Tom Eichlersmith

email: eichl008@umn.edu

Education

University of Minnesota, Minneapolis, MN (June 2018 - Present)
Doctoral Student in Physics, Advisor: Professor Jeremiah Mans
Hamline University, Saint Paul, MN (September 2014 - May 2018)
Bachelor of Science, Physics and Mathematics

Honors and Awards

- Certificate for Outstanding Teaching and Dedication to Helping Students Learn (May 2019)
- Alumni Award in Physics (May 2018)
- Jonathan Sautner Memorial Award (May 2018)
- Outstanding Senior Mathematics Award (May 2018)
- Lund Speaking Competition First Place Award (May 2018)
- Chosen to represent Hamline Physics at the Nobel Prize Inspiration Initiative (April 2018)
- Outstanding Junior Mathematics Achievement (May 2017)
- Alumni Award in Physics (May 2017)
- Hamline Circle of Omicron Delta Kappa Student Leader of the Year (February 2017)
- Howard Hughes Medical Institute Summer Research Fellowship (May 2016 - August 2016)
- Fulford-Karp Family Scholarship (May 2015 - May 2018)
- Jerry L. Artz Memorial Scholarship (May 2014 - May 2018)
- Presidential Scholarship (September 2014 - May 2018)

Scholarly Memberships

- Hamline University Circle of Phi Beta Kappa (April 2017 - Present)
- Hamline University Circle of Omicron Delta Kappa (November 2016 - Present)
- Hamline Chapter of Society of Physics Students (September 2016 - May 2018)
- Hamline University Honors Program (September 2015 - May 2018)

Skills and Methodologies

Highly proficient in managing group work and documentation of coding libraries
Fluent with programming in C++, ROOT, python, cmake, bash, and Mathematica
Familiar with programing in googlescript and data collection using an Arduino

Research Experience

University of Minnesota, Minneapolis, Minnesota
(June, 2018 - Present)

- Framework development for the Light Dark Matter eXperiment including implementation of a unit testing package (Catch2) and creation of a custum ubuntu image to make starting on LDMX easier
- Construction of a tracking algorithm in order to identify specific types of events

Hamline University, Saint Paul, Minnesota
(September, 2017 - May, 2018)

- Numerically and analytically investigating random walks on various simple two-dimensional manifolds

- Optimizing programs in Mathematica to perform these random walks and collect data on their outcomes
- Interpreting this data collection as a numerical solution to $\Delta u = -1$ on the chosen manifold

European Organization for Nuclear Research (CERN), Geneva, Switzerland
(June, 2017 - August, 2017)

- Analyzed forward proton trajectories for the ATLAS experiment
- Constructed a generalized package that performed routine analyses for the user given certain machine settings
- Interfaced with members of ATLAS Forward Proton team weekly to make the package most applicable to their work

Hamline University, Saint Paul, Minnesota
(June, 2016 - August, 2016)

- Investigated two-dimensional shapes to find a drum which produces harmonic frequencies
- Developed algorithms in Mathematica to search for optimal shapes acting as tonal drums

Hamline University, Saint Paul, Minnesota
(June, 2015 - August, 2015)

- Development of prototype renewable energy sources
- Created a prototype for piezoelectric energy harvesting from foot steps

Publications

- Åkesson, T., Blinov, N., Bryngemark, L. et al. A high efficiency photon veto for the Light Dark Matter eXperiment. J. High Energ. Phys. 2020, 3 (2020). https://doi.org/10.1007/JHEP04(2020)003

Presentations

- "The Light Dark Matter eXperiment and Its Backgrounds " Poster presentation at the University of Minnesota Prospective Student Weekend. February, 2020.
- "CMS and the LHC. " Oral presentation at the University of Minnesota QuarkNet Conference. June, 2019.
- "The Search for Harmonic Drums." Oral presentation at the National Conference for Undergraduate Research, Memphis, Tennessee. April, 2017.
- "Computational Search for a Drum that Produces Harmonics." Poster presentation at the Hamline University Summer Research Symposium, Saint Paul, Minnesota. September 2016.
- "Prototype Application for Piezoelectric Energy Harvesting." Poster presentation at the Hamline University Summer Research Symposium, Saint Paul, Minnesota. September 2015.

Related Experience

Mentor Physics Teaching Assistant (TA), University of Minnesota, Minneapolis, Minnesota
(June, 2019 - Present)

- Construct and run a year-long curriculum for enhancing incoming physics TAs instruction abilities
- Track progress of new TAs to help identify necessary areas of improvement

Physics TA, University of Minnesota, Minneapolis, Minnesota
(September, 2018 - Present)

- Test, organize, and facilitate group problem-solving and experimental practice sessions
- Evaluate students' learning goals through assignment and grading of written lab reports

Academic Support Tutor, Hamline University, Saint Paul, Minnesota
(September, 2015 - May, 2018)

- Explain and instruct fellow students in complicated concepts from the Physics, Mathematics, and Computer Science curricula
- Work through complicated problems with students to teach them problem-solving skills

Co-curricular Experience

- **Business Manager**, Hamline University Programming Board, Saint Paul, Minnesota
  March 2017 - May 2018
- **Treasurer**, Hamline University Circle of Omicron Delta Kappa, Saint Paul, Minnesota
  January 2017 - May 2018
- **Station Manager**, Hamline University Radio Station, Saint Paul, Minnesota
  November 2015 - May 2018
- **Lead Organizing Officer**, Winter Wonder Jam Planning Committee, Saint Paul, Minnesota
  October 2015 - May 2018