

Rahul Chajwa

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Stanford University
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Research interests: Soft Condensed Matter, Physics of Living Systems and Carbon Cycle

ACADEMIC POSITION

Mar 2021 - Present Postdoctoral Researcher
former Cross Disciplinary Fellow of Human Frontier Science Program
Department of Bioengineering, **Stanford University**
Advisor: Prof. Manu Prakash, manup@stanford.edu

EDUCATION

- **PhD in Physics**

May 2015 - Feb 2021 **International Centre for Theoretical Sciences, TIFR** Bangalore, India
Advisors: Prof. Sriram Ramaswamy, FRS, sriram@iisc.ac.in
Prof. Rama Govindarajan, rama@icts.res.in
Prof. Narayanan Menon, menon@physics.umass.edu

Mar 2017 - Sept 2017 **University of Massachusetts Amherst**, Short-term Scholar
Advisor: Prof. Narayanan Menon

- **Integrated BS-MS in Physics**

Aug 2010 - May 2015 **Indian Institute of Science Education and Research**, Mohali, India

TEACHING EXPERIENCE

- TA for Physiology Course at the Marine Biological Laboratory, 2024
with Prof. Manu Prakash
Two weeks long course in which I mentored three grad students on a project on the experimental and theoretical aspects of marine snow in coastal ecosystems.
- TA for Statistical Mechanics at TIFR Hyderabad, 2016
with Prof. Mustansir Barma, *Padma Shri* (fourth highest civilian award in India)
Mandatory PhD level Physics Course carrying 4 credits
My duties involved making and evaluating assignment and exam questions; and holding tutorials.

- TA for SageMath Programming at IISER Mohali, 2014 with Prof. Kapil Paranjape, Mathematics Department
Mandatory Undergraduate Semester-long course carrying 4 credits
My duties involved organizing hands-on programming sessions twice a week.
- Working towards the Postdoctoral Teaching Certificate at Stanford University.

Academic Mentorship:

1 grad student (Harshit Joshi with Prof. Rama Govindarajan), 3 undergraduates (Sebastian Burger and Farid Zaheer with Prof. Rama Govindarajan and Rintaro Kirikawa with Prof. Narayanan Menon).
This included mentoring through the DAAD RISE program, for which I wrote the proposal.

HONOURS & AWARDS

- **Invited Panelist with the Science and Technology Advisor to the Secretary of State**
This was a high-level panel to discuss the lights and shadows of multilateral scientific collaboration at the 23rd HFSP Awardees Meeting, Washington DC (2024).
- **Stanford Bio-X Travel Award**, Stanford University (2023). **500 USD** for APS March Meeting travel 2023.
- Selected for Participation in the **10th Global Young Scientists Summit** organized by the National Research Foundation, Singapore (2022).
- **HFSP Cross Disciplinary Fellowship**, Human Frontier Science Program Organization (2021).
Award amount: **203000 USD** for the period 1 May 2021 – 30 April 2024.
HFSP further highlighted me in their annual report 2021.
- **TIFR Best Thesis Award in Physics 2021**, Tata Institute of Fundamental Research, Mumbai.
This is a highly competitive award that selects one PhD thesis across all TIFR centers.
- **Infosys Foundation ICTS Excellence Grant**, International Centre for Theoretical Sciences TIFR (2020)
- **Visiting Student Research Program Fellowship**, Tata Institute of Fundamental Research (2014)
- **IAS Summer Research Fellowship**, Indian Academy of Sciences, Bangalore (2013)
- **Innovation in the Pursuit of Scientific Excellence (INSPIRE) Scholarship** (2010 - 5 years)
awarded by the Department of Science and Technology, India to meritorious students with aggregate marks within the top 1% of the Class XII Board Exam.
- **Union Public Service Commission, NDA & NA exam** (2010).
Selected for Flying Branch in the Air Force, with all India rank 83 among 300 thousand applicants.

OUTREACH AND SERVICE

- Organized Magnifying Science in Field Settings outreach event as part of Promise in Science and Mathematics (PRISM) at the International Center for Theoretical Sciences TIFR, May 2024.
- Organized a Squishy Science at Sea event as part of the American Physical Society (DSOFT) Squishy Science Sunday outreach at the APS March Meeting 2024.

- Teaching in the Building UP Developing Scientist (BioBUDS) at Stanford University, Mar 2024.
- Teaching in Stanford Splash Fall 2022.
- Served as a jury for science exhibits in the National Children Science Congress 2019, a program by Department of Science & Technology, Government of India.

INVITED TALKS

- Suspensions with Internal Degrees of Freedom, Physics Colloquium, **University of Oregon**, 2025.
- Cellular Slingshots and Hidden Comet-tails in the Ocean, **SLAAM (Soft, Living, Active and Adaptive Matter) Seminar**, American Physical Society (DBIO, DSOFT) 2025.
- Suspensions with Internal Degrees of Freedom, James Franck Institute, **University of Chicago** 2025.
- Biology Seminar, **Institute for Advanced Study, Princeton** 2024. (8-hour presentation)
- Flow and Self-Organization in the Biological Pump, **Kavli Institute for Theoretical Physics** 2024.
- Hidden Comet-tails in Marine Snow Impede Ocean-based Carbon Sequestration, International Human Frontier Science Program Organization Meeting 2024, **National Academy of Sciences, Washington DC**.
- Surprises in Driven Stokesian Suspensions: on land and sea, Physics Seminar, **Indian Institute of Technology Gandhinagar** 2024
- Magnifying Science in Field Settings, PRISM Outreach, **International Center for Theoretical Sciences TIFR** 2024
- Cellular Slingshots and Hidden Comet-Tails in the Oceans, Fluid and Turbulence Seminar, **International Center for Theoretical Sciences TIFR** 2024
- Surprises in Driven Stokesian Suspensions: on land and sea, Physics Seminar, **Tata Institute of Fundamental Research Hyderabad** 2024.
- Surprises in Driven Stokesian Suspensions, Soft Matter Seminar, **Indian Institute of Science Education and Research Mohali** 2024.
- Active Caustics, Active matter in complex environments conference, **Aspen Center for Physics** 2023
- Motile particles without inertia form caustics in vortical flows, **APS March Meeting 2022**, abstract id.S20.006

PUBLICATIONS AND PREPRINTS

- [6] **R. Chajwa**, E. Flaum, K.D. Bidle, Benjamin Van Mooy, Manu Prakash, *Hidden Comet-Tails of Marine Snow Impede Ocean-based Carbon Sequestration*, **Science** 386, ead15767 (2024).
[10.1126/science.adl5767](https://doi.org/10.1126/science.adl5767)

Perspective: B. B. Cael, Lionel Guidi, *Tiny comets under the sea*. **Science** 386, 149-150(2024).
[10.1126/science.ads5642](https://doi.org/10.1126/science.ads5642)

Featured in: [ScienceNews](#), [Stanford Report](#), [New York Times](#)

- [5] **R. Chajwa**, Rajarshi, Sriram Ramaswamy, Rama Govindarajan, *Active Caustics*, [arXiv:2310.01829](https://arxiv.org/abs/2310.01829) [cond-mat.soft](2023) [Submitted]
- [4] A.G. Larson[†], **R. Chajwa**[†], Hongquan Li, Manu Prakash, *Inflation induced motility for long distance vertical migration*, **Current Biology** **34**, 1-15 (2024). [†] Equal Contribution
Featured in: Nature **634**, 1021 (2024), *ScienceNews*, *BBC*
- [3] **R. Chajwa**, N. Menon, S. Ramaswamy, R. Govindarajan, *Waves, Algebraic Growth, and Clumping in Sedimenting Disk Arrays*, **Phys. Rev. X** **10**, 041016 (2020).
- [2] L.P. Dadhichi, J. Kethapelli, **R. Chajwa**, A. Maitra and S. Ramaswamy, *Nonmutual torques and the unimportance of motility for long-range order in two-dimensional flocks*, **Phys. Rev. E** **101**, 052601 (2020).
- [1] **R. Chajwa**, N. Menon and S. Ramaswamy, *Kepler Orbits in Pairs of Disks Settling in a Viscous Fluid*, **Phys. Rev. Lett.** **122**, 224501 (2019).

REFERENCES

PhD Advisors

- *Prof. Sriram Ramaswamy*, FRS
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- *Prof. Rama Govindarajan*
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- *Prof. Narayanan Menon*
Department of Physics
University of Massachusetts Amherst 01002 MA USA
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Postdoctoral Advisor

- *Prof. Manu Prakash*, MacArthur Fellow
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