WILLIAM S. DANIELS

16291 W 56th Place, Golden, CO 80403 wdaniels@mymail.mines.edu
(206) 383-7619 www.linkedin.com/in/w-daniels/

EDUCATION

Colorado School of Mines B.S. May 2019
Major: Engineering Physics GPA 3.99
Minor: Computational and Applied Mathematics

INDUSTRY EXPERIENCE

Systems Engineering Intern **May 2018 - Aug 2018**
Northrop Grumman, Colorado Springs

- Worked with the Infrared Hardbody Signatures Team within the Threat Modeling Center (TMC).
- Investigated ways of decreasing simulation run time within the TMC's production process.
- Completed investigations into reflectance and false lines of sight, reducing run time by up to 80%.
- Wrote MATLAB scripts for parsing, plotting, and analysis of infrared signature data.
- Collaborated with other interns to implement a MATLAB and Unix based script that predicts the sunlit status of target objects.

RESEARCH EXPERIENCE

Verification of Elve Simulation using Data Set of Observed Elves **Aug 2018 - Present**
Colorado School of Mines, Department of Physics
Advisor: Lawrence Wiencke, PhD

- Used elves, a class of transient luminous events that occur in the ionosphere, to study lighting.
- Analyzed large elve datasets using ROOT, a data analysis framework written in C++.
- Determined the sensitivity of an elve simulation by mapping the input and output parameter spaces.
- Used this sensitivity study to simulate observed elves and analyze differences between simulation and data.
- Presented my work at the American Physical Society (APS) conference in April.

Implementation of Astrometry Based Laser System **Jan 2018 - Present**
Colorado School of Mines, Department of Physics
Advisor: Lawrence Wiencke, PhD

- Implementing a laser system that gives the pointing direction of a laser from a photo of the stars.
- Utilized Astrometry, a Unix based astrometric software that determines the equatorial coordinates of a picture of the stars.
- Created a coordinate conversion algorithm in MATLAB to convert from equatorial coordinates to horizontal coordinates centered on the laser system.
- Determined the relationship between azimuth angle and steps of a stepper motor.
- Currently designing a camera mount that provides five degrees of freedom for alignment.

Planned Laser Field Campaigns for EUSO Overflight **Oct 2016 - Jun 2017**
Colorado School of Mines, Department of Physics
Advisor: Lawrence Wiencke, PhD

- Planned laser field campaigns to test the Extreme Universe Space Observatory (EUSO), which was going to be sent to the ISS.
- Calculated the ground velocity of the ISS and used JSatTrack to plot ground tracks.
- Developed an orbital model for the ISS using Mathematica and JSatTrack that predicts the time and location of passes and takes into account the lunar cycle.

Characterization of Biorefinery Lignin **Jun 2016 - Aug 2016**
Washington State University, Voiland School of Bioengineering and Chemical Engineering
Advisor: Ruoshui Ma, PhD

- Summer Research Experience for Undergraduates (REU) at Washington State University.
- Studied the chemical conversion of lignins into aviation biofuel.
- Used thermal gravimetric analysis and Fourier-transform infrared spectroscopy to find differences in characteristics between lignin samples.
- Presented at poster symposium: "Characterization of Molecular Structure and Interlinkage Network for Seven Representative Biorefinery Lignin"

TEAM PROJECT EXPERIENCE

NASA DemoSat Program **Aug 2016 - Dec 2016**
Colorado School of Mines, Department of Physics

- Collaborated with team members to design and fabricate a device to test the radiation shielding capabilities of Martian basalt.
- Lead the CAD aspect of the team, used SolidWorks to create an accurate model of the prototype.
- Responsible for testing the Arduino sensor system, developed a freeze and shock test.

TEACHING EXPERIENCE

Assistant Chemistry Teacher **Aug 2017 - Dec 2017**
Arvada West High School
Mentor: Matthew Studenny

Modern Physics Teaching Assistant **Aug 2017 - Dec 2017**
Colorado School of Mines, Department of Physics
Professor: Fred Sarazin, PhD

ORGANIZATIONS AND PROFESSIONAL SOCIETIES

Physics	Society of Physics Students American Physical Society
Mathematics	Society for Industrial and Applied Mathematics
Engineering	American Institute of Aeronautics and Astronautics Tau Beta Pi Engineering Honor Society
Teaching	TEAM-UP Teaching Program

CONFERENCES AND POSTER SESSIONS

American Physical Society (APS) April Meeting **April 13-16**
Denver, Colorado

· Gave a talk in an undergraduate session.
· Talk title: "What can elves tell us about very strong lightning?"
· Received an outstanding presentation award for my talk.

Mines Physics Fest Poster Session **April 23**
Colorado School of Mines, Department of Physics

· Poster session for physics undergraduate and graduate students.
· Poster title: "What can elves tell us about very strong lightning?"
· Received first place award for my poster.

ACADEMIC ACHIEVEMENTS

Fellowships	Mines Undergraduate Research Fellowship Harvey Scholarship
Awards	General Chemistry Student of the Year Mines Physics Department Distinguished Graduate First Place Poster in Physics Department Research Poster Session

COMPUTING EXPERIENCE

Programming Languages	MATLAB, C++, ROOT, Mathematica, LaTeX
Operating Systems and Software	Linux, Windows, LabVIEW, JSatTrack, SolidWorks

RELEVANT COURSEWORK

Physics	PHGN 311: Introduction to Mathematical Physics PHGN 341: Thermal Physics (Statistical Mechanics) PHGN 350: Intermediate Mechanics (Classical Mechanics) PHGN 361: Intermediate Electromagnetism PHGN 462: Electromagnetic Waves and Optics
Mathematics	MATH 307: Introduction to Scientific Computing MATH 332: Linear Algebra MATH 455: Partial Differential Equations MATH 510: Ordinary Differential Equations and Dynamical Systems
Engineering	CBEN 210: Introduction to Thermodynamics EPIC 251: Planetary Engineering Design CSCI 261: Programming Concepts EGGN 408: Introduction to Space Exploration