

# Daniel Robert McCusker

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Applied Physics Graduate Program  
University of Michigan, Ann Arbor  
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## EDUCATION

- 04/23      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 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, Monte Carlo simulations of Higgs production channels and invisible particle decays using MadGraph and MadDM software. Python/ROOT visualizations of cosmological and direct detection constraints from LUX and Planck experiments to guide dark matter searches at CMS.  
Supervisor: Dr. Tristan du Pree, [Nikhef](#)/CERN

## OTHER RELEVANT COURSEWORK

- Electrical Engineering and Computer Science 598: Advanced Graph Mining
  - ◊ Term project: Higher-order (non-Markovian) community detection in American air travel data

## SKILLS

*Regularly use:* Python, pandas, numpy, scipy, Jupyter, Mathematica  
*Have used in past projects:* C++, R, TensorFlow, scikit-learn, SQL

## EXTRACURRICULARS AND INTERESTS

- 2022      *University of Michigan Data Science Team*
- 2015–2016      *Georgetown Cabaret*, General Manager. Produced the 39<sup>th</sup> and 40<sup>th</sup> annual rock concerts, with combined ticket sales of nine hundred. Arranged songs, led rehearsals, and played lead guitar.