

February 3, 2022

## CURRICULUM VITAE

**Leroy L. Jia**

Center for Computational Biology, Flatiron Institute  
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Citizenship: USA

### Positions Held

Flatiron Research Fellow, Center for Computational Biology, Flatiron Institute 2018-  
Supervisor: Prof. Michael Shelley

### Visitng Positions

Visitor, Courant Institute of Mathematical Sciences, New York University 2019-2020  
Visiting Scientist, Department of Physics, Brown University 2018-2019  
Postdoctoral Research Associate, School of Engineering, Brown University 2018  
Supervisor: Prof. Thomas Powers (1 mo. courtesy appointment)

### Education

Ph.D. Applied Mathematics, Brown University 2018  
Advisors: Profs. Thomas Powers & Robert Pelcovits  
Thesis: "Geometry and Mechanics of Self-Assembling Colloidal Membranes"  
Sc.M. Engineering, Brown University 2017  
Sc.M. Applied Mathematics, Brown University 2013  
B.S. Physics, Georgia Institute of Technology 2012  
B.S. Applied Mathematics, Georgia Institute of Technology 2012  
Certificate in I/O Psychology, Georgia Institute of Technology 2012

### Awards and Honors

Sigma Xi, Brown University Chapter 2018  
Recognized as Outstanding TA by the Alpha Epsilon chapter of Kappa Alpha Theta 2014  
School of Mathematics MCTP Scholarship, Georgia Institute of Technology 2012  
School of Mathematics MCTP Scholarship, Georgia Institute of Technology 2011  
Hitohiro Fukuyo Memorial Award, Georgia Institute of Technology 2011

### Research Interests

*Applied mathematics*: analysis of ODE & PDE, geometry of surfaces, asymptotics, numerics  
*Theory of soft matter*: membranes, fluid interfaces, colloids, liquid crystals, active matter  
*Biomechanical engineering*: complex fluids, elasticity, self-assembly, bio-inspired materials

**Publications** (ORCID: 0000-0003-1968-4767)

8. L. L. Jia, W. T. M. Irvine, M. J. Shelley. “A boundary integral method for active chiral monolayers.” In preparation.
7. J. Robaszkowski, L. L. Jia, R. Adkins, R. A. Pelcovits, T. R. Powers, Z. Dogic. “Inducing vesicle formation in colloidal membranes by controlling membrane thickness.” To be submitted Spring 2022.
6. L. L. Jia, W. T. M. Irvine, M. J. Shelley. “Free-boundary problems for odd fluids. I. Formulation and axisymmetric flows.” To be submitted February 2021.
5. A. Khanra, L. L. Jia, N. P. Mitchell, A. Balchunas, R. A. Pelcovits, T. R. Powers, Z. Dogic, P. Sharma. “Topological folding of colloidal membranes through control of the Gaussian modulus.” To be submitted February 2021.
4. L. L. Jia, M. J. Shelley. “The role of monolayer viscosity in Langmuir film hole closure dynamics.” Preprint available at [arXiv:2201.00908](https://arxiv.org/abs/2201.00908).
3. L. L. Jia, S. Pei, R. A. Pelcovits, T. R. Powers. “Axisymmetric membranes under external force: buckling, minimal surfaces, and tethers.” *Soft Matter* **17** (2021) 7268. *Selected as Front Cover*.
2. A. Balchunas, L. L. Jia, M. J. Zakhary, J. Robaszkowski, T. Gibaud, Z. Dogic, R. A. Pelcovits, T. R. Powers. “Force-induced formation of twisted chiral ribbons.” *Phys. Rev. Lett.* **125** (2020) 018002.
1. L. L. Jia, M. J. Zakhary, Z. Dogic, R. A. Pelcovits, T. R. Powers. “Chiral edge fluctuations of colloidal membranes.” *Phys. Rev. E* **95** (2017) 060701(R).

**Presentations and Posters**

- Seminar, Northwestern University (February 2022)
- Contributed talk, APS Division of Fluid Dynamics Meeting (November 2021)
- Seminar, Flatiron Center for Computational Biology Brown Bag Seminar (September 2021)
- Contributed talk, APS March Meeting (March 2021)
- Seminar, Flatiron Center for Computational Biology Virtual Retreat (January 2021)
- Seminar, Flatiron Center for Computational Biology Brown Bag Seminar (May 2020)
- Contributed talk, APS Division of Fluid Dynamics Meeting (November 2019)
- Contributed talk, APS March Meeting (March 2019)
- Contributed talk, APS Division of Fluid Dynamics Meeting (November 2018)
- Poster, Brandeis University, MRSEC Site Visit (May 2018)
- Poster (w/ J. Robaszkowski), Brandeis University, MRSEC Site Visit (May 2018)
- Poster (w/ A. Balchunas), Brandeis University, MRSEC Site Visit (May 2018)
- Invited Speaker, SIAM Conference on the Life Sciences (August 2018)

- Seminar, Flatiron Institute (May 2018)
- Seminar, Brown University (May 2018)
- Seminar, UMass Amherst (April 2018)
- Contributed talk, APS March Meeting (March 2018)
- Contributed talk, APS March Meeting (March 2017)
- Poster, Brown University, Department of Physics Poster Session (November 2016)
- Seminar, Brandeis University (October 2016)
- Contributed talk, New England Complex Fluids Workshop (September 2016)
- Contributed talk, APS March Meeting (March 2016)
- Seminar, Brown University Applied Math Graduate Seminar (March 2016)
- Presentation, Brown University Applied Math Graduate Retreat (September 2015)
- Seminar, Brandeis University (August 2015)
- Poster, UC Boulder, Boulder Summer School in Condensed Matter Physics (July 2015)
- Presentation, Kobe University (August 2014)

### Schools and Workshops Attended

#### *Research related*

- Flatiron-wide Algorithms and Mathematics, Flatiron Institute (October 2021)
- The Physics of Elastic Films: from Biological Membranes to Extreme Mechanics, Kavli Institute for Theoretical Physics (May-June 2021)
- Flatiron-wide Algorithms and Mathematics, Flatiron Institute (October 2020)
- Universality: Turbulence Across Vast Scales, Flatiron Institute (December 2019)
- Flatiron-wide Algorithms and Mathematics, Flatiron Institute (October 2019)
- Supercomputing in Plain English, University of Oklahoma Supercomputing Center for Education and Research (Spring 2018)
- Boulder Summer School in Condensed Matter Physics, UC Boulder (July 2015)
- Summer School on Soft Solids and Complex Fluids, UMass Amherst (June 2015)
- Brown-ICERM-Kobe Simulation Summer School, Brown University/RIKEN/Kobe University, (August-September 2014)

#### *Teaching related*

- Flatiron Lodestar Workshop, Flatiron Institute (Fall 2021)
- Course Design Seminar, Sheridan Center for Teaching and Learning (Spring 2018)
- Teaching Consultant Program, Sheridan Center for Teaching and Learning (Fall 2017-Spring 2018)
- Reflective Teaching Seminar, Sheridan Center for Teaching and Learning (Fall 2016)

- Graduate TA Preparation Workshops, Brown University (Fall 2013)
- Undergraduate TA Preparation Workshops, Georgia Institute of Technology (Fall 2011)

## Teaching Experience

### *Instructor (Brown University)*

- APMA 0160 Introduction to Scientific Computing (Summer 2017)
- New Scientist Program Catalyst Content Instructor and Peer Mentor (Summer 2014). NSP Catalyst is a summer program that mentors aspiring STEM majors from traditionally underrepresented groups. My course had online and lecture components and was about complex numbers, differential equations, and linear stability theory.

### *Teaching Consultant (Brown University)*

- Brown University Sheridan Center Teaching Consultant (Fall 2017-Spring 2018). Teaching consultants facilitate workshops and meet with and provide feedback to new TAs.

### *Graduate Teaching Assistant (Brown University)*

- Sheridan Teaching Seminar (Fall 2017)
- APMA 0350 Honors Methods of Applied Math I (Spring 2015)
- APMA 0340 Methods of Applied Math II (Fall 2014, Spring 2013). Recognized as an Outstanding TA by the Alpha Epsilon chapter of Kappa Alpha Theta (Fall 2014).
- APMA 0330 Methods of Applied Math I (Spring 2014)
- Grader for APMA 1360 Topics in Chaotic Dynamics (Spring 2014) and APMA 1650 Statistical Inference I (Fall 2012)

### *Undergraduate Teaching Assistant (Georgia Institute of Technology)*

- MATH 1502 Calculus II with Linear Algebra (Spring 2012, Fall 2011)
- PHYS 2211 Introductory Physics I (Spring 2012 x3, Spring 2011 x4, Spring 2010 x4, Spring 2009) [multiplier indicates number of sections served that semester]
- PHYS 2212 Introductory Physics (Fall 2011 x2, Fall 2010 x4, Fall 2009 x2) [multiplier indicates number of sections served that semester]
- PHYS 2232 Honors Introductory Physics II (Fall 2011 x1) [multiplier indicates number of sections served that semester]
- Grader for MATH 4107 Abstract Algebra I (Fall 2011, Spring 2011), MATH 4318 Analysis II (Spring 2012), and MATH 4347 Partial Differential Equations I (Fall 2010)

## Students Mentored

- Research mentor for Steven Pei, undergraduate research (UTRA) student in physics (Fall 2016-Fall 2018). Co-advised with T. Powers. Steven is currently a software engineer at Google.

- Senior project and college mentor for Xingjian “Jackson” Gao, high school student (Summer 2017-Fall 2017). Jackson is now a CS/applied math major at UC Berkeley.
- College mentor for Chia-Yuan “Calvin” Chang, high school student (Summer 2017). Calvin is now a CS/applied math major at UC Davis.

### Outreach and Service Activities

- Flatiron Institute Lodestar Professional Development Program Committee (Winter 2021-Spring 2022)
- KITP Films ’21 Advice for PhD Students Panelist (June 2021)
- Brown University New Teaching Assistant Orientation Facilitator (Fall 2017)
- Brown University Applied Math Grad-Undergrad Mentor (Spring 2016-Spring 2018)
- Brown University New International Graduate Student Orientation Peer Mentor (Fall 2016, Fall 2017)
- Brown Applied Math Graduate Retreat Project Leader (Fall 2016). My project was about the Euler-Plateau problem.
- Mandarin-English Language Exchange Volunteer Teacher (Spring 2013-Spring 2018) and Japanese-English Language Exchange Volunteer Teacher (Spring 2018-Fall 2020)
- Brown University Math Resource Center Tutor (Fall 2012-Spring 2018)
- Georgia Tech Math Lab Tutor (Fall 2011-Spring 2012)
- Team Leader for GT 1000 Freshman Seminar, engineering section (Spring 2011)
- Team Leader for GT 1000 Freshman Seminar, physics section (Fall 2010)
- Volunteer math tutor for ESOL middle school students (Fall 2007-Spring 2008)

### Personal

- Citizenship: USA (*jus soli*)
- Technical: MATLAB, Mathematica, C++, Python, Java (including Android app development), HTML, 3D printing training from Brown Design Workshop, Blender
- Languages: Mandarin Chinese (fluent), Japanese (conversational)
- Memberships: APS (DFD & DSOF), SIAM

**References**

Mr. Joseph Browne  
Site Director, Northeastern at SMASH  
[joseph.browne@smash.org](mailto:joseph.browne@smash.org)

Prof. Robert Pelcovits  
Department of Physics, Brown University  
[robert\\_pelcovits@brown.edu](mailto:robert_pelcovits@brown.edu)

Prof. Thomas Powers  
School of Engineering & Department of Physics, Brown University  
[thomas\\_powers@brown.edu](mailto:thomas_powers@brown.edu)

Prof. Michael Shelley  
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