Christopher J. Miles

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Education

- **Massachusetts Institute of Technology** — Cambridge, MA
  Batchelor of Science in Physics with a minor in Mechanical Engineering — *Sept. 2006 – June. 2010*
- **University of Michigan** — Ann Arbor, MI
  Masters of Science in Applied and Interdisciplinary Mathematics — *Sept. 2012 – Dec 2014*
- **University of Michigan** — Ann Arbor, MI
  Ph.D. Candidate in Physics — *Sept. 2012 – Present*

Highlighted Graduate Coursework: Machine Learning, Computer Modeling in Complex Systems, Numerical Methods for Differential Equations, Numerical Linear Algebra, Stochastic Processes, Dynamical Systems and Chaos, Functional Analysis, Complex Analysis, Asymptotic Analysis, Statistical Mechanics, Complex Adaptive Systems, Fractals and Percolation, Mathematical Fluid Mechanics, Quantum Field Theory, Measure Theory, Quantum Mechanics I/II, Electromagnetism

Academic Research Experience

- **MIT: Coolant system design for superconducting power transmission** — Cambridge, MA
  Undergraduate Researcher — *Spring and Summer 2008*
- **University of Michigan: Nucleation in acoustic droplet vaporization** — Ann Arbor, MI
  Graduate Student Research Assistant — *Spring 2013-July 2016*
- **Woods Hole Oceanographic Institution: Invasion of active matter into a fluid** — Woods Hole, MA
  Research Fellow — *Summer 2016*
- **University of Michigan: Optimal control of fluid mixing** — Ann Arbor, MI
  Graduate Student Research Assistant — *Spring 2013 – Present*

Industry Research Experience

- **General Atomics: Plasma Fusion Group** — San Diego, CA
  Experimental Research Intern — *Summer 2009*
- **Continental Tires R&D: Pattern, Contour, and Layout** — Hanover, Germany
  Mechanical Engineering Intern — *Fall 2010 – Winter 2011*
- **On-Ramp Wireless: Communications Physical Layer** — San Diego, CA
  Systems Engineering Intern — *Summer 2011-Fall 2011*

Data Science and Machine Learning Experience

- **Michigan Datathon hosted by Citadel and Correlation One** — Ann Arbor, MI
  Participant — *November 2017*
  - Chosen to participate based on selective assessment test.
  - Competed with a four-person team against 22 other teams in an intensive seven-hour competition.
- **Santa Fe Institute's Complexity Challenge**
  Participant — *September 2017*
  - Used a multi-agent reinforcement learning approach to address the research challenge problem.

University Service

- **Complex Systems Advanced Academic Workshop** — Ann Arbor, MI
  Co-organizer — *2015-2017*
  - Organize biweekly meetings for graduate student talks, journal discussions, and tutorials
  - Organized Introduction to Agent-Based Modeling short course taught by Bill Rand (July 2015)
  - Organized Complex Systems Research Hackathon (September 2016)
  - Organized Evolutionary Game Theory short course (July 2017)

- **Introduction to Mechanics: Lab. Course** — Ann Arbor, MI
  Graduate Student Instructor — *Fall 2013-Fall 2014*
- **Electromagnetism II** — Ann Arbor, MI
  Graduate Student Instructor — *Spring 2015*
- **Evolutionary Game Theory** — Ann Arbor, MI
  Graduate Student Instructor — *Fall 2016*
- **Electromagnetism (Honors)** — Ann Arbor, MI
  Graduate Student Instructor — *Winter 2017*
- **Theory of Complex Systems** — Ann Arbor, MI
  Graduate Student Instructor — *Fall 2017*
- **Nonlinear Dynamics and Chaos** — Ann Arbor, MI
  Graduate Student Instructor — *Fall 2017*

Awards and Fellowships

- National Undergraduate Fellowship in Plasma Science and Fusion Technology — Summer 2009
- University of Michigan's Rackham Merit Fellowship — June 2012-Present
- Woods Hole Oceanographic Institute's Geophysical Fluid Dynamics Fellowship — Summer 2016

Computer and Programming Skills

- **Programming**: Experience in Python, Javascript, and Matlab.
- **Version control**: Experience with Git, Mecurial, Github, and Bitbucket.

Workshops and Conferences

- Control theory short course — Minneapolis, MN, June 2014
- Turbulent transport and mixing workshop - IPAM, UCLA — Los Angeles, CA, October 2014
- APS Meeting Division of Fluid Dynamics — Boston, MA, November 2015
- Extreme events and criticality in fluid mechanics — Toronto, ON, January 2016
- Challenges in non-equilibrium statistical physics and fluid dynamics — Provo, UT, May 2016
- Genetic programming: theory and practice — Ann Arbor, MI, May 2016
- APS Meeting Division of Fluid Dynamics — Portland, OR, November 2016
- Turbulent dissipation, mixing, and predictability workshop — Los Angeles, CA, January 2017
- Santa Fe Institute's Complex Systems Summer School — Santa Fe, NM, June 2017
- APS Meeting Division of Fluid Dynamics — Devner, CO, November 2017

Presentations

- Optimal fluid mixing — Ann Arbor, MI, 2014
- Optimization tutorial and fluid mixing — Ann Arbor, MI, 2015
- A shell model for optimal fluid mixing — Ann Arbor, MI, 2015
- Optimal control of a shell model for mixing — Boston, MA, 2015
- A shell model for optimal fluid mixing — Ann Arbor, MI, 2015
- Clusters, confinement, and collisions in active soft matter — Ann Arbor, MI, 2016
- Nucleation pressure threshold in acoustic droplet vaporization — Portland, OR, November 2016
- Unstable self-stretching and stealth invasion of active matter into a fluid — Denver, CO, November 2017

Publications

- L. Bromberg, P. C. Michael, J. V. Minervini, **C. J. Miles**, Current lead optimization of cryogenic operation at intermediate temperature in Transactions of the cryogenic engineering conference, AIP Conference Proceedings 1218, 577, 2010
- L. Bromberg, P. C. Michael, J. V. Minervini, **C. J. Miles**, Coolant topology options for high temperature superconducting transmission and distribution systems, in Transactions of the cryogenic engineering conference, AIP Conference Proceedings 1218, 871, 2010
- **C. J. Miles**, C. R. Doering, O. D. Kripfgans, Nucleation pressure threshold in acoustic droplet vaporization, Journal of Applied Physics 120, 034903, 2016
- **C. J. Miles**, C. R. Doering, A shell model for optimal mixing, Journal of Nonlinear Science, 2017
- **C. J. Miles**, C. R. Doering, Diffusion-limited mixing by incompressible flows, (submitted)
- **C. J. Miles**, Michael J. Shelley, and Saverio E. Spagnolie, Unstable self-stretching and stealth invasion of active matter into a viscous fluid, (to appear in WHOI GFD 2016 proceedings and in preparation for journal submission)