

Curriculum Vitae and Table of Contents

Steven Tarr

Graduate Student, School of Physics

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Steven Tarr
 Graduate Student
 School of Physics
 Georgia Institute of Technology

I. Earned Degrees

Ph.D. (in progress)	Physics	2019-present	Georgia Institute of Technology, Atlanta, GA, USA (advisor: E. Alicea-Muñoz)
B.S. Cum Laude	Physics	2015-2019	Brandeis University, Waltham, MA, USA (advisor: B. Chakraborty)

II. Employment History

2023-present	Graduate Research/Teaching Assistant, Georgia Institute of Technology (advisor: E. Alicea-Muñoz)
2020-2022	Graduate Research/Teaching Assistant, Georgia Institute of Technology (advisor: D. I. Goldman)
2017-2019	Undergraduate Research Assistant, Brandeis University (advisor: B. Chakraborty)
2016	Intern, Maker Depot, LLC
2015-2019	Student Worker, Brandeis University MakerLab
2013-2015	Ambassador, Liberty Science Center

III. Honors and Awards

2023	Recipient of CIRTLL Associate Certificate from the GT Center for Teaching and Learning
2022	Awarded part of the Amelio Travel Fund from the Graduate Committee of the GT School of Physics
2021	Awarded part of the Amelio Travel Fund from the Graduate Committee of the GT School of Physics
2019	Highest Honors in Physics from Brandeis University

IV. Research, Scholarship, and Creative Activities

(* next to item indicates work done at Brandeis University; all other work was at Georgia Institute of Technology)

A. Published Books, Book Chapters, and Edited Volumes

A1. Books

No data

A2. Refereed Book Chapters

No data

A3. Edited Volumes

No data

B. Refereed Publications and Submitted Articles

B1. Published and Accepted Journal Articles

Probing Hydrodynamic Fluctuation-Induced Forces with an Oscillating Robot, Tarr S W, Brunner J S, Soto D, Goldman D I (published with **Physical Review Letters** on 20 Feb, 2024), <https://doi.org/10.1103/PhysRevLett.132.084001>.

A robophysical model of spacetime dynamics, Li S, Gynai H N, Tarr S W, Alicea-Muñoz E, Laguna P, Li G, Goldman D I (published with **Scientific Reports** on 7 Dec, 2023), <https://doi.org/10.1038/s41598-023-46718-4>.

B2. Conference Presentations with Proceedings (Refereed)

No data

B3. Other Refereed Material

No data

B4. Submitted Journal Articles (with date of submission)

Hands-on experiments in an upper division classical mechanics course, Tarr S W, Brunner J S, Alicea-Muñoz E, Goldman D I (submitted to **American Journal of Physics** on 23 Jan, 2024).

C. Other Publications and Creative Products

*Tarr S (2019) Comparing the dynamics of three types of lattice-bound active particles. Undergraduate Thesis Defense, **Brandeis University**.

D. Presentations**Invited presentations at conferences:**

No data

Invited presentations at universities & institutes:

No data

Contributed presentations at conferences:

Tarr S, Brunner J, Soto D, Goldman D I (Mar 2023) Boundary-driven Surface Wave Forces from a Self-propelling Vibrating Robot Boat. Oral presentation by S. Tarr, **American Physical Society March Meeting**, Las Vegas, NV.

Diaz Cruz K, Zhong B, Tarr S, Erickson E, Goldman D I (Mar 2023) Water surface swimming dynamics via continuous contact in lightweight centipedes. Oral presentation by B. Zhong, **American Physical Society March Meeting**, Las Vegas, NV.

Diaz Cruz K, Tarr S, Zhong B, Goldman D I (Jan 2023) Water surface swimming via continuous contact in a centipede. Oral presentation by K. Diaz Cruz, **SICB Annual Meeting**, Austin, TX.

Soto D, Hwang J, Tarr S, Diaz Cruz K, Goldman D I (May 2022) Novel robot design for collective transport of soft matter in complex environments. Poster presentation by D. Soto, **IEEE International Conference on Robotics and Automation**, Philadelphia, PA.

Tarr S, Aydin E, Goldman D I (Mar 2022) Locally Induced Analog Casimir Force from a Self-propelling Vibrating Robot Boat. Oral presentation by S. Tarr, **American Physical Society March Meeting**, Chicago, IL.

Diaz Cruz K, Tarr S, Goldman D I (Mar 2022) Water surface swimming dynamics in centipedes. Oral presentation by K. Diaz Cruz, **American Physical Society March Meeting**, Chicago, IL.

Brunner J S, Margolis J, Tarr S, Soto D, Goldman D I (Mar 2022) Investigating Orbits of a Textbook Mass-Pulley System. Oral presentation by J. S. Brunner, **American Physical Society March Meeting**, Chicago, IL.

Diaz Cruz K, Tarr S, Goldman D I (Jan 2022) Water surface swimming dynamics in a centipede. Oral presentation by K. Diaz Cruz, **SICB Annual Meeting**, Phoenix, AZ.

Tarr S, Aydin E, Goldman D I (Nov 2021) Surface Wave and Transport Dynamics of a Self-propelling Vibrating Robot Fan Boat. Oral presentation by S. Tarr, **Annual Meeting of the APS Division of Fluid Dynamics**, Phoenix, AZ.

Diaz Cruz K, Tarr S, Goldman D I (Nov 2021) Surface swimming dynamics of centipedes. Oral presentation by K. Diaz Cruz, **Annual Meeting of the APS Division of Fluid Dynamics**, Phoenix, AZ.

- Tarr S, Castleman B, Aydin E, Goldman D I (Mar 2021) Active Transport Dynamics with Wave-Based Interactions. Oral presentation by S. Tarr, **American Physical Society March Meeting**, online.
- Li S, Gynai H, Ozkan-Aydin Y, Tarr S, Laguna P, Goldman D I (Mar 2021) Substrate-mediated interaction of active agents on an elastic substrate. Oral presentation by S. Li, **American Physical Society March Meeting**, online.
- Gynai H, Li S, Ozkan-Aydin Y, Tarr S, Aydin E, Laguna P, Goldman D I (Mar 2021) Nonlocal control of active agents on a deformable substrate. Oral presentation by H. Gynai, **American Physical Society March Meeting**, online.
- *Tarr S, Dutta B, Chakraborty B, Goldman D I (Oct 2018) Programming Collective Behaviors with Brownian Robots. Table talk by S. Tarr, **Greater Boston Area Statistical Mechanics Meeting**, Waltham, MA.
- *Tarr S, Dutta B, Chakraborty B, Goldman D I (Aug 2018) Programming Collective Behaviors with Brownian Robots. Poster presentation by S. Tarr, **Brandeis University SciFest VIII**, Waltham, MA.
- *Roy I, Tynes J, Henning T, Simonson A, Tarr S, Cox K (Sept 2017) Instilling a Maker Mindset on Campus. Panel discussion moderated by I. Roy and J. Tynes, **World Maker Faire NY**, Corona, NY.

E. Grants and Contracts

E1. As Principal Investigator

No data

E2. As Co-Principal Investigator

No data

E3. As Senior Personnel or Contributor

No data

E4. Pending Proposals

No data

E5. Proposals Submitted but not Funded (last 2 years)

04/2021-04/2026 NSF GRFP (Graduate Research Fellowships Program) (3-year annual stipend of \$34,000 + \$12,000 cost of education allowance to GT) "Active Transport Dynamics with Wave-Based Interactions"

04/2021-04/2024 DoD NDSEG (National Defense Science and Engineering Graduate) Fellowship Program (\$38,400 annual stipend paid monthly + \$5,000 travel budget + \$1,200 annual health insurance + full tuition and fees to GT) "Active Transport Dynamics with Wave-Based Interactions"

F. Other Scholarly and Creative Accomplishments

No data

G. Societal and Policy Impacts

No data

H. Other Professional Activities

10/27/2021 Completed **Entering Mentoring** training workshop for graduate students and postdoctoral researchers offered by the Georgia Tech Undergraduate Research Opportunities Program in partnership with the Georgia Tech Graduate Education and Faculty Development office.

V. Teaching**A. Courses Taught (last 6 years)**

No data

B. Individual Student Guidance**B1. PhD Students**

No data

B2. M.S. students

No data

B3. Undergraduate Students

Dev Shah - Georgia Institute of Technology Mechanical Engineering major, Spring 2024 through present

Joseph Brunner - Georgia Institute of Technology Physics major, Summer 2021 through Summer 2023

Joshua Margolis - Georgia Institute of Technology Physics major, Summer & Fall semesters 2021

Blake Castleman - Georgia Institute of Technology Mechanical Engineering major, Fall semester 2020

B4. High School Student Interns

Ryan Hirsh – Interning at Georgia Institute of Technology, Summer semester 2022

B5. Service on Thesis or Dissertation Committees

No data

B6. Mentorship of Postdoctoral Fellows and Visiting Scholars

No data

C. Other Teaching Activities

(* next to item indicates work done at Brandeis University; all other roles were at Georgia Institute of Technology)

Teaching Assistantships:

Fall 2023	CETL 8000	Physics GTA Preparation	Prof. E. Alicea-Muñoz
Spring 2023	PHYS 2212 Head TA	Intro Physics II	Profs. E. Alicea-Muñoz & Z. Jiang
Fall 2022	CETL 8000	Physics GTA Preparation	Prof. E. Alicea-Muñoz
Summer 2022	PHYS 2212	Intro Physics II	Profs. E. Alicea-Muñoz & E. Greco
Spring 2022	PHYS 2212	Intro Physics II	Profs. E. Murray & M. Jarrio
Fall 2021	PHYS 3201	Classical Mechanics I	Prof. D. Goldman
Summer 2020	PHYS 2212	Intro Physics II	Profs. M. Schatz & E. Greco
Spring 2020	PHYS 2212	Intro Physics II	Profs. E. Murray & M. Jarrio
Fall 2019	PHYS 2212	Intro Physics II	Profs. E. Murray & M. Jarrio
*Spring 2019	PHYS 110A	Mathematical Physics	Prof. B. Chakraborty

Guest Lectures:

Through the Brandeis University Scientists in the Classroom Workshop, I gave a guest lecture on individualism in STEM and how to turn a passion for creative arts into success as a scientist to four separate classes of 15-30 high school students (Waltham HS, MA, USA) in April 2019.

VI. Service**A. Professional Contributions**

No data

B. Public and Community Service

Volunteer moderator for the U.S. Department of Energy Science Bowl regional competition hosted at Georgia Institute of Technology in February 2024.

C. Institute Contributions

No data