

# Navish Wadhwa

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## RESEARCH INTERESTS

Biophysics, Bacterial Motility, Mechanobiology

## EMPLOYMENT

2016–Present **Postdoctoral Fellow**, *Harvard University*.  
Advisors: Dr. Howard Berg and Dr. Ethan Garner

## EDUCATION

- 2015 **Ph.D. in Physics**, *Technical University of Denmark*.  
Advisors: Dr. Anders Andersen, Dr. Thomas Kjørboe, Dr. Tomas Bohr  
Thesis: Zooplankton hydrodynamics: An investigation into the physics of aquatic interactions
- 2012 **M.Sc. in Engineering Mechanics**, *Virginia Tech*.  
Advisor: Dr. Sunghwan Jung  
Thesis: Non-coalescence of jets
- 2008 **B.Tech. in Mechanical Engineering**, *Indian Institute of Technology Delhi*.  
Advisor: Dr. Brijesh Eshpuniyani  
Thesis: Boundary element method (BEM) modeling of cardiovascular bubble dynamics

## OTHER RESEARCH TRAINING

- 2017 **Visiting Scientist**, *Janelia Research Campus*.  
Advisor: Jennifer Lippincott-Schwartz
- 2017 **Student, Physiology**, *Marine Biological Laboratory*.  
Supervisors: Rob Phillips, Jennifer Lippincott-Schwartz, Wallace Marshall
- 2016 **Student, Advanced Bacterial Genetics**, *Cold Spring Harbor Laboratories*.  
Supervisors: Andrew Camilli, Lionello Bossi, Houra Merrikh
- 2008–2010 **Junior Research Fellow**, *National Centre for Biological Sciences India*.  
Advisor: Sanjay Sane

## SELECT AWARDS AND FELLOWSHIPS

- 2019 **Meselson Prize for the most beautiful experiment of the year**, *MCB Harvard*.
- 2017 **Society of General Physiologists Scholar**, *Marine Biological Laboratory*.
- 2014 **Young Scientist Award**, *European Fluid Mechanics Conference*.
- 2010 **Gallery of Fluid Motion Winner**, *American Physical Society*.
- 2010 **Milton Van Dyke Award**, *American Physical Society*.
- 2009 **Junior Research Fellowship**, *National Centre for Biological Sciences*.

## FUNDING

- 2020–2025 **NIH Pathway to Independence Award (K99/R00)**, National Institute of General Medical Sciences, Direct cost: \$951,812.

## PUBLICATIONS

\*Co-first author, ‡Corresponding author

- [12] [Wadhwa N](#), Berg HC, 2021, Getting there: the many forms of bacterial motility, *submitted*.
- [11] [Wadhwa N<sup>‡</sup>](#), Tu Y, Berg HC, 2021, Mechanosensitive remodeling of the bacterial flagellar motor is independent of direction of rotation, [bioRxiv](#), 2021.01.19.427295.

- [10] Santiveri M, Roa-Eguiara A, Kühne C, Wadhwa N, ... Taylor NMI, 2020, Structure and function of stator units of the bacterial flagellar motor, **Cell**, 183, 244-257.
- [9] Wadhwa N<sup>‡</sup>, Phillips R, Berg HC, 2019, Torque-dependent remodeling of the bacterial flagellar motor, **PNAS**, 116, 11764-11769.
- [8] Andersen KH, Berge T, ... Wadhwa N, Kiørboe T, 2016, Characteristic sizes of life in the oceans, from bacteria to whales, **Annual Review of Marine Science** 8, 217-241.
- [7] Martens E\*<sup>‡</sup>, Wadhwa N\*<sup>‡</sup>, Jacobsen NS, Lindemann C, Andersen KH, Visser A, 2015, Size structures sensory hierarchy in ocean life, **Proceedings of the Royal Society B** 282, 20151346.
- [6] Andersen A, Wadhwa N, Kiørboe T, 2015, Quiet swimming at low Reynolds number, **Physical Review E** 91, 042712.
- [5] Kiørboe T, Jiang H, Gonçalves RJ, Nielsen LT, Wadhwa N, 2014, Flow disturbances generated by feeding and swimming zooplankton, **PNAS** 111, 11738-11743.
- [4] Wadhwa N<sup>‡</sup>, Andersen A, Kiørboe T, 2014, Hydrodynamics and energetics of jumping copepod nauplii and adults, **Journal of Experimental Biology** 217, 3085-3094.
- [3] Wadhwa N, Vlachos P, Jung S, 2013, Noncoalescence in the oblique collision of fluid jets, **Physical Review Letters** 110, 124502.
- [2] Wadhwa N, Jung S, 2011, Non-coalescence of jets, **Physics of Fluids** 23, 091105.
- [1] Wadhwa N, Jain V, Fowlkes JB, Bull JL, Eshpuniyani B, 2010, A boundary element model of multiple microcirculatory bubbles in cardiovascular, **International Journal of Emerging Multidisciplinary Fluid Sciences** 2, 143-160.

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## INVITED TALKS

- 2019 Princeton Center for the Physics of Biological Function.
- 2019 Brandeis Materials Research Science and Engineering Center.
- 2018 Brown Division of Applied Mathematics Fluids and Thermal Sciences.
- 2015 Cambridge Department of Applied Mathematics and Theoretical Physics.
- 2015 Max Planck Institute for Terrestrial Microbiology.
- 2014 Harvard School of Engineering and Applied Sciences.
- 2012 Jawaharlal Nehru Centre for Advanced Scientific Research.

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## SELECT CONFERENCE PRESENTATIONS

- 2020 Mechanobiology of stator remodeling in the bacterial flagellar motor, *American Physical Society March Meeting*, virtual.
- 2020 Physics behind the autonomous assembly of the bacterial flagellar motor, *Physics of Living Matter 15*, virtual.
- 2019 Torque- and speed-dependent remodeling of the bacterial flagellar motor, *American Society of Cell Biology Conference*, Washington, DC.
- 2014 How to be invisible as a microscopic swimmer, *Annual Meeting of American Physical Society's Division of Fluid Dynamics*, San Francisco, CA.
- 2014 Hydrodynamics and energetics of jumping copepod nauplii and adults, *European Fluid Mechanics Conference*, Kgs. Lyngby, Denmark.
- 2013 Size dependent flow structure changes in swimming copepods, *Microscale interactions in aquatic environments*, Les Houches, France.
- 2012 Bouncy Fluid Jets, *Annual Meeting of American Physical Society's Division of Fluid Dynamics*, San Diego, CA.
- 2011 Bouncing Jets, *Annual Meeting of American Physical Society's Division of Fluid Dynamics*, Baltimore, MD.

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## SERVICE

- 2021 **Keynote session chair**, Bacterial locomotion and signal transduction meeting.
- 2016 **Member**, *Finance Committee*, Harvard FAS Postdoctoral Association.
- 2014- **Invited reviewer**, *PLOS One*, *eLife*, *Physical Review Letters*, *Nature Communications*, *Proceedings of the National Academy of Sciences*, National Science Foundation, *Physical Review X*, *Physical Review E*, *Frontiers in Marine Science*, *American Naturalist*, *Communications Biology*, *Biomolecules*, *Journal of Physics D*, and *Journal of Experimental Marine Biology and Ecology*.

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## TEACHING EXPERIENCE

- 2020 **Guest lecturer**, *Freshman Seminars: Physics*, Emory University.
- 2014 **Course supervisor**, “*Consulting project*”, Technical University of Denmark.
- 2013–2014 **Teaching Assistant**, *Experimental Methods and Instrumentation in Physics*, Technical University of Denmark.
- 2013, 2014 **Guest lecturer**, *Introduction to Biophysics*, Technical University of Denmark.
- 2013, 2014 **Guest lecturer**, *Physical Oceanography*, Technical University of Denmark.
- 2011 **Guest lecturer**, *Imagination summer camp*, Virginia Tech.
- 2011–2012 **Instructor**, *Foundations of Physics Laboratory*, Virginia Tech.
- 2011 **Teaching Assistant**, *Dynamics*, Virginia Tech.
- 2011 **Instructor**, *Mechanical Behavior of Materials*, Virginia Tech.
- 2010 **Teaching Assistant**, *Statics*, Virginia Tech.

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## TRAINEES

- 2019 **Jinming Yang**, *Visiting student*, Now: PhD student (Yale Physics).
- 2019 **Sophia Belser**, *Visiting student*, Now: MPhil student (Cambridge Biotechnology).
- 2018 **Olenka Jain**, *Undergraduate researcher*, Now: Undergraduate (Harvard Physics).
- 2018 **Daozheng Gong**, *Visiting student*, Now: PhD student (Chicago Biophysics).
- 2017 **Isabel Esain Garcia**, *Visiting student*, Now: PhD student (Cambridge Chemistry).
- 2017-2018 **Siyu He**, *Visiting student*, Now: PhD student (Columbia Biomedical Engineering).
- 2016 **Ying Zuo**, *Visiting student*, Now: PhD student (HKUST).

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## OUTREACH

- 2020 **Judge**, ENVISION proposal-writing competition by *Women in STEM*.
- 2019 **Social media contributor**, *Biophysical Journal*.
- 2017 **Judge**, Massachusetts State Science & Engineering Fair.
- 2014 **Volunteer**, *Science in the City*, EuroScience Open Forum.