Daniel Robert McCusker

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Applied Physics Graduate Program
University of Michigan, Ann Arbor
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Education

2023 Ph.D. Applied Physics, University of Michigan, Ann Arbor
Thesis research: stochastic modeling of biological growth and development, analysis of experimental data. Supervisor: David K. Lubensky

2018 M.Sc. Applied Physics, Delft University of Technology, *cum laude*.
Fulbright Scholarship, awarded by the U.S. Department of State and the TU Delft Faculty of Applied Sciences.
Thesis research: jamming dynamics of soft active particles. C++ molecular dynamics simulations and visualization, statistical mechanics and jamming transition in active matter. Supervisor: Timon Idema

2016 B.S. Physics, Georgetown University, *magna cum laude* and with departmental honors.
John Carroll Fellowship, "Georgetown's flagship opportunity for its most academically talented and ambitious undergraduates," offered to 2% of each graduating class.

Employment

2018 *Development Intern*, Sobolt
Sobolt is a Dutch tech startup in the renewable energy and sustainability sector. Implemented SOTA semi-supervised and unsupervised algorithms for object classification in remote sensing data.

Publications

2022 *Fundamental physical limits on size precision in growing organs and cells*, in preparation. Presentation at American Physical Society March Meeting Conference 2022.

2019 *Active particle dynamics beyond the jamming density*, EPL **125** 36001

Other Research Experience

2016 European Organization for Nuclear Research (CERN): Dark matter phenomenology, simulation of Higgs boson production channels and invisible particle decays. Visualization of experimental constraints to guide dark matter searches at CMS.
Supervisor: Dr. Tristan du Pree, Nikhef/CERN

Other Relevant Experience

- Climate Hack AI finalist
  - ◇ In order to predict cloud cover, built and trained a Wasserstein auto-encoder network and a linear dynamical model. Competed on-site in the final round at Harvard University, representing the University of Michigan Data Science Team.
- Electrical Engineering and Computer Science 598: Advanced Graph Mining
  - ◇ Term project: Higher-order (non-Markovian) community detection in American air travel data

Skills

Python, C++, Mathematica, pandas, numpy, scipy, Jupyter