

# Ian Ho

📞 917-288-8729 | ✉ ianho@stanford.edu | 🌐 ianaho.github.io | 📄 Google Scholar

## Research Interests

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Biological Fluid Mechanics, Physical Computing, Active Matter, Interfacial Phenomena

## Education

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**Stanford University, School of Engineering** **Stanford, CA**  
*Ph.D. Biological Engineering* 2021-  
**Advisor:** Manu Prakash

**Stanford University, School of Engineering** **Stanford, CA**  
*M.Sc. Biological Engineering* 2021-2023

**Brown University, School of Engineering** **Providence, RI**  
*B.Sc. Mechanical Engineering (Honors)* 2017-2021  
**Research Advisor:** Daniel Harris

## Research Experience

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**Prakash Lab (Stanford University)** **Stanford, CA**  
*Graduate Research — Advisor: Prof. Manu Prakash* 2022-

- **Coral Larvae Swimming Behavior**
  - 3D long-term tracking across the larval life cycle quantifies swimming states and transitions that shape dispersal strategies [1].
- **Parasite Interfacial Swimming**
  - Identified and modeled a novel interfacial swimming mode in schistosome larvae that enhances near-surface transport and dispersal [2].
- **Self-learning Mechanical Circuits**
  - Realized unsupervised learning in elastic networks where spring stiffness adapts as the learning degree of freedom, enabling programmable mechanical memory [3].

**Harris Lab (Brown University)** **Providence, RI**  
*Undergraduate Research — Advisor: Prof. Daniel Harris* 2018–2021

- **Self Propulsion and Collective Interaction of Capillary Surfers**
  - Established a capillary-wave-driven active-matter system of “surfer” particles with tunable self-propulsion and wave-mediated interactions [5,6].
- **Direct Measurement of Capillary Attraction**
  - Developed a magnetic force measurement platform to directly measure capillary attraction between floating cylinders [9].
- **Interfacial Drag on Floating Bodies**
  - Quantified skin-friction drag for centimeter-scale disks sliding on the air–water interface, isolating boundary-layer contributions [10].

**Breuer Lab (Brown University)** **Providence, RI**  
*Independent Study — Advisor: Prof. Kenny Breuer* 2020–2021

- **Energy Harvesting with Flexible Hydrofoils**
  - Measured how a flexible tip alters heaving–pitching hydrofoil dynamics and boosts energy-harvesting performance [8].

## In Preparation

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\*co-first author

- [1] **Ian Ho\***, Qing Zhang\*, Benjamin Foster, Elora López-Nandam, Rebecca Albright and Manu Prakash. Behavior plasticity in free swimming coral larvae via long term tracking microscopy. **In Preparation**, 2025.

- [2] Melanie Hannebelle, **Ian Ho** and Manu Prakash. Schistosomiasis parasite enhance transmission rates via interfacial swimming. **Submitted**, 2025. [\[PDF\]](#)
- [3] Vishal P. Patil\*, **Ian Ho\***, and Manu Prakash. Self-learning mechanical circuits. **Submitted**, 2024. [\[PDF\]](#)
- [4] **Ian Ho\***, Giuseppe Pucci\*, Anand U. Oza and Daniel M. Harris. Capillary surfers: wave-driven particles at a fluid interface. **Physical Review Fluids**, 2023. (“Editors’ Suggestion” and “Featured in Physics”). [\[PDF\]](#)  
[APS](#) | [FYFD](#) | [DFD Gallery of Fluid Motion](#)
- [6] Anand U. Oza , Giuseppe Pucci, **Ian Ho**, and Daniel M. Harris. Theoretical modeling of capillary surfer interactions on a vibrating fluid bath. **Physical Review Fluids**, 2023. (“Featured in Physics”) [\[PDF\]](#)
- [7] **Ian Ho**, Ajay Harishankar Kumar and Daniel M. Harris. Reconfigurable mechanical vibrations laboratory kit. **Journal of Open Hardware**, 2022. [\[PDF\]](#)
- [8] Howon Lee\*, **Ian Ho\*** and Kenneth Breuer. Energy harvesting performance of an oscillating hydrofoil with a flexible tip. **AIAA Scitech**, 2022. [\[PDF\]](#)
- [9] **Ian Ho**, Giuseppe Pucci, and Daniel M. Harris. Direct measurement of capillary attraction between floating disks. **Physical Review Letters**, 2019. (“Editors’ Suggestion” and “Featured in Physics”). [\[PDF\]](#)  
[APS](#) | [Ars Technica](#) | [Physics Buzz](#) | [News from Brown](#) | [Futurity](#)
- [10] Giuseppe Pucci, **Ian Ho**, and Daniel M. Harris. Friction on water sliders. **Scientific Reports**, 2019. [\[PDF\]](#)

## Contributed Presentations

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- **Ian Ho**, Qing Zhang, Elora López-Nandam, Rebecca Albright, Manu Prakash. *Behavioral plasticity in free-swimming coral larvae via long-term tracking microscopy*. APS March Meeting 2023, Las Vegas. [\[Bulletin\]](#)
- **Ian Ho**, Ajay Harishankar Kumar, Daniel M. Harris. *Skin friction on oscillating interfacial bodies*. APS DFD Meeting 2021, Phoenix. [\[Bulletin\]](#)
- Hongquan Li, *et al.* (incl. **Ian Ho**). *Pufferfish: Developing a rapidly scalable full-feature ventilator for COVID-19 patients with ARDS*. APS DFD Meeting 2020, Virtual. [\[Bulletin\]](#)
- **Ian Ho**, Giuseppe Pucci, Daniel M. Harris. *Direct measurement of capillary attraction between floating disks*. APS March Meeting 2019, Boston, MA. [\[Bulletin\]](#)

## Fellowships

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**Tau Beta Pi Fellowship (Stark No. 42)**: Among 28 selected, 2021-2022. [\[Link\]](#)

## Awards and Honors

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**Poster award**: Stanford Bio-X Interdisciplinary Seed Grants Program Poster Session (25/229), 2023. [\[Link\]](#)

**Stanford Bio-X Travel Award**: Travel award to attend APS March Meeting, 2023. [\[Link\]](#)

**Outstanding Senior Award in Mechanical Engineering**: Brown School of Engineering, 2021. [\[Link\]](#)

**Sigma Xi Honor Society**: Inducted 2021.

**Karen T. Romer Undergraduate Teaching and Research Award**: Awarded to conduct research at Brown University, 2019.

**Tau Beta Pi Engineering Honor Society**: Awarded to top 1/8 of Engineering Class, inducted 2019. [\[Link\]](#)

## Teaching Experience

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<b>Physiology: Modern Cell Biology — Marine Biological Laboratory (MBL)</b>	<b>Woods Hole, MA</b>
Teaching Assistant <a href="#">[Link]</a>	2025

<b>BIOE 271 Frugal Science — Stanford University</b>	<b>Stanford, CA</b>
Teaching Assistant	2023,2024,2025

<b>ENGN 1735 Vibration of Mechanical Systems — Brown University</b> <i>Teaching Assistant, Course Development</i> <a href="#">[7]</a>	<b>Providence, RI</b> 2021
<b>ENGN 1860 Advanced Fluid Mechanics — Brown University</b> <i>Teaching Assistant</i>	<b>Providence, RI</b> 2020
<b>Summer@Brown "Fluid Mechanics Through Hovercraft Physics" — Brown University</b> <i>Co-instructor</i>	<b>Providence, RI</b> 2018
<b>APMA 340 Ordinary Differential Equations</b> <i>Teaching Assistant</i>	<b>Providence, RI</b> 2018

## Field Research

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**2023:** *R/V Atlantic Explorer (Bermuda)* — Tracking microscopy measurements of acantharian sedimentation.  
**2022:** *R/V Sikuliaq (Alaska)* — Measurements of centric diatom buoyancy-regulation behavior.

## References

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Manu Prakash Associate Professor of Bioengineering Stanford University Ph.D. Advisor Email: <a href="mailto:manup@stanford.edu">manup@stanford.edu</a> Web: <a href="http://prakashlab.stanford.edu">prakashlab.stanford.edu</a>	Daniel M. Harris Associate Professor of Engineering Brown University Undergraduate Research Advisor Email: <a href="mailto:daniel_harris3@brown.edu">daniel_harris3@brown.edu</a> Web: <a href="http://sites.brown.edu/harrislab">sites.brown.edu/harrislab</a>	Vishal P. Patil Assistant Professor of Mathematics University of California, San Diego Co-author / Collaborator Email: <a href="mailto:vppatil@ucsd.edu">vppatil@ucsd.edu</a> Web: <a href="http://mathweb.ucsd.edu/vipatil">mathweb.ucsd.edu/vipatil</a>
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