University of Colorado Boulder

Curriculum Vitae of
Benjamin J.A. Wise

Contact

(972) 249-7731

benjamin.wise@colorado.edu

career.bjawise.com

linkedin.com/in/benjamin-ja-wise

Address

6128 Graden Street,
Frederick, CO 80530

Benjamin J.A. Wise

Aerospace Engineering Sciences

Education

2018 - Present, University of Colorado at Boulder — **GPA: 3.871**
Ph.D. in Aerospace Engineering Sciences — **Advisor:** Jeffrey Thayer
Remote Sensing, Earth, and Space Sciences Specialization

2016 - 2018, Southern Methodist University — **GPA: 3.962**
M.S. in Mechanical Engineering — **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

Aug. 2018 - Present, *Doctoral Student*, *A*ctive *R*emote *SEN*sing *L*ab (ARSENL), CU Boulder

- Continued development of Data Acquisition Code for multi-channel TCSPC LIDAR systems.
- 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 equiptment 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, biocompatible 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 Fourguette, "A Microresonator Based Laser Velocity Sensor", *2018 AIAA Aerospace Sciences Meeting*, AIAA SciTech Forum, (AIAA2018-1770). DOI:10.2514/6.2018-1770

Poster Presentations

2018, *Poster Presentations*, Lyle School of Engineering Research Day Expo
DaSilva, J., **Wise, B.J.A.**, Salameh, E.R., and Ötügen , M.V. (2018). "Computational Design of Optical Micro-Seismometer." Lyle Research Day Expo.
Salameh, E.R., DaSilva, J., **Wise, B.J.A.**, and Ötügen , M.V. (2018). "Enhanced Scattering-Based Speed Sensor." Lyle Research Day Expo.

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*, SMU Research Day Expo
Wise, B.J.A., Eghbalifarkoosh, V., and Ötügen , M.V. (2017). "A Compact Atmospheric Entry Speed Sensor for Mars Missions." SMU Research Day. **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 and Analysis of Propulsion Systems		○ Intermediate Heat Transfer
Modeling and Controls:	○ Laboratory Physics	○ Circuit Analysis	○ Linear Systems Analysis
○ Design and Control of Mechanical Systems		○ Optimal and Robust Control	
○ Scientific High Performance Computing		○ Concepts of Experimental Physics	
Remote Sensing:	○ Radar & Remote Sensing	○ Random Processes	○ Engr. Data Analysis Methods

Honors and Awards

2019-20	*Smead Aerospace GAANN (Graduate Assistantships in Areas of National Need) Fellowship*, CU Boulder
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

2019-	*Student Member*	The Optical Society (OSA)
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