JINGHUI LIU

Department of Physics, MIT, Cambridge MA 02139
+1 6178931698 | e: jinghliu@mit.edu | web: https://jinghui-liu.github.io

EDUCATION

Massachusetts Institute of Technology — Cambridge MA, US
PhD Candidate, Department of Physics — 2016 – 2022 (Expected)
Peking University — Beijing, China
Bachelor of Science in Physics — 2012 – 2016

SELECTED AWARDS AND HONORS

- **Rising Star Award** in Soft and Biological Matter, UChicago Materials Research Center — Oct. 2020
- **Student Speaker Award Finalist**, GSNP (Topical Group on Statistical and Nonlinear Physics), APS — Mar. 2020
- Grand Poster Prize, MIT Biophysics Retreat — Oct. 2019
- **Morton E. Goulder Presidential Fellowship**, Department of Physics, MIT — 2016 – 2017
- Wusi Scholarship (Annual), Peking University — 2014 – 2015, 2015 – 2016
- Weiming Scholarship for Outstanding Undergraduate Research, Peking University — 2013 – 2014
- Ke-chi Shen Scholarship (Annual), Peking University — 2012 – 2013

PUBLICATIONS

- **Liu J**, Totz J F, Miller P W, Hastewell A D, Dunkel J, Fakhri N. Topological braiding and virtual particles on the cell membrane. In revision.
  Arxiv preprint (tbd)
- Wigbers M C*, Tan T H*, Brauns F, **Liu J**, Swartz S Z, Frey E, Fakhri N. (2021). A hierarchy of protein patterns robustly decodes cell shape information. Nature Physics, 1-7. [pdf]
  LMU News | PHYS.org
- Tan T H*, **Liu J***, Miller P W*, Tekant M, Dunkel J, Fakhri N. (2020). Topological turbulence on the membrane of a living cell. Nature Physics, 1-6. [pdf]
  Cover Article | Nature Research Highlights | Physics World Frontier | MIT News | PHYS.org
- Hoek T A, Axelrod K, Biancalani T, **Liu J**, Gore J. (2016). Resource availability modulates the cooperative and competitive nature of a microbial cross-feeding mutualism[J]. PLoS biology, 14(8). [pdf]

* Authors contribute equally to the publication

INVITED TALKS

2020 **UChicago Rising Stars in Soft and Biological Matter Symposium** — Virtual
2019 **Universality: Turbulence Across Vast Scales**, Flatiron Institute [video] — New York, NY
2019 **Gordon Research Seminar on Soft Condensed Matter Physics**, Colby-Sawyer College — New London, NH
2019 **Theory of Living Systems Meeting**, Boston University [video] — Boston, MA

CONTRIBUTED TALKS

2021 APS March Meeting (Virtual) — Virtual
2020 MIT Physics Departmental Special Tuesday Lunch Talk Series — Virtual
2020 APS March Meeting (Virtual) — Virtual
2019 APS March Meeting — Boston, MA
2018 Annual Biophysics Retreat, MIT — Provincetown, MA
2018 APS March Meeting — Los Angeles, CA
2015 Undergraduate Physics Research Seminar, Weiming Scholar Program, Peking University — Beijing, China

POSTERS

2019 Annual Biophysics Retreat, MIT — Provincetown, MA

2019 Gordon Research Conference on Soft Condensed Matter Physics, Colby-Sawyer College — New London, NH

2015 Annual Biophysics Retreat, MIT — Provincetown, MA

2014 – 2015 Annual Undergraduate Research Honor Program in Biology Retreat, Peking University — Beijing, China

TEACHING AND MENTORING

Graduate Mentor, Undergraduate Research Opportunities Program (MIT UROP)

Amel Elawad (May 2021 – present) | Ariana Park (Feb. 2020 – Sep. 2020)

Rotation Mentor, G1 Graduate Research Projects

Yu-Chen Chao (Harvard SEAS) | Hugh Higinbotham (MIT Physics) | Sebastian T. Coupe (MIT Biology)

Laboratory EHS representative — Dec. 2019 – present

Teaching Assistant, MIT course 8.13, "Junior Lab in Experimental Physics"

Feb. 2021 – May. 2021 — Cambridge, MA

Teaching Assistant, MIT course 8.241, "Introduction to Biological Physics"

Feb. 2020 – May. 2020 — Cambridge, MA

PROJECTS

MIT PLS Center, Fakhri Lab, Summer 2017 – present. Dissertation research on topological organization of protein signaling waves during starfish egg cell development. Wet-lab experiments and theory-driven analyses.

MIT IMES, Mirny Lab, Spring 2017 (rotation). Algorithm development and data analyses of lacunarity metric in yeast chromosome organization.

MIT PLS Center, Fakhri Lab, Winter 2016 (rotation). Numerical simulations and analyses of semiflexible polymer e.g. carbon nanotube motions when positioned under motor-like stochastic active forces.

Rice University, Visiting scholar, Fall 2015. Generalize NK model for microbial antibiotic resistance on the account of verified mutagenesis site statistics. *Selected by Peking University departmental exchange program and hosted by Bioscience Research Collaborative Center in Rice University.

MIT PLS Center, Gore Lab. Visiting Research Assistant, Summer 2015. Modeling multi-species bacterial communities with cross-feeding nutrients, in exploration of nutrient-constrained limits in terms of species diversity. *Supported by Undergraduate Research Honor Program in School of Biology, Peking University.

Peking University, Center of Quantitative Biology, Ouyang Group. Undergraduate Research Assistant, 2014 – 2016. Numerical work on cancerous epithelial-to-mesenchymal signaling networks. Bifurcation and parameter sensitivity analyses based on ODE models of network set up from available molecular evidences.

ACTIVITIES

Departmental **Advising Resources for Easing Friction and Stress** (REFS), MIT Physics
2019 – present — Cambridge, MA

Environmental Chair, Edgerton Graduate Housing Committee
2018 – 2019 — Cambridge, MA

Athletics Chair, Edgerton Graduate Housing Committee
2017 – 2018 — Cambridge, MA

Vice President, Science and Technology Leadership Association (STeLA), Peking University Branch
2014 – 2016 — Beijing, China

Academics and Performance Departmental Chair, Students' Union, School of Physics, Peking University
2013 – 2014 — Beijing, China

Volunteer Service Team Leader, School of Physics, Peking University

Jan. 2013 – Oct. 2013 (*Volunteer Service Award in Dec. 2013) — Beijing, China

ADDITIONAL INFORMATION

- **Language**: TOEFL 111 (Reading 30 + Listening 29 + Speaking 26 + Writing 26)
- **Programming**: C, Matlab, Mathematica, Python