Daniel Tamor Liu Citron

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Education

Cornell University — Ithaca, NY

Ph.D. Theoretical Physics; Experimental Physics Minor — *2011 – Present*
M.S. Physics — *2014*
Committee: Christopher R. Myers, Chair; Paul Ginsparg; Paul McEuen

University of Chicago — Chicago, IL

B.A. Physics with Honors — *2005 – 2009*
Senior Honors Thesis: "Simulating Jamming in Granular Materials"

Awards & Fellowships

- NSF Graduate Research Fellowship (Cornell University) — *2012 – Present*
- Phi Beta Kappa (University of Chicago) — *2009*

Teaching Experience

Instructor — Cornell University

Physics GRE Preparation Short Course — *Spring 2013, 2014, 2015, 2016*
- Designed syllabus and lecture slides for 6-week course
- Gave lectures and led discussions to review undergraduate physics material for exam

Teaching Assistant — Cornell University

Electricity and Magnetism (honors sequence) — *Spring 2016*
Mechanics and Special Relativity (honors sequence) — *Fall 2015*
Physics II: Electricity and Magnetism — *Spring 2012*
Physics I: Mechanics and Heat — *Fall 2011*
- Led biweekly discussion sections to review material and problem solving techniques
- Provided additional support and during weekly office hours
- Supervised 10–15 students' laboratory work
- Demonstrated experimental techniques necessary to complete laboratory procedure
- Wrote weekly quizzes; graded homework and exams

Education Coursework

An Introduction to Evidence-Based Undergraduate STEM Teaching — *Fall 2016*

CIRTL online course, administered through edX
- Participated in weekly Cornell campus discussion group
- Reviewed current research-supported trends in undergraduate STEM teaching
- Applied new knowledge of active learning to develop an annotated example lesson plan

Teaching in Higher Education — Cornell University, *Spring 2016*
- Developed a syllabus and example lesson plan for introductory physics courses
- Presented on and demonstrated use of peer instruction and other active learning techniques

Research Interests

- Modeling infectious disease dynamics
- Stochastic processes
- Statistical physics
- Collaboration network assembly
- Social network analysis
- Data science

Data Science Projects

Network Assembly in Scientific Collaboration Networks Ithaca, NY

Graduate Research Assistant, Cornell University *Winter 2013– Present*

Complex Systems Summer School, Santa Fe Institute *Winter 2016*

- Created Python tools for studying development and growth of collaboration networks
- Used topic modeling software to detect subfields of articles in a large scientific corpus
- Measured and interpreted robust patterns in scientific collaboration network assembly
- Collaborated with interdisciplinary group to analyze dynamics of social networks

Measuring Patterns in Text Reuse in Scholarly Corpus Ithaca, NY

Graduate Research Assistant, Cornell University *Summer – Fall 2012*

- Measured rate and distribution of text reuse in online database of scientific articles (arXiv)
- Converted raw data into social network dataset for easy visualization and exploration
- Created Python tools for measuring properties of social network dataset

Modeling Projects

Contact Network Heterogeneity and Persistence of Disease Ithaca, NY

Graduate Research Assistant, Cornell University *Winter 2014 – Present*

- Derived and numerically solved equations describing disease model on annealed networks
- Utilized computer simulations to verify and augment the numerical results
- Explored how contact network heterogeneity increases disease persistence

Infectious Disease Dynamics Ithaca, NY

Graduate Research Assistant, Cornell University *Summer 2013 – Present*

- Programmed a variety of software tools for simulating disease dynamics in Python and Julia
- Performed mathematical analyses of stochastic models using moment closure techniques

Software and Hardware Development

Synchrotron X-Ray Tomography Experiment Argonne National Lab, Chicago IL

Research Support Staff, GSECARS *Spring 2010 – Summer 2011*

- Improved synchrotron X-ray tomography experiment at Advanced Photon Source
- Rewrote IDL software to allow for faster tomographic data collection
- Redesigned user interface for controlling tomography experiment
- Designed and built optical mount for new tomography experiment apparatus

Software Testing of Implantable Medical Device Yehud, Israel

Biomedical Engineering Intern, Biocontrol Medical *Fall 2009 – Spring 2010*

- Designed firmware test protocol for electronic wand used to communicate with the device
- Performed tests on software for programming the device

Publications

- Daniel T. Citron, Paul Ginsparg. "Patterns of Text Reuse in a Scientific Corpus." PNAS 2014; published ahead of print December 8, 2014, DOI:10.1073/pnas.1415135111
- Mark L. Rivers, Daniel T. Citron, Yanbin Wang. "Recent Developments in Computed Tomography at GSECARS," Proc. SPIE 7804, 780409 (2010), DOI:10.1117/12.861393
- X. Cheng, G. Varas, D. Citron, H. Jaeger, and S. Nagel. "Collective Behavior in a Granular Jet: Emergence of a Liquid with Zero Surface Tension," Physical Review Letters, Vol. 99, Nov. 2007

Conferences and Workshops

Network Assembly in Scientific Collaboration Networks Northwestern U.
International Conference on Computational Social Science June, 2016

Network Analysis of ArXiv Santa Fe Institute
SFI Complex Systems Summer School 2015 June, 2015

Moment Closure Analysis of SIRS Disease Model on Heterogeneous Networks
APS March Meeting 2015 March, 2015

Accounting for Fluctuations in Stochastic SIRS Model on Networks U. of Pittsburgh
International Workshop on Advances in Discrete Networks December, 2014

Undergradaute Research

Two-Dimensional Jamming Transition Chicago, IL
Undergraduate Research Assistant, University of Chicago *Fall 2008 – Fall 2009*

- Developed computer simulation in Fortran to explore jamming transition in soft discs
- Studied behavior of system's displacement field above and below jamming
- Collaborated with an experimentalist to compare simulation results to real-world phenomena

Simulating Role of Friction in Granular Physics Santiago, Chile
Undergraduate Research Assistant Universidad de Chile *Summer 2008*

- Utilized molecular dynamics software to simulate a shaken quasi-2D granular system
- Performed mathematical analysis of simulation outputs to calculate structure factor
- Investigated the role of friction in creating/destroying long-range order

Numerical Modeling of Cell Division Chicago, IL
University of Chicago Physics REU *Summer 2007*

- Modeled cell division as a viscous fluid drop pinching off
- Numerically solved differential equations of fluid motion in mathematica

Measurements of Granular Jet Behavior Chicago, IL
University of Chicago Physics REU *Summer 2006*

- Studied the rebound behavior of a granular jet striking a target at high velocity
- Collected and analyzed experimental data using high-speed video camera
- Empirically compared the granular jet's behavior to a fluid with zero surface tension

Service

Destination Imagination Central New York

Board Member and Volunteer *Spring 2015 – Present*

- Organized and supervised two large events with 50-100 K12 students
- Supervised educational team-building exercises with groups of 5-10 K12 students

Cornell Center for Materials Research Outreach Cornell University

Volunteer *Summer 2014 – Present*

- Conducted science outreach with 10-30 elementary school students
- Performed physics and chemistry demonstrations and explained basic scientific concepts
- Supervised small groups of 2-3 students to help them conduct simple experiments

Graduate & Professional Students Assembly Cornell University

Chair, Faculty Awards Committee *Fall 2014 – Fall 2015*

Physics Field Representative *Fall 2013 – Spring 2016*

- Attended biweekly meetings to discuss issues and initiatives relevant to graduate students
- Communicated with peers in physics department about events and other GPSA activities
- Planned faculty awards ceremony with small group of graduate student peers

Physics Graduate Society Cornell University

Treasurer, Event Coordinator *Summer 2012 – Spring 2013*

- Organized STEM graduate student summer colloquium series
- Worked with other officers to plan social events for graduate students throughout school year
- Conducted science outreach activities with community elementary school students and parents

University of Chicago Scavenger Hunt University of Chicago

Judge (event organizer) *2009 – 2014*

- Collaborated closely with group of 15-20 individuals to plan four day University-wide event
- Organized successful Guinness World Record as World's Largest Scavenger Hunt in 2011

Technical Skills

Proficient in:	Python, Mathematica, SQL, Fortran, HTML, Unix, LaTeX
Working knowledge of:	Git, Julia, Matlab, Octave, Adobe Lucene, IDL