

Navish Wadhwa, Ph.D.

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Education and Training

Current	K99 Postdoctoral Fellow Harvard University
2015	Ph.D. in Physics Technical University of Denmark
2012	M.S. in Engineering Mechanics Virginia Polytechnic Institute and State University
2008	B.Tech. in Mechanical Engineering Indian Institute of Technology Delhi

Research Experience

2016 –	Postdoctoral Research , Harvard University Biophysics and mechanobiology of the bacterial flagellar motor Mentors: Dr. Howard Berg and Dr. Ethan Garner
2012-2015	Graduate Research , Technical University of Denmark Physics of swimming and sensing in marine organisms Mentors: Dr. Anders Andersen, Dr. Thomas Kiørboe, Dr. Tomas Bohr
2010-2012	Graduate Research , Virginia Polytechnic Institute and State University Physics of non-coalescence between fluid jets Mentor: Dr. Sunghwan Jung
2008-2010	Junior Research Fellowship , National Centre for Biological Sciences Biomechanics of insect flight Mentor: Dr. Sanjay Sane
2007-2008	Undergraduate Research , Indian Institute of Technology Delhi Computational modeling of microscale flows and bubbles in cardiovascular channels Mentor: Dr. Brijesh Eshpuniyani

Additional Training

2021	The Inclusive STEM Teaching Project (5 weeks) “Lab Dynamics: Management Skills for Scientists”, by Dr. Carl M. Cohen (4 days)
2017	Physiology course, Marine Biological Laboratory (7 weeks) Visiting Scientist with Dr. Jennifer Lippincott-Schwartz, Janelia Research Campus (2 weeks)
2016	Advanced Bacterial Genetics course, Cold Spring Harbor Laboratories (3 weeks)
2014	Particle Image Velocimetry course, German Aerospace Center (4 days)

Research Funding

2020 – 2025	NIH K99/R00 Pathway to Independence, National Institute of General Medical Sciences Identifying the mechanisms of mechanosensing by the bacterial flagellar motor Direct cost: \$950,000, Role: PI
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Honors and Awards

2021	Intersections Science Fellows Symposium Associate
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 Mechanics Society Otto Mønsted Foundation Travel Award (\$1340)
2013	Best Poster Award, Department of Physics, Technical University of Denmark
2012	Otto Mønsted Foundation Travel Award (\$1100)
2010	Milton Van Dyke Award , American Physical Society Division of Fluid Dynamics
2009	Junior Research Fellowship, National Centre for Biological Sciences
2006	Keshar Devi Scholarship, Indian Institute of Technology Delhi

Publications

‡: corresponding author, *: equal contribution

13. Hu, H., Santiveri, M., **Wadhwa, N.**, Berg, H. C., Erhardt, M., & Taylor, N. M. (2021). Structural basis of torque generation in the bi-directional bacterial flagellar motor. *Trends in Biochemical Sciences*.
12. **Wadhwa, N.**[‡], & Berg, H. C.^{*}‡. (2021). Bacterial motility: Machinery and mechanisms. *Nature Reviews Microbiology*.
11. **Wadhwa, N.**[‡], Tu, Y., & Berg, H. C. (2021). Mechanosensitive remodeling of the bacterial flagellar motor is independent of direction of rotation. *Proc. Natl. Acad. Sci.*, 118(15).
10. Santiveri, M., Roa-Eguiara, A., Kühne, C., **Wadhwa, N.**, Hu, H., Berg, H. C., ... Taylor, N. M. (2020). Structure and function of stator units of the bacterial flagellar motor. *Cell*, 183(1), 244–257.e16.
9. **Wadhwa, N.**[‡], Phillips, R., & Berg, H. C. (2019). Torque-dependent remodeling of the bacterial flagellar motor. *Proc. Natl. Acad. Sci.*, 116(24), 11764–11769.
8. Andersen, K. H., Berge, T., Gonçalves, R. J., ... (13 authors), **Wadhwa, N.**, & Kiørboe, T. (2016). Characteristic sizes of life in the oceans, from bacteria to whales. *Annu. Rev. Mar. Sci.*, 8(1), 217–241.
7. Andersen, A., **Wadhwa, N.**, & Kiørboe, T. (2015). Quiet swimming at low reynolds number. *Phys. Rev. E*, 91, 042712.
6. Martens, E. A.^{*}‡, **Wadhwa, N.**^{*}‡, Jacobsen, N. S., Lindemann, C., Andersen, K. H., & Visser, A. (2015). Size structures sensory hierarchy in ocean life. *Proc. R. Soc. B*, 282(1815), 20151346.
5. Kiørboe, T., Jiang, H., Gonçalves, R. J., Nielsen, L. T., & **Wadhwa, N.** (2014). Flow disturbances generated by feeding and swimming zooplankton. *Proc. Natl. Acad. Sci.*, 111(32), 11738–11743.
4. **Wadhwa, N.**[‡], Andersen, A., & Kiørboe, T. (2014). Hydrodynamics and energetics of jumping copepod nauplii and copepodids. *J. Exp. Biol*, 217(17), 3085–3094.
3. **Wadhwa, N.**, Vlachos, P., & Jung, S. (2013). Noncoalescence in the oblique collision of fluid jets. *Phys. Rev. Lett.*, 110, 124502.
2. **Wadhwa, N.**, & Jung, S. (2011). Non-coalescence of jets. *Phys. Fluids*, 23(9), 091105.
1. **Wadhwa, N.**, Jain, V., Fowlkes, J. B., Bull, J. L., & Eshpuniyani, B. (2010). A boundary element model of multiple microcirculatory bubbles in cardiovascular. *Int. J. Emerg. Multidiscip. Fluid Sci.*, 2, 143–160.

Invited Seminars

- 2021 University of California at Merced, Soft, Living, Active and Adaptive Matter seminars
Harvard University, Kavli seminars
École Polytechnique Fédérale de Lausanne, Physics of Living Systems seminars
Microscale Ocean Biophysics seminars
- 2020 Yale Quantitative Biology Institute (cancelled due to Covid-19)
- 2019 Princeton University, Center for the Physics of Biological Function
Brandeis University, Materials Research Science and Engineering Center
- 2018 Brown University, Division of Applied Mathematics Fluids and Thermal Sciences
- 2015 Cambridge Department of Applied Mathematics and Theoretical Physics
Max Planck Institute for Terrestrial Microbiology
- 2014 Harvard School of Engineering and Applied Sciences
- 2012 Jawaharlal Nehru Centre for Advanced Scientific Research

Presentations

- 2021 Gordon Research Conference - Stochastic Physics in Biology, Ventura, CA
American Physical Society March Meeting, virtual
Biophysical Society Meeting, virtual
- 2020 Physics of Living Matter 15, virtual
Gordon Research Conference - Sensory Transduction in Microorganisms, Ventura, CA
- 2019 American Society of Cell Biology Conference, Washington, DC
Bacterial Locomotion and Signal Transduction Conference, New Orleans, LA
- 2017 American Society of Cell Biology Conference, Philadelphia, PA
Bacterial Locomotion and Signal Transduction Conference, New Orleans, LA
- 2014 American Physical Society's Division of Fluid Dynamics Meeting, San Francisco, CA
European Fluid Mechanics Conference, Kgs. Lyngby, Denmark
Active Fluids Workshop, Mariehamn, Åland
- 2013 International workshop on Trait-based approaches to Ocean Life, Copenhagen, Denmark
Complex Motion in Fluids Summer School, Humlebæk, Denmark
Microscale interactions in aquatic environments, Les Houches, France
- 2012 American Physical Society's Division of Fluid Dynamics Meeting, San Diego, CA
- 2011 American Physical Society's Division of Fluid Dynamics Meeting, Baltimore, MD

Teaching

- 2020 Guest lecturer, *Freshman Seminars: Physics*, Emory University
- 2014 Instructor, "Consulting project", Technical University of Denmark
Teaching Assistant, *Experimental Methods and Instrumentation in Physics*, Technical University of Denmark
- 2013 Guest lecturer, *Introduction to Biophysics*, Technical University of Denmark
Guest lecturer, *Physical Oceanography*, Technical University of Denmark
- 2012 Instructor, *Foundations of Physics Laboratory*, Virginia Tech
- 2011 Instructor, *Mechanical Behavior of Materials*, Virginia Tech

Teaching (continued)

- Teaching Assistant, *Dynamics*, Virginia Tech
2010 Teaching Assistant, *Statics*, Virginia Tech

Mentoring

- 2019 Jinming Yang (visiting student). After: Ph.D. student at Yale U., Physics
Sophia Belser (visiting student). After: M.Phil. student at U. Cambridge, Biotechnology
2018 Olenka Jain (undergraduate researcher). After: Ph.D. student at Princeton U., Quantitative and Computational Biology
Daozheng Gong (visiting student). After: Ph.D. student at U. Chicago, Biophysics
Siyu He (visiting student). After: Ph.D. student at Columbia U., Biomedical Engineering
2017 Isabel Esain Garcia (visiting student). After: Ph.D. student at U. Cambridge, Chemistry
2016 Ying Zuo (visiting student). After: Ph.D. student at Hong Kong U. Sci. Tech.

Service and outreach

- 2021- Community task force on diversity, inclusion and belonging, MCB Harvard
Website and Public Relations Committee, MCB Harvard
2021 American Physical Society DBIO tweetorial, “A bio-nanomachine that never ceases to amaze”
Keynote Session Chair, Bacterial locomotion and signal transduction meeting
2020 Judge, ENVISION (proposal-writing competition for high-school girls, organized by Women in STEM)
2019 Social media contributor, Biophysical Journal
2017 Judge, Massachusetts State Science & Engineering Fair
Panelist, Harvard iGEM club, SynBio Research Panel
2016 Finance committee, Harvard FAS postdoctoral association
2014 Volunteer, Science in the City (science festival organized by EuroScience Open Forum)
2011 Volunteer, ‘Imagination Camp’ (STEM outreach program at Virginia Tech, targeted at middle-school students)
2014- 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*, *The American Naturalist*, *Communications Biology*, *Biomolecules*, *Journal of Physics D*, and *Journal of Experimental Marine Biology and Ecology*