

ARVIND SANTHANAKRISHNAN, Ph.D.

ASSOCIATE PROFESSOR, SCHOOL OF MECHANICAL & AEROSPACE ENGINEERING
 OKLAHOMA STATE UNIVERSITY
www.appliedfluidslab.org

EDUCATION

- Ph.D., Mechanical Engineering, University of Kentucky, Lexington, KY, USA (2007)
- B.E., Mechanical Engineering, Bharathidasan University, Tiruchirapalli, India (2002)

PROFESSIONAL EXPERIENCE

- Associate Professor (with tenure; 07/2019–present)
 Assistant Professor (08/2013–06/2019)
 School of Mechanical & Aerospace Engineering, Oklahoma State University, Stillwater, OK, USA
- American Heart Association Postdoctoral Fellow (07/2012–07/2013)
 Postdoctoral Fellow (09/2010–06/2012)
 Wallace H. Coulter Department of Biomedical Engineering
 Georgia Institute of Technology & Emory University, Atlanta, GA, USA
Advisor: Prof. Ajit P. Yoganathan, Regents Professor Emeritus
- Visiting Faculty (01/2009–08/2010)
 Postdoctoral Fellow (10/2007–08/2010)
 Department of Mathematics, University of North Carolina (UNC) at Chapel Hill, NC, USA
Advisor: Prof. Laura A. Miller, Professor, Dept. of Mathematics, University of Arizona (formerly at UNC)
- Instructor (01/2007–08/2007, 06/2006–08/2006)
 Graduate Research Assistant (08/2003–07/2007)
 Graduate Teaching Assistant (01/2004–05/2005)
 Department of Mechanical Engineering, University of Kentucky, Lexington, KY, USA

RESEARCH INTERESTS

Biological fluid mechanics; Bio-inspired design; Fluid-Structure Interaction; Flow control; Medical device design

SELECT AWARDS & HONORS

- *Carroll M. Leonard Fellow in Mechanical Engineering*, College of Engineering, Architecture, and Technology (CEAT), Oklahoma State University (OSU), 3-year term (2018)
- *CEAT Outstanding Faculty Award*, OSU (2017)
- *Greater Southeast Affiliate Postdoctoral Fellowship*, American Heart Association (2012)

SELECT PUBLICATIONS[†]

- Graduate advisees **highlighted**; undergraduate advisees **highlighted & underlined**.
- **Kasoju, V. T.**, Moen, D. S., **Ford, M. P.**, **Ngo, T. T.** and **Santhanakrishnan, A.** (2021). Interspecific variation in bristle number on forewings of tiny insects does not influence clap-and-fling aerodynamics. To appear in *Journal of Experimental Biology*. doi: 10.1242/jeb.239798.

[†]Full list: www.appliedfluidslab.org/publications

- **Ford, M. P.**, Ray, W. J., **DiLuca, E. M.**, Patek, S. N. and **Santhanakrishnan, A.** (2021). Hybrid metachronal rowing augments swimming speed and acceleration via increased stroke amplitude. To appear in *Integrative & Comparative Biology*. doi: [10.1093/icb/icab141](https://doi.org/10.1093/icb/icab141).
- **Ford, M. P.** and **Santhanakrishnan, A.** (2021). Closer appendage spacing augments metachronal swimming speed by promoting tip vortex interactions. To appear in *Integrative & Comparative Biology*. doi: [10.1093/icb/icab112](https://doi.org/10.1093/icb/icab112).
- **Ford, M. P.** and **Santhanakrishnan, A.** (2021). On the role of phase lag in multi-appendage metachronal swimming of euphausiids. To appear in *Bioinspiration & Biomimetics*. doi: [10.1088/1748-3190/abc930](https://doi.org/10.1088/1748-3190/abc930).
- **Kasoju, V. T.** and **Santhanakrishnan, A.** (2021). Aerodynamic interaction of bristled wing pairs in fling. *Physics of Fluids* **33**(3): 031901. doi: [10.1063/5.0036018](https://doi.org/10.1063/5.0036018). (Invited paper; selected as “Editor’s Pick”)
- **Ford, M. P.**, **Lai, H. K.**, **Samaee, M.** and **Santhanakrishnan, A.** (2019). Hydrodynamics of metachronal paddling: effects of varying Reynolds number and phase lag. *Royal Society Open Science* **6**: 191387. doi: [10.1098/rsos.191387](https://doi.org/10.1098/rsos.191387).

RECENT RESEARCH FUNDING

- CDC contract no. 75D30121C10674: *Flow control strategies for protection of aircraft passengers and workers against SARS-CoV-2* (PI); Awarded amount: \$301,292 (total face value: \$393,687); Performance period: 03/31/2021–03/30/2023; Collaborators: Jamey Jacob & Yu Feng (OSU), Changjie Cai (Univ. of Oklahoma).
- NSF CBET 1916061: *Collaborative Research: The leaky rake to solid plate transition on flow through biological filtering structures* (PI); Awarded amount: \$212,000 (total face value: \$501,368); Performance period: 07/15/2019–06/30/2022; Collaborators: Laura Miller (Univ. of Arizona), Christina Hamlet (Bucknell Univ.).
- NSF CBET 1706762: *Collaborative Research: The Roles of Inter-limb Jets and Body Angles in Metachronal Paddling* (PI); Awarded amount: \$254,000 (total face value: \$504,015); Performance period: 09/01/2017–08/31/2022; Collaborators: Donald Webster & Jeannette Yen (Georgia Tech).
- NSF CBET 1512071: *UNS: Collaborative Research: Role of Bristled Wings for Flying and Swimming at Low Reynolds Numbers* (PI); Awarded amount: \$236,150 (total face value: \$449,775); Performance period: 07/01/2015–06/30/2020; Collaborators: Laura Miller (Univ. of Arizona), Tyson Hedrick & Boyce Griffith (UNC).

SYNERGISTIC ACTIVITIES

- Graduate student advising at OSU: 6 Ph.D. (5 completed) & 8 M.S. students (6 completed).
- 84 undergraduate students mentored for research (40 at OSU). Outcomes include: 15 conference presentations; 9 co-authored refereed journal articles.
- Preservice Science Teacher (PST) mentor, OSU (01/2015 – present). Mentored 5 PSTs (including 3 women) to develop standards-based inquiry science lesson plans based on semester-long research projects.
- New lab development for immersive learning in undergraduate courses: *Experimental Fluid Dynamics* (senior-level); *Fluid Mechanics* (sophomore-level); *Fluids and Hydraulics Lab* (sophomore-level).
- Co-organized invited symposium on “Metachronal coordination of multiple appendages for swimming and pumping” at the *Society for Integrative and Comparative Biology (SICB) Annual Meeting*, January 3-7, 2021, Washington, DC.
- Co-organized invited minisymposium and focus session on “Life processes at biologically intermediate Reynolds numbers” at the *70th Annual Meeting of the American Physical Society Division of Fluid Dynamics (APS-DFD)*, November 19–21, 2017, Denver, CO.