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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

2025 Recipient of Tech to Teaching Certificate from the GT Center for Teaching and Learning
2025 Recipient of the Georgia Tech Institute-wide Graduate Student Instructor of the Year award
2025 Recipient of the School of Physics Graduate Student Instructor of the Year award
2024 Awarded part of the Amelio Travel Fund from the Graduate Committee of the GT School of Physics
2023 Recipient of CIRTL 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

The value of hands-on experiments in an upper division classical mechanics course, Tarr S W, Brunner J S, Alicea-Muñoz E, Goldman D I (**published with Emergent Scientist** on 31 Jan, 2025), https://doi.org/10.1051/emsci/2024003.

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)

Reflecting to learn in a physics multimedia communication course, Tarr S W, Alicea-Muñoz E (**published in 2024 Physics Education Research Conference Proceedings** on 12 Sep, 2024), https://doi.org/10.1119/perc.2024.pr.Tarr.

B3. Other Refereed Material

No data

B4. Submitted Journal Articles (with date of submission)

No data

C. Other Publications and Creative Products

Appell D (9 Mar, 2024) An oscillating robot can propel itself via the reflection of water waves. Press release featured in **Tech Xplore**, https://techxplore.com/news/2024-03-oscillating-robot-propel.html.

*Tarr S (2019) Comparing the dynamics of three types of lattice-bound active particles. Undergraduate Thesis Defense, **Brandeis University**, http://hdl.handle.net/10192/36664.

D. Presentations

Invited presentations at conferences:

No data

Invited presentations at universities & institutes:

Tarr S W (Jun 2025) Education Research & Science Communication. Oral presentation by S. Tarr, **Georgia Institute of Technology Research Experiences for Pre-Service Teachers Program Lunch and Learn**, Atlanta, GA.

Contributed presentations at conferences:

Tarr S W, Alicea-Muñoz E (Aug 2025) Defining Success in Science Multimedia Communication Courses. Poster presentation by S. Tarr, **Physics Education Research Conference**, Washington, DC.

Tarr S W, Alicea-Muñoz E (Aug 2025) Defining Success in Science Multimedia Communication Courses. Oral presentation by S. Tarr, **American Association of Physics Teachers Summer Meeting**, Washington, DC.

Creyts A, Tarr S W, Alicea-Muñoz E (Aug 2025) Can Students Solve for x: Introductory Physics Students' Approaches to Problem Solving. Poster presentation by A. Creyts, **Physics Education Research Conference**, Washington, DC.

Creyts A, Tarr S W, Alicea-Muñoz E (Aug 2025) Can Students Solve for x: Introductory Physics Students' Approaches to Problem Solving. Oral presentation by A. Creyts, **American Association of Physics Teachers Summer Meeting**, Washington, DC.

Tarr S W, Alicea-Muñoz E (Jul 2024) Reflecting to Learn in a Physics Multimedia Communication Course. Poster presentation by S. Tarr, **Physics Education Research Conference**, Boston, MA.

Tarr S W, Alicea-Muñoz E (Jul 2024) Reflecting to learn in a physics multimedia communication course. Oral presentation by S. Tarr, **American Association of Physics Teachers Summer Meeting**, Boston, MA.

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
Submitted 06/2025, Spencer Foundation Research Grants on Education: Large Proposal Number 10068750 (total budget of $500,000 including monthly stipend, travel budget, and full tuition and fees to GT) "The Many Faces of Science Communication in the Classroom"

Submitted 01/2025, NSF IUSE (Improving Undergraduate STEM Education) Proposal Number 2519018 (3-year annual stipend of $37,500 annual stipend paid monthly + $10,000 travel budget + full tuition and fees to GT) "The Many Faces of Science Communication in the Classroom"

E5. Proposals Submitted but not Funded (last 2 years)
01/2024-01/2027 NSF IUSE (Improving Undergraduate STEM Education) Proposal Number 2417166 (3-year annual stipend of $35,500 annual stipend paid monthly + $10,000 travel budget + full tuition and fees to GT) "The Many Faces of Science Communication in the Classroom"

F. Other Scholarly and Creative Accomplishments
No data

G. Societal and Policy Impacts
No data

H. Other Professional Activities

02/21/2025–02/23/2025	Applied to, admitted to, and attended **ComSciCon-Atlanta 2025**, a series of workshops designed to empower graduate students to better communicate science across multiple disciplines and to the general public.
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)

Spring 2025	PHYS 4602	Senior Seminar II	Co-instructor of record with Prof. I. Kimchi

B. Individual Student Guidance

B1. PhD Students
No data

B2. M.S. students
No data

B3. Undergraduate Students
Abigail Creyts - Georgia Institute of Technology Physics major, Fall 2024 through present

Dev Shah - Georgia Institute of Technology Mechanical Engineering major, Spring & Summer semesters 2024
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 2024	CETL 8000	Physics GTA Preparation	Prof. E. Alicea-Muñoz
Summer 2024	PHYS 2212	Intro Physics II	Prof. S. Behrens
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
Mentor for first-year physics graduate students through the Graduate Association of Physicists Mentoring Program at Georgia Institute of Technology in Fall and Spring semesters, 2021 through 2025.

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