

# CONTACT



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721 N 1st Street Unit C DeKalb, IL 60115

# ACCOMPLISHMENTS

#### Co-author of ASME Publication (2017)

Performance of Supercharged Engine Fueled with CTI Binary Mixture at Different Injection Pressures

#### Walter S. Haven Physics Prize (2017)

Awarded to students in physics who complete outstanding research projects. Granted specifically in honor of excellent work with the Physics Department's accelerator.

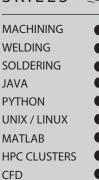
**Departmental Honors** (awarded May 2017)

Phi Beta Kappa Member (inducted May 2017)

Presidential Scholarship (2014-2017)

Beloit College's prestigious honor awarded for exceptional academic achievement.

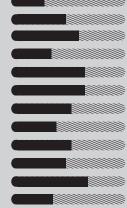
# SKILLS



LabVIEW

TCL LAMMPS

SOL



# Mary Elizabeth Breen-Lyles

ENGINEER - RESEARCHER - PROGRAMMER

# SUMMARY

Fast-learning, critically-thinking, conscientious worker with substantial design and programming experience from a wide breadth of engineering and research applications. Maintains strong mathematical aptitude and a passion for problem-solving. Fantastic communicator and tenacious team member with an appetite for learning and enthusiasm for achieving project goals.

# EDUCATION 🖹

# M.S. Mechanical Engineering, Northern Illinois University (August 2019) - GPA: 3.9

- ► Certificate of Graduate Study: Thermal, Fluid, and Energy Systems
- ► Thesis Title: Direct Polymer Grafting as a Method of Preserving the Mechanical Properties of Cellulose Nanocrystals in the Presence of Moisture
- ► Took courses in CFD simulation, and thermodynamic systems

**B.S. Physics,** Beloit College (May 2017) - GPA: 3.9

# WORK EXPERIENCE

# 2018

# **Graduate Research Assistant,** Northern Illinois University DeKalb, IL (January 2018 - present)

- ► Designed and executed molecular simulations across distributed systems to demonstrate the effectiveness of polymer grafting at enhancing mechanical properties of a cellulose nanofiller
- ► Conducted a literature review of CNC use in materials, accompanied by comprehensive computational materials design and programming.
- ► Use of VMD, LAMMPS, OVITO, NAMD, and Tcl/Python3 and Excel for data analysis and acquisition.

# 2017

# Research Assistant, Beloit College

Beloit, WI (August 2016 - May 2017)

- Repaired handmade proton accelerator via machining and configurational planning for new/existing instrumentation
- ► Designed and wired a new power supply switching system for the accelerator and machined a box to house it
- Worked extensively on the electromagnet including the cooling system, Faraday cup implementation, electrical load and bending angle calculations
- ► Tuned magnet based on initial predictions and later testing. Used MATLAB, thermal imaging, and thermocouple, voltmeter, ammeter data for analysis

# 2016

# **Undergraduate Research Fellow,** Georgia Southern University Statesboro, GA (June 2016 - August 2016)

Statesboro, GA (June 2016 - August 2016)

- Developed LabVIEW programs for pressure transducers, accelerometers, and flow meters on a jet turbine and diesel engine to transfer, process, and analyze the engine data
- Machined and/or welded new pieces for a diesel engine to help with safety or to aid in data acquisition
- ► Designed, machined, and soldered new signal amplifier for a pressure transducer
- Gained substantial experience in sensor calibration, instrumentation, advanced data acquisition, programming, and machining

# 2015

# Sustainability Fellow, Beloit College

Beloit, WI (September 2015 - May 2016)

- ► Wrote program to compute thermodynamic properties of new campus building
- ► Developed in-depth model using thermal FEA to predict HVAC needs
- ► Presented at 2016 Student Symposium and to Beloit College Board of Trustees