

CURRICULUM VITAE: YUEXIA LUNA LIN

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EDUCATION AND RESEARCH EXPERIENCE

Paulson School of Engineering and Applied Sciences, Harvard University 2016 — Present

Ph. D. in Applied Mathematics, expected September 2021

Dissertation: *Computing nature: numerical methods and high performance simulations for fluid-structure interactions, bacterial competitions, and dissolution*

Advisor: Professor Chris Rycroft

Lawrence Berkeley National Laboratory Summer 2018, 2019

Research fellow at the Center for Computational Sciences and Engineering

Mentor: Dr. Ann Almgren

Lawrence Berkeley National Laboratory Summer 2015, 2016, 2017

Research student at Mathematics Group

Mentor: Professor Chris Rycroft

Barnard College, Columbia University 2011 — 2015

Bachelor of Arts in Physics, Summa Cum Laude

Advisor: Professor Timothy Halpin-Healy

CHESS, Wilson Synchrotron Laboratory, Cornell University Summer 2014

Research student

Mentor: Dr. Richard Gillilan

VERITAS, Nevis Laboratories, Columbia University Summer 2013

Research student

Mentor: Professor Reshmi Mukherjee

RESEARCH INTERESTS

Broadly: numerical methods in computational fluid dynamics, fluid-structure interaction; discrete and stochastic modeling of physical and biological systems: diffusion-limited dissolution and aggregation, competition and spatial structures in biofilm, high performance computing, scientific computing

JOURNAL PUBLICATIONS

Yuexia Lin, Nick Derr and Chris Rycroft, *Eulerian simulation of complex suspensions and biolocomotion in three dimensions*, in review. [arXiv:2104.00095](https://arxiv.org/abs/2104.00095), simulation codes *RMT3D* published on [GitHub](https://github.com).

Yuexia Lin, Stephanie Smith, Eva Kanso, Alecia Septer, and Chris Rycroft, *A subcellular biochemical model for T6SS dynamics reveals winning competitive strategies*, in preparation.

Yuexia Lin and Chris Rycroft, *Accurate discrete model of diffusion-limited dissolution*, in preparation.

Chenzheng Wang, Yuexia Lin, Devin Bougie, and Richard E. Gillilan, *Predicting data quality in biological X-ray solution scattering*, *Acta Cryst. D* **74**, 727-738 (2018).

Timothy Halpin-Healy and Yuexia Lin, *Universal aspects of curved, flat, and stationary-state Kardar-Parisi-Zhang statistics*, *Phys. Rev. E* **89**, 010103(R) (2014).

CONFERENCE PRESENTATIONS

Reference map technique: a fully Eulerian method for fluid-structure interactions, oral presentation at Computational Science Graduate Fellowship Annual Program Review via Zoom, July 13 - 15, 2020.

An agent-based model of cell growth and T6SS-dependent competition, poster presentation at Computational Science Graduate Fellowship Annual Program Review, Arlington, VA, July 15 - 18, 2019.

Reference map technique: a fully Eulerian method for fluid-structure interactions, poster presentation at Mathematical fluids, materials and Biology conference, Ann Arbor, MI, June 13 - 15, 2019.

Reference map technique: a fully Eulerian method for fluid-structure interactions, Women In Numerical Methods for PDEs and their Applications workshop, Banff International Research Station, Banff, Canada, May 12 - 17, 2019.

A numerical model of V. fischeri growth and intraspecific competition, APS March Meeting, Boston, MA, Mar. 4 - 8, 2019.

Reference map technique: a fully Eulerian method for fluid-structure interactions, contributed talk at SIAM CSE, Spokane, WA, Feb. 25 - Mar. 1, 2019.

Performance study on GPU offloading via CUDA, OpenACC, and OpenMP in AMReX, poster presentation at SIAM CSE, Spokane, WA, Feb. 25 - Mar. 1, 2019.

Reference map technique: a fully Eulerian method for fluid-structure interactions, poster presentation at Computational Science Graduate Fellowship Annual Program Review, Arlington, VA, July 16 - 19, 2018.

A numerical model of V. fischeri growth and intraspecific competition, 30th Annual *Euprymna scolopes-Vibrio fischeri* Symbiosis Symposium La Jolla, CA, June 14 - 17, 2018.

The reference map technique for simulating dense suspensions of flexible particles, APS March Meeting, Los Angeles, CA, March 5 - 9, 2018.

A discrete particle model of diffusion-limited dissolution, poster presentation at Computational Science Graduate Fellowship Annual Program Review, Arlington, VA, July 24 - 27, 2017.

Interfacial dynamics of dissolving objects from discrete and continuum perspectives, SIAM Computational Science and Engineering 2017, Atlanta, GA, February 27 - March 3, 2017.

Detection of the gamma-ray albedo of solar system bodies, APS April Meeting, Baltimore, MD, April 11 - 14, 2015.

FELLOWSHIPS AND AWARDS

Quantitative Biology Student Fellowship NSF-Simon Center for the Mathematical & Statistical Analysis of Biology Harvard University	2020 — Present
Computational Science Graduate Fellowship Department of Energy	2016 — 2020
Peirce Fellowship Paulson School of Engineering and Applied Sciences, Harvard University	2016
Henry A. Boorse Prize Barnard College, Columbia University	2015
Grace Potter Rice Fellowship Barnard College, Columbia University	2015

TEACHING EXPERIENCE

Teaching fellow at School of Engineering and Applied Sciences, Harvard University

<i>Semester</i>	<i>Course</i>	<i>Instructor</i>
Fall 2017	AM205	Prof. Chris Rycroft
Fall 2020	AM205	Prof. Chris Rycroft

SKILLS

Computing: C/C++, Fortran, Python, AMReX, Mathematica, Xcode/Swift, OpenMP, MPI, OpenACC, Git

Analytical: Continuum and stochastic modeling, numerical methods, agent-based modeling, statistical analysis and inference

Language: English, Mandarin

Others: Final Cut Pro, POV-Ray, Adobe Illustrator