

# JASON M LARKIN

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## CAREER OVERVIEW AND OBJECTIVE

I have extensive experience performing experimental and numerical studies in condensed matter physics with an emphasis on nanoscale transport, fluid dynamics, and nonlinear analysis. My interests include atomistic and multi-scale modeling, multi-language development for applications in high-performance parallel computing, and open-source collaboration to improve the way research is performed and the way results are disseminated.

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## EDUCATION

**Carnegie Mellon University** Pittsburgh, PA • PhD Mechanical Engineering, 2013 GPA: 3.85/4.00

**Thesis: Thermal Modeling of Disordered Materials.** Numerically investigated thermal properties of crystal alloys, glasses, and organic materials using classical and *ab initio*-based atomistic techniques.

**Coursework:** molecular/electron structure · nanoscale transport phenomena · numerical methods

**University of Pittsburgh** Pittsburgh, PA • MS Mechanical Engineering, 2009 GPA: 3.70/4.00

**Thesis: Statistics of Particle Concentrations in Free-Surface Turbulence.** Performed experiments using novel 2D and 3D flow configurations to study turbulence as a nonlinear dynamical system.

**Coursework:** quantum and statistical physics · turbulence · chaos and nonlinear phenomena

**University of Pittsburgh** Pittsburgh, PA • BS Mechanical Engineering, 2007 GPA: 3.20/4.00

**Research:** Used Finite Element Analysis to design a model arterial bifurcation for *in vivo* study.

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## EXPERIENCE

**Carnegie Mellon University** (2010-2012) Teaching Assistant-Heat Transfer

- Topics in conduction, convection, and radiation. Supervised recitations and substituted for lectures.

**University of Pittsburgh** (2008) Teaching Assistant-Advanced Fluid Mechanics

- Topics in viscous flow, boundary layer theory, and scale similarity.

**University of Pittsburgh** (2007-2009) Lecturer-Physics

- Lectured to students and faculty on mathematics, bio-physics, turbulence, statistical and nonlinear phenomena.

**Precision Therapeutics** (2006-2007) Intern-Technology Development

- Worked with team of software developers and laboratory equipment specialists.
- Used CADD to design and fabricate components of optical microscopes and laboratory automation controls.

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## SKILLS

- **Computing Languages:** Matlab, Fortran, Python, C/C++, Java,  $\text{\LaTeX}$ , Shell, Perl, Markdown, HTML.
- **High-Performance Computing:** linux/unix cluster administration/computing, parallel computation (MPI, OpenMP), mixed-language development, open-source development (Git, Github, arXiv).
- **General Computing:** Linux/Unix, Mac OS, Windows, Microsoft Office.
- **Modeling:** atomistic simulation, quantum chemistry, nanoscale transport, statistical and nonlinear analysis.
- **Hardware:** general computing, optics/lasers, DI/DO AI/AO interfaces, simple automation, machining, circuitry.

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## PROJECTS

- **Quantum Mechanics-Driven Prediction of Nanostructure Thermal Conductivity:** served as investigator under the AFOSR with collaborators at Carnegie Mellon and Univ. of Pitt., performing calculations on the DOD's HPCMP.
- **disorder:** a comprehensive repository of open-source code and data from my PhD thesis, hosted on Github.
- **ntpy:** created this open-source collaborative effort between members of NTPL and University of Toronto.
- **GULP:** international collaboration with Julian Gale at the Nanochemistry Research Institute at Curtin University.
- **Statistics of Free-Surface Turbulence:** international collaboration with Alain Pumir at ENS Lyon, France.

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## PUBLICATIONS (SELECTED, 11 TOTAL)

- "Origin of the Exceptionally Low Thermal Conductivity of Fullerene Derivative PCBM Films", (in progress).
- "Decorrelating a Compressible Turbulent Flow: an Experiment", Phys. Rev. E 82, 016301 (2010).

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## PRESENTATIONS (SELECTED, 15 TOTAL)

- "Evaluation of the Virtual Crystal Approximation for Predicting Thermal Conductivity", J.M. Larkin (speaker), A.J.H. McGaughey, 2013 MRS Spring Meeting San Francisco, CA.
- "The Generalized Fractal Dimensions of a 2-D Compressible Turbulence", J. Larkin (speaker), M. Bandi, W. Goldberg, 2008 American Physical Society March Meeting New Orleans, LA.

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## HONORS

- 2012 ASME MHNMT International Summer Heat Transfer Conference Top 5 Technical Paper
- 2011 Bennett Conference Best Presentation
- 2011 ICES Northrop-Gruman Fellow
- 2007-2009 NSF Graduate Student Research Grant University of Pittsburgh Department of Physics.

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## MEMBERSHIPS

- American Physical Society · American Society of Mechanical Engineers · Materials Research Society · Society of Industrial and Applied Mathematics · DOD High Performance Computing Modernization Program