outstanding Physics Student Award, SMU*
- 2013 *W.J. McDonald Outstanding Physics Student Award, SMU*
- 2011-16 *Engineering Fellows Scholar, SMU*

Organizations and Leadership Experience

- 2018- *Student Member* American Geophysical Union
- 2017- *Student Member* American Institute of Aeronautics and Astronautics
- 2016-17 *Regional Director* Theta Tau Professional Engineering Fraternity (National Officer)
- 2015-16 *Regent (President)* Theta Tau Fraternity, Tau Beta (SMU) Chapter Officer
- 2014- *Member* Robert S. Hyer Society (SMU's Most Prestigious Honor Society)
- 2014- *Member* Phi Beta Kappa (The Nation's Oldest Academic Honor Society)
- 2014- *Member* Tau Beta Pi (The Engineering Honor Society)
- 2014- *Member* Pi Tau Sigma (The International Honor Society for Mechanical Engineers)
- 2012- *Student Member* American Society of Mechanical Engineers
- 2011- *Member* American Mensa, *The Largest and Oldest High IQ Society in the World*

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 Oxy-Acetylene), Building, Cooking, Baking, and Zymurgy