CHRISTOPHER J. MILES

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EDUCATION

Massachusetts Institute of Technology — Cambridge, MA
Bachelor of Science in Physics with a minor in Mechanical Engineering — Sept 2006 - June 2010

University of Michigan — Ann Arbor, MI
Ph.D. Candidate in Physics — Sept. 2012 – Present
Masters in Applied and Interdisciplinary Mathematics — Sept. 2012 – December 2014
Graduate Certificate in Complex Systems — Jan 2016 – Present

Advisor: Charles Doering (Prof. of Complex Systems, Mathematics, and Physics)

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

Mass Open Online Course:
Introduction to Complexity – Santa Fe Institute (earned certificate of completion) — Summer 2015

ACADEMIC RESEARCH EXPERIENCE

MIT Plasma Science and Fusion Center — Cambridge, MA
Undergraduate Researcher — Spring, Summer 2008

General Atomics – Fusion Group — San Diego, CA
Princeton Plasma Physics Laboratory's National Undergraduate Fellowship in Plasma Fusion — Summer 2009
Experimental Research Intern

Agent-based coevolution model — Ann Arbor, MI
Graduate Student Research Assistant — Summer-Fall 2012
Principal Investigator: Robert Savit (Physics)

Nucleation in acoustic droplet vaporization — Ann Arbor, MI
Graduate Student Research Assistant — Spring 2013-July 2016
Principal Investigators: Charles Doering, Oliver Kripfgans (Radiology)

Clusters, confinement, and collisions in active soft matter — Woods Hole, MA
Woods Hole Oceanographic Institution – Geophysical Fluid Dynamics Summer Program — Summer 2016
Research Fellow
Principal Investigators: Michael J. Shelley (NYU, Courant) and Saverio E. Spagnolie (UW-Madison)

Optimal control of fluid mixing (Thesis Project) — Ann Arbor, MI
Graduate Student Research Assistant — Summer 2013-Present
Principal Investigators: Charles Doering

INDUSTRY RESEARCH EXPERIENCE

Continental Tires R&D – Pattern, Contour, and Layout — Hanover, Germany
Mechanical Engineer / Intern — Fall 2010 – Winter 2011

On-Ramp Wireless — San Diego, CA
Communications Physical Layer Systems Engineer / Intern — Summer 2011-Fall 2011

UNIVERSITY SERVICE

Complex Systems Advanced Academic Workshop – Co-organizer — 2015-2017
Faculty Advisor: Rick Riolo

- 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)

TEACHING AND GRADING EXPERIENCE

Introduction to Mechanics: Lab. Course - *Graduate Student Instructor* — Ann Arbor, MI Fall 2013-Fall 2014
Electromagnetism II - *Grader* — Ann Arbor, MI, Spring 2015
Evolutionary Game Theory - *Grader* — Ann Arbor, MI, Fall 2016
Electromagnetism (Honors) – *Graduate Student Instructor* — Ann Arbor, MI, Winter 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

WORKSHOPS AND CONFERENCES

Control theory short course – University of Minnesota, Twin Cities — Minneapolis, MN
Hosted by Institute for Mathematics and its Applications (IMA) — June 2014

Turbulent transport and mixing workshop - UCLA — Los Angeles, CA
Hosted by Institute of Pure and Applied Mathematics (IPAM) — October 2014

APS Meeting – Division of Fluid Dynamics — Boston, MA
Hynes Convention Center — November 2015

Extreme events and criticality in fluid mechanics: computations and analysis — Toronto, ON
Hosted by The Fields Institute at the University of Toronto — January 2016

Challenges in non-equilibrium statistical physics and fluid dynamics — Provo, UT
Hosted by Brigham Young University — May 2016

Genetic programming: theory and practice — Ann Arbor, MI
Hosted by Center for the Study of Complex Systems at U. of Michigan — May 2016

APS Meeting – Division of Fluid Dynamics — Portland, OR
Oregon Convention Center — November 2016

Turbulent dissipation, mixing, and predictability workshop - UCLA — Los Angeles, CA
Hosted by Institute of Pure and Applied Mathematics (IPAM) — Jan 2017

PRESENTATIONS

Optimal fluid mixing (Complex Systems Adv. Academic Workshop (CSAAW), Ann Arbor, MI) — 2014
Optimization tutorial and fluid mixing (CSAAW, Ann Arbor, MI) — 2015
Optimization tutorial and fluid mixing (CSAAW, Ann Arbor, MI) — 2015
A shell model for optimal fluid mixing (Applied Math Student Seminar, Ann Arbor, MI) — 2015

Optimal control of a shell model for mixing (APS Meeting – Division of Fluid Dynamics, Boston, MA) 2015
A shell model for optimal fluid mixing (IOE Student Seminar, Ann Arbor, MI) 2015
Clusters, confinement, and collisions in active soft matter (CSAAW, Ann Arbor, MI) 2016
Clusters, confinement, and collisions in active soft matter (Applied Math Student Seminar, Ann Arbor, MI) 2016
Nucleation pressure threshold in acoustic droplet vaporization (APS–Div. of Fluid Dynamics, Portland, OR) 2016

PUBLICATIONS

1. Current lead optimization of cryogenic operation at intermediate temperature, L. Bromberg, P. C. Michael, J. V. Minervini, C. J. Miles, in *Transactions of the cryogenic engineering conference,* AIP Conference Proceedings **1218**, 577 (2010)

2. Coolant topology options for high temperature superconducting transmission and distribution systems, L. Bromberg, P. C. Michael, J. V. Minervini, C. J. Miles, in *Transactions of the cryogenic engineering conference,* AIP Conference Proceedings **1218**, 871 (2010)

3. Nucleation pressure threshold in acoustic droplet vaporization, C. J. Miles, C. R. Doering, O. D. Kripfgans, *Journal of Applied Physics* **120**, 034903 (2016)

4. A shell model for optimal fluid mixing, C. J. Miles, C. R. Doering, submitted to *Journal of Nonlinear Science* (2016)

5. Spreading, instability, and self-organized propulsion of active matter clusters, C. J. Miles, Michael J. Shelley, and Saverio E. Spagnolie. To appear in *WHOI GFD 2017 Proceedings* and in preparation for submission to *Soft Matter*