

Steve Kuei

Ph.D Candidate, Chemical and Biomolecular Engineering, Rice University

about

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programming

MATLAB, Mathematica
FORTRAN, Java, C++

instruments

AFM
confocal microscopy
TIRF microscopy

interests

colloidal physics, single fiber dynamics and topology, fluid mechanics, Brownian dynamics and hydrodynamics simulations

education

2013-present **Ph.D** candidate in Chemical and Biomolecular Engineering Rice University
GPA: 3.7
Selected coursework: Colloidal and Interfacial Phenomena, Biophysics, DNA Biotechnology and Modeling, Computational Fluid Dynamics, Rheology

2008–2012 **BSE** in Chemical Engineering Princeton University
Certificates: Engineering Physics, Materials Science
GPA: 3.3
Selected Coursework: ODEs, PDEs, Organic Chemistry, Physical Chemistry, Polymers, Quantum Mechanics, Quantum Theory, Lagrangian Mechanics, General Relativity, Biophysics

publications

Kuei, Steve, Agnieszka Słowicka, Maria Ekiel-Jezewska, Eligiusz Wajnryb, Howard Stone. Dynamics and Topology of Flexible Chains in Steady Shear Flows. *New J. of Physics*, **17** (2015), 053009. [doi:10.1088/1367-2630/17/5/053009](https://doi.org/10.1088/1367-2630/17/5/053009).
Highlighted in IOPselect, chosen by the Editors for a high degree of novelty and significant impact on future research.

Yu, Dezhi, Veronica Pessino, Steve Kuei, and Megan T. Valentine. Mechanical and Functional Properties of Epopthilone-Stabilized Microtubules. *Cytoskeleton*, **70** (2013), pp. 74-84. [doi:10.1002/cm.21091](https://doi.org/10.1002/cm.21091)

Valdman, David, Paul J. Atzberger, Dezhi Yu, Steve Kuei, and Megan T. Valentine. Spectral Analysis Methods for the Robust Measurement of the Flexural Rigidity of Biopolymers. *Biophysical Journal*, **102** (2012), pp. 1144-1153.
[doi:10.1016/j.bpj.2012.01.045](https://doi.org/10.1016/j.bpj.2012.01.045)

presentations

Poster: "Dynamics and Conformations of Rotating Semiflexible Particle Chains"

Steve Kuei, Sibani Lisa Biswal

Gordon Research Seminar & Conference on Colloidal, Macromolecular and Polyelectrolyte Solutions. Ventura, CA, Feb. 2016.

"Dynamics and Conformations of Semiflexible Particle Chains Driven By Rotating Magnetic Fields"

Steve Kuei, Sibani Lisa Biswal

American Institute of Chemical Engineers Annual Meeting. Salt Lake City, UT, Nov. 2015.

"Conformations of semiflexible magnetic chains under rotating magnetic fields"

Steve Kuei, Sibani Lisa Biswal

ACS 89th Colloid & Surface Science Symposium. Pittsburgh, PA, June 2015.

"Using simple flows to tie knots in flexible fibers"

Steve Kuei, Chris Sadlej, Howard Stone

APS 65th Annual Division of Fluids Dynamics Meeting. San Diego, CA, November 2012.

research

- 2013-present **Soft Matter Laboratory** Biswal Group, Rice University
Magnetic fields are used to assemble linked colloidal chains, which are driven by rotating or oscillating external fields and flows. Chain dynamics are imaged and analyzed via confocal and light microscopy; observations and theory are augmented with Brownian Dynamics simulations.
- 2011-2013 **Complex Fluids Laboratory** Stone Group, Princeton University
Implemented HYDROMULTIPOLE algorithm to simulate single fiber dynamics in various simple flows. Resulting configurations were analyzed with particular emphasis on fiber orientation, shape, and topology.
- 06-12 2011 **Molecular and Cellular Biomechanics Laboratory** Valentine Group, UCSB
- 2010-2011 **Organic and Polymer Electronics Laboratory** Loo Group, Princeton University

awards

- 2015 **Riki Kobayashi Fellowship Award** Rice University
Presented for outstanding Ph.D Thesis Proposal entitled: "Dynamics of magnetically actuated colloidal particle chains". Awarded to one thesis proposal in the department per year, by the ChBE Graduate Studies Committee.
- 2013-2015 **Chemical Engineering Dept. Teaching Assistant Award** Rice University
Awarded to two Teaching Assistants every year, for dedication, patience, and knowledge of course material. Awarded three times, as chosen by the Junior Class in Fall 2015 (CHBE 401), the Junior Class in Fall 2014 (CHBE 401), and the Senior Class in Fall 2013 (CHBE 443).

leadership and activities

- 2016-2018 **Gordon Research Seminar: Colloidal, Macromolecular, and Polyelectrolyte Solutions** Co-Chair
In charge of organization, fundraising, and running of the 2018 Gordon Research Seminar, as well as inviting and organizing speakers from academia, national labs, and industry to present research and mentor students.
- 2015-present **Center for Teaching Excellence Graduate Advisory Board** Graduate Liason, ChBE
Department representative to the Center for Teaching Excellence Advisory Board, which seeks to further teaching excellence at Rice University, by providing workshops and opportunities to train in various classrooms skills, such as oration, curriculum design, etc.
- 2014-present **ChBE Graduate Student Association** Publicity Chair, Vice President
Planned and helped run academic and social events for the ChBE graduate students, such as barbeques, seminars, and receptions; in charge of all marketing and publicity, such as designing posters, t-shirts, and managing social media (publicity chair, 2014-2015). Also in charge of and co-organizer of the ChBE Graduate Mentor program, a new initiative wherein incoming students are paired with older mentors to help them acclimate to graduate life (Vice President, 2015-present).
- 2013-present **Funkonomics Crew** Artistic Director (2015-present)
Performing member, in bboy and hip-hop styles; in charge of coordinating, choreographing, and preparing guest performances with various groups around campus; choreographed and taught eight pieces for performances. In charge of teaching twice-weekly hip-hop classes, for which multiple pieces were choreographed or learned elsewhere.
- 2010-2011 **Intercollegiate Taiwanese American Student Association** Marketing Director
Member of executive board to plan and run 2011 East Coast ITASA conference with 400+ attendees; created promotional materials and conference materials for all attendees, and managed the event's website and social media outlets.