Vivek N. Prakash, Ph.D.

Assistant Professor
Department of Physics
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Professional Profiles
Google Scholar, ORCID, LinkedIn, Twitter/X, BlueSky

Faculty Appointments

Assistant Professor, University of Miami, FL (Tenure-Track) (01/2020 – Present)

Department of Physics, College of Arts & Sciences

Secondary Faculty Appointments, University of Miami, FL

- Department of Biology, College of Arts & Sciences
- Department of Marine Biology & Ecology
  Rosenstiel School of Marine, Atmospheric, and Earth Science

Affiliated Faculty Appointments, University of Miami, FL

- Dr. John T. Macdonald Foundation Biomedical Nanotechnology Institute (BioNIUM)
- Frost Institute for Data Science & Computing (IDSC)
- Glassell Family Center for Marine Biomedicine, Rosenstiel School

Education

Postdoc. Bioengineering	Stanford University, CA	2019
Embryology Course	Marine Biological Laboratory, MA	2019
Ph.D. Applied Physics	University of Twente, The Netherlands	2013
M.S. Engineering Mechanics	JNCASR, India	2009
B.E. Mechanical Engineering	R.V. College of Engineering, India	2007

Research Appointments

- **Postdoctoral Research Fellow, Stanford University, CA** (2014 – 2019)
  Department of Bioengineering, Schools of Engineering & Medicine
  Advisor: Prof. Manu Prakash, *Collaborator:* Prof. Takashi Mikawa (UCSF)
- **Ph.D. Candidate, University of Twente, The Netherlands** (2009 – 2013)
  Physics of Fluids group, *Advisors:* Prof. Detlef Lohse & Prof. Chao Sun
  Ph.D. Thesis: "Light particles in turbulence"
  Committee: Dr. Mickael Bourgoin (ENS de Lyon, France), Prof. Federico Toschi (TU Eindhoven)
- **M.S. Candidate, JNCASR, India** (2007 – 2009)
  Summer Undergraduate Research Fellow (2005 – 2006)
  Engineering Mechanics Unit, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR)
  Advisors: Prof. K. R. Sreenivas (JNCASR) & Prof. J. H. Arakeri (Indian Institute of Science)
  M.S. Thesis: "An experimental study of mantle convection"

Research Interests

- **Biological Fluid Mechanics** – Swimming, feeding, and transport processes in marine invertebrates, and applications to their physiology, ecology and toxicology
- **Biophysics** – Tissue- to organism-scale mechanics, including cell rearrangements, morphogenesis, and developmental processes
- **Environmental Biophysics** – Flow–chemistry interactions and engineered microenvironments for organismal survival, with applications to coral systems and reef restoration
- **Fluid Dynamics and Soft Active Matter** – Kitchen flows, particle-laden flows, turbulence

Publications

Key Metrics

- **Total Citations:** >940, **h-index:** 13, Google Scholar Profile
- **Peer-Reviewed Publications:** 23, in leading journals across physics, biology, interdisciplinary science

Representative Journals by Field:

- **Multidisciplinary Science:** *Nature Communications* (1), *Proceedings of the National Academy of Sciences (PNAS)* (1)
- **Physics – Multidisciplinary:** *Reviews of Modern Physics* (1), *Nature Physics* (3), *Physical Review Letters* (1), *New Journal of Physics* (1)
- **Physics – Fluids:** *Journal of Fluid Mechanics* (3), *Physics of Fluids* (1), *Physical Review Fluids* (1)
- **Engineering:** *Chemical Engineering Science* (1), *HardwareX* (1)
- **Biology – Cell, Developmental & Zoology:** *eLife* (1), *Journal of Cell Science* (1), *Journal of Experimental Biology* (1), *Integrative & Comparative Biology* (1), *Developmental Biology* (1), *Cytologia* (1)
- **Geosciences – Multidisciplinary, Environmental Sciences:** *Communications Earth & Environment* (1)
- **Marine & Freshwater Biology:** *Coral Reefs* (1)

Faculty career at the University of Miami, (2020–Present)

Bold underline indicates **Vivek N. Prakash** as senior corresponding author

Trainees indicated by symbols: ⋆⋆undergraduate, ⋆graduate, †postdoc, ‡Equal contribution

Publications under revision/review:

13. Bikram Shrestha⋆‡, Santhan Chandragiri†‡, Christian D. Gibson⋆⋆, Nina R. Couture⋆⋆, Melissa Ruszczyk†, and **Vivek N. Prakash**
A universal hydrodynamic transition in confined marine invertebrate larvae
Nature Communications (under revision) (2026) (arXiv preprint)

12. Abigail Descoteaux, Alexandra T. Lion, Santhan Chandragiri†, Deema Abayawardena, Bikram D. Shrestha⋆, Athula H. Wikramanayake, **Vivek N. Prakash**, and Cynthia A. Bradham
Alizarin red perturbs skeletal patterning and biomineralization via Catalase inhibition
Development (under revision) (2026) (bioRxiv preprint)

Publications (peer-reviewed):

11. Melissa Ruszczyk†‡, Skylar Rodriguez‡, Montale Tuen, Kylee Rux, Veronica Paul, Santhan Chandragiri†, Maren Stickley, Peter K. Swart, Brian K. Haus, Andrew C. Baker, Margaret W. Miller, Prannoy Suraneni, Chris Langdon#, and **Vivek N. Prakash**, *Alkalinity-enhanced artificial substrates modulate local pH and increase survivorship of early-stage coral recruits*
Communications Earth & Environment, 7, 311 (2026)

    - **Editor-Selected Featured Article**, Communications Earth & Environment (2026) (2026)

10. Juyeon Hong, Chanjae Lee, Gopika Madhu⋆, Ophelia Papoulas, Ece Atayeter, Garbiel Hoogerbrugge, Jiehong Pan, Maki Takagishi, Nadia Manzi, Daniel J. Dickinson, Amjad Horani, Steven L. Brody, Edward Marcotte, **Vivek N. Prakash**, Tae Joo Park, and John B. Wallingford, *A protein complex in the extreme distal tip of vertebrate motile cilia controls their organization, length, and function*
Nature Communications, 17, 394 (2026)

9. Patrick M. Kiel⋆, Matthew McConnell, Albert Boyd, Nash Soderberg, Prannoy Suraneni, **Vivek N. Prakash**, and Ian C. Enochs, *Electrochemically Induced Alkalinity Enhancement Increases Coral Growth Rates in the Local Microenvironment*, **Coral Reefs**, 45, 737–752 (2026)

8. Melissa Ruszczyk†, Patrick M. Kiel⋆, Santhan Chandragiri†, Cedric M. Guigand, Johnnie Xia⋆⋆, Owen Brown⋆⋆, Brian K. Haus, Andrew C. Baker, Margaret W. Miller, Prannoy Suraneni, Chris Langdon, and **Vivek N. Prakash**
FlumeX: A Modular Flume Design for Laboratory-Based Marine Fluid-Substrate Studies
HardwareX, 24, e00697 (2025)

7. Rieko Asai#, Shubham Sinha⋆, **Vivek N. Prakash**#, and Takashi Mikawa#
Live-imaging with quantitative analysis of cellular flows to visualize left-right asymmetry during early chick embryo development, **Cytologia**, 90(3), 145-146 (2025)
#corresponding authors

    - **Cover** of Cytologia (09/2025)

6. Alexandra T. Lion, Sophie M. Bodine, Kelley R. McCutcheon, Mayank Ghogale, Santhan Chandragiri†, Deema Abayawardena, Bikram D. Shrestha⋆, Abigail Descoteaux, Kathryn Alvarez⋆⋆, J'nesse A. Balkman⋆⋆, Breelyn Cocke⋆⋆, Athula H. Wikramanayake, Jennifer Schlezinger, Joyce Y. Wong, **Vivek N. Prakash**, and Cynthia A. Bradham
PFAS Compounds PFOA and Gen X are Teratogenic to Sea Urchin Embryos
Developmental Biology, 525, 139-154 (2025)

    - **Cover** of Developmental Biology (09/2025)

5. Rieko Asai‡, Shubham Sinha‡⋆, **Vivek N. Prakash**, and Takashi Mikawa
Bilateral cellular flows display asymmetry prior to left–right organizer formation in amniote gastrulation
Proceedings of the National Academy of Sciences (PNAS), 122 (6), e2414860122 (2025)

4. Rieko Asai, **Vivek N. Prakash**, Shubham Sinha⋆, Manu Prakash, and Takashi Mikawa
Coupling and uncoupling of midline morphogenesis and cell flow in amniote gastrulation
eLife, 12:RP89948 (2023)

3. Setareh Gooshvar⋆⋆‡, Gopika Madhu⋆‡, Melissa Ruszczyk†, and **Vivek N. Prakash**
Non-bilaterians as Model Systems for Tissue Mechanics
Integrative and Comparative Biology, 63, 6, 1442-1454 (2023)

2. Arnold J. M. Mathijssen#, Maciej Lisicki#, **Vivek N. Prakash**#, and Endre J. L. Mossige#
Culinary fluid mechanics and other currents in food science
Reviews of Modern Physics, 95, 025004 (2023)
#corresponding authors

    - Featured in **Physics**, Q&A: From Whiskey to Oreos (2023)

1. Mia J. Konjikusic, Chanjae Lee, Yang Yue, Bikram D. Shrestha⋆, Ange M. Nguimtsop, Amjad Horani, Steven Brody, **Vivek N. Prakash**, Ryan S. Gray, Kristen J. Verhey, John B. Wallingford
Kif9 is an active kinesin motor required for ciliary beating and proximodistal patterning of motile axonemes
Journal of Cell Science, 136 (5) (2023)

Publications (not peer-reviewed):

Viewpoints, Commentaries, News and Views (Invited)

7. **Vivek N. Prakash**, *How Corals Stir Seawater*
Physics, 19, 76 (2026)
6. **Vivek N. Prakash**, *A crowd of marine embryos self-assembles into a living solid*
Nature Physics, 22, 346–347 (2026)
5. Patrick M. Kiel⋆, and **Vivek N. Prakash**
Coral physiology: Going with the ciliary flow
Current Biology, 32(19), pp.R998-R1000 (2022)

Journal Editorial

4. Gerald G. Fuller, Maciej Lisicki, Arnold JTM Mathijssen, Endre JL Mossige, Rossana Pasquino, **Vivek N. Prakash**, and Laurence Ramos
Kitchen flows 2024: New research directions and culinary applications
Physics of Fluids, (2026) (accepted, in press)

3. Gerald G. Fuller, Maciej Lisicki, Arnold JTM Mathijssen, Endre JL Mossige, Rossana Pasquino, **Vivek N. Prakash**, and Laurence Ramos
Kitchen flows: Making science more accessible, affordable, and curiosity driven
Physics of Fluids, 34, no. 11: 110401 (2022)

Conference Proceedings

2. Gopika Madhu⋆, Molly McCord, Jonah Spencer, Katherine Kafkis, Jacob Notbohm, and **Vivek N. Prakash**
Quantifying Ciliary-generated Traction Forces during Locomotion in a Simple Marine Animal's Epithelial Tissues, **In SEM Annual Conference and Exposition on Experimental and Applied Mechanics**, pp. 83-88. Cham: Springer Nature Switzerland (2024)

Other Articles

1. Jenna Efrein, Carolyn (Jack) Delli-Santi⋆⋆, and **Vivek N. Prakash**
Glass, Marine Biology, & Physics (Lecture and Demo)
Glass Art Society Journal, Pages 49-51 (2023) **[pdf copy]**

Pre-Faculty Publications (pre-2020)

Postdoctoral Research: Organismal Biophysics

12. **Vivek N. Prakash**, M. S. Bull and M. Prakash
Motility-induced fracture reveals a ductile-to-brittle crossover in a simple animal's epithelia
Nature Physics, 17, 504–511 (2021)

11. W. Gilpin, **Vivek N. Prakash**, and M. Prakash
Dynamic vortex arrays created by starfish larvae
Physical Review Fluids, 2, 090501 (2017)

10. W. Gilpin, **Vivek N. Prakash**, and M. Prakash
Flowtrace: a simple visualization tool for biological fluid flows
Journal of Experimental Biology, 220, 3411-3418 (2017)

    - **Cover** of Journal of Experimental Biology (Volume 220, 2017)

9. W. Gilpin, **Vivek N. Prakash**, and M. Prakash
Vortex arrays and ciliary tangles underlie the feeding-swimming tradeoff in starfish larvae
Nature Physics, 13, 380-386 (2017)

    Highlights and media attention:
    - **Nature Physics News** & **Views**:
    V. I. Fernandez & R. Stocker, Hydrodynamics: Modus vivendi, Nature Physics, 13, 326-327 (2017)
    - **Nature Physics Editorial** article: A ton for Thompson's tome, Nature Physics 13, 315 (2017)
    - Featured in Principles of Systems Biology, No.15, **Cell Systems**, 4, 252-254 (2017)
    - Featured in **Physics Today** Magazine: 'Biological eigenstrokes', Physics Today 70, 3, 84 (2017)
    - APS/DFD 'Milton van Dyke Award' (Video) (2016)
    - 'First place', Nikon Small World in Motion Competition (2016)
    - 'Image of distinction', Nikon Small World Photomicrography Competition (2016)
    - 'Expert's Choice award', NSF "Vizzies" Visualization challenge (2017)
    - Featured in New York Times, Nature, CBS News, Scientific American, Popular Science and others (2016, 2017)

8. W. Gilpin, **Vivek N. Prakash**, and M. Prakash
Reply to 'Boundary effects on currents around ciliated larvae'
Nature Physics, 13, 521-522 (2017)

Graduate Research: Fluid Mechanics, Multi-phase Turbulent Flows

7. **Vivek N. Prakash**, J. M. Mercado, L. van Wijngaarden, E. Mancilla, Y. Tagawa, D. Lohse, and C. Sun
Energy spectra in turbulent bubbly flows
Journal of Fluid Mechanics, 791, 174-190 (2016)

6. V. Mathai, **Vivek N. Prakash**, J. Brons, C. Sun and D. Lohse
Wake-driven dynamics of finite-sized buoyant spheres in turbulence
Physical Review Letters, 115, 124501 (2015)

5. Y. Tagawa, I. Roghair, **Vivek N. Prakash**, M. van Sint Annaland, H. Kuipers, C. Sun, and D. Lohse
The clustering morphology of freely rising deformable bubbles
Journal of Fluid Mechanics, 721, R2 (2013)

4. **Vivek N. Prakash**, Y. Tagawa, E. Calzavarini, J. M. Mercado, F. Toschi, D. Lohse, and C. Sun
How gravity and size affect the acceleration statistics of bubbles in turbulence
New Journal of Physics, 14, 105017, (2012)
(co-corresponding author)
    - Featured in New Journal of Physics 'Research Highlights' collection - 2012, 2013
    - Part of New Journal of Physics focus issue on 'Dynamics of Particles in Turbulence' - 2013
    - New Journal of Physics Video Abstract Prize - 2013

3. J. M. Mercado, **Vivek N. Prakash**, Y. Tagawa, C. Sun, and D. Lohse
Lagrangian statistics of light particles in Turbulence
Physics of Fluids, 24, 055106 (2012)
(co-corresponding author)

2. Y. Tagawa, J. M. Mercado, **Vivek N. Prakash**, E. Calzavarini, C. Sun, and D. Lohse
Three-dimensional Lagrangian Voronoi analysis for clustering of particles and bubbles in turbulence
Journal of Fluid Mechanics, 693, 201-215 (2012)

1. **Vivek N. Prakash**, K. R. Sreenivas, and J. H. Arakeri
The role of viscosity contrast on plume structure in laboratory modeling of mantle convection
Chemical Engineering Science, 158, 245-256 (2017)

Research Funding

Total Funding Awarded: >$787,000

External Funding (Total: >$615,000)

- **2025–2027 – NIH BRAIN Initiative (R34) – Co-Investigator**
Quantifying Organism–Environment Interactions in a New Model System for Neuroscience
National Institutes of Health – Brain–Behavior Quantification and Synchronization: Transformative and Integrative Models of Behavior at the Organismal Level
Total Award: $754,000 **Prakash Share:** $165,000
PI: Prof. Mansi Srivastava (Harvard University) Co-I: Vivek N. Prakash
- **2024–2026 – NSF REU Site – Co-Principal Investigator**
Championing Physics in Multicultural Miami: Dismantling Barriers for New Research Perspectives
National Science Foundation, Division of Mathematical and Physical Sciences
Total Award: $429,809
PI: Prof. Olga Korotkova (UM Physics) Co-PI: Vivek N. Prakash
- **2022–2024 – DARPA Biological Technologies Office – Co-Principal Investigator**
Next Generation Reef Engineering to Enhance Future Structures (X-REEFS)
Defense Advanced Research Projects Agency (DARPA), Biological Technologies Office
Large multi-institutional project with 28 PIs nationwide (UM RSMAS, Penn State, UC Santa Cruz, SECORE, The Nature Conservancy, Johns Hopkins APL, Texas A&M, University of Florida, Smithsonian Marine Station, Florida Aquarium, Florida International University)
Total Award: $24.2M **Prakash Share:** $450,000
PI: Prof. Andrew Baker (UM RSMAS) Co-PI: Vivek N. Prakash

Internal Funding (University of Miami): (Total: >$237,800)

- **2026–2027 – Glassell Family Center for Marine Biomedicine Transdisciplinary Pilot Award – PI**
Hydrocarbon-Induced Ciliary Dysfunction and Disease Pathways
Award: $30,000
PI: Vivek N. Prakash Co-PI: Prof. Athula Wikramanayake (UM Biology), Prof. Rachael Heuer (UM MBE, Rosenstiel School)
- **2026–2027 – Provost's Research Award – PI**
Improving Coral Larval Recruitment using Biophysics and Engineering
Award: $32,300
PI: Vivek N. Prakash Co-PI: Prof. Prannoy Suraneni (UM Civil Engineering)
- **2026 – OVPRS Publications Award for U – PI**
Local alkalinity enhancement using artificial substrates increases survivorship of early-stage coral recruits
Award: $3,490
PI: Vivek N. Prakash

- **2024 – Frost Institute for Data Science & Computing (IDSC) – PI**
  Machine Learning for Prediction of Microswimmer Trajectories
  Collaborative project with UM RSMAS
  Award: $20,000
  PI: Vivek N. Prakash Co-PI: Prof. Ben Kirtman (UM RSMAS)
- **2024–2025 – U-LINK AI Initiative – Co-PI**
  Improving Coral Larval Recruitment Using Engineering, Biophysics, and Generative AI
  Interdisciplinary collaboration across multiple UM schools
  Total Award: $99,921 **Prakash Share:** $50,000
  PI: Prof. Prannoy Suraneni (UM Civil Engineering) Co-PI: Vivek N. Prakash
- **2023 – OVPRS Junior Faculty Research Award – PI**
  Quantifying Fluid Flows and Alkalinity Surrounding Coral Settlement
  Award: $5,000
  PI: Vivek N. Prakash
- **2023–2024 – U-LINK Resilience Challenge (Renewal) – Co-PI**
  Engineering Corals for Climate Change Resilience
  Interdisciplinary collaboration across UM schools
  Total Award: $99,896 **Prakash Share:** $40,000
  PI: Prof. Prannoy Suraneni (UM Civil Engineering) Co-PI: Vivek N. Prakash
- **2022 – U-LINK Resilience Challenge (Initial Award) – Co-PI**
  Engineering Corals for Climate Change Resilience
  Total Award: $99,160 **Prakash Share:** $40,000
  PI: Prof. Prannoy Suraneni (UM Civil Engineering) Co-PI: Vivek N. Prakash
- **2021–2022 – Provost's Research Award – PI**
  Ciliary-Driven Flows During Development in Marine Invertebrates
  Award: $17,000
  PI: Vivek N. Prakash

Honors & Awards

University of Miami

- **2024 – Winner, Provost's Award for Collaborative Teaching** *(highest institutional teaching honor)*
- 2024 – Finalist, James M. Tien Early Career Award and Grant *(premier UM early-career faculty award)*
- 2024, 2023 – Finalist, Provost's Award for Discussion-Based Learning *(highest inst. teaching honor)*
- **2026, 2021 – Winner, Provost's Research Award** *(competitive internal research grant for faculty)*

National & International Recognition

- **2022 – Choose Development! Mentor Award**, Soc. of Dev. Biology *(national mentorship recognition)*
- **2017 – Expert's Choice Award**, NSF "Vizzies" Visualization Challenge *(national sci. comm. award)*
- **2016 – Milton van Dyke Award**, American Physical Society – Division of Fluid Dynamics *(prestigious APS award for outstanding research and visualization)*
- **2016 – First Place**, Nikon Small World in Motion Competition *(international imaging competition)*
- 2016 – Image of Distinction, Nikon Small World Photomicrography Competition
- 2015 – Honorable Mention, Nikon Small World in Motion Competition

- **2013 – Video Abstract Prize**, *New Journal of Physics (global public voting)*
- 2012, 2013 – Research Highlights, *New Journal of Physics (editor-selected top papers)*
- 2012 – Jury's Choice Poster Award, Hands-On Research in Complex Systems School (China)

Fellowships, Scholarships & Academic Distinctions

- 2019 – Max M. Burger Endowed Scholarship, MBL Embryology Course
- 2019 – Patricia A. Case Endowed Scholarship, MBL Embryology Course
- 2008 – Marie Curie Scholarship (EU) – Euromech Fluid Mechanics Conference, UK
- 2007–2009 – Graduate Scholarship, JNCASR, Dept. of Science & Technology, Govt. of India
- 2007 – Selected Delegate, International Astronautical Congress (IAC) *(ISRO National Selection)*
- **2007 – Best Outgoing Student Award**, Mechanical Engineering, RVCE (Cognizant Technology Solutions) *(Undergraduate)*
- **2006 – LG Electronics Potential Manager Award**, Best Student in Mechanical Engineering, RVCE *(Undergraduate)*
- **2005, 2006 – Summer Research Fellowship**, JNCASR *(Undergraduate)*
- 2005 – Diploma in Space Sciences (Honors), Indian Space Research Organization (ISRO)
- 2003 – Youth Leadership Award, Global Young Leaders Conference (Washington D.C. & NYC, USA)
- 2002 – National Finalist, Intel Science Talent Discovery Fair (ISTDF)

Mentored Students – Honors & Awards

- **Physics Undergraduate Research Fund**, Department of Physics, UM *(Emma Nance, Kieran O' Grady, Undergraduate Students)* (2026)
- **2nd Prize, Poster Award (Biological Sciences)**, Graduate Student & Postdoc Research Symposium, UM *(Christopher Roden, Graduate Student)* (2026)
- **Mastriani Research Award**, UM Rosenstiel School *(Ambar Condori-Boughton, Undergraduate Student)* (2025)
- **Selected for NSF-PoLS Scientific Programming Bootcamp**, Emory University *(Gopika Madhu, Graduate Student)* (2025)
- **Graduate Student Award**, Department of Physics, UM *(Shubham Sinha, Graduate Student)* (2025)
- **Summer Micro-Grants**, Graduate School, UM *(Shubham Sinha, Gopika Madhu, Graduate Students)* (2025)
- **French-American Doctoral Exchange (FADEX) Grant in Ocean Science** *(Patrick Kiel, Graduate Student)* (2025)
- **Best Poster Prize (Biophysics/Medical Physics/Climate Physics)**, APS CUWiP Conference, UC San Diego *(Breelyn Cocke, REU Student at UM, Northern Arizona University)* (2025)
- **NSF Graduate Research Fellowship Program (GRFP)** *(Ivan Levkovsky, Undergraduate Student)* (2025)
- **Interdisciplinary Research Assistantship**, College of Arts & Sciences, UM *(Christopher Roden, Graduate Student)* (2025)
- **Angelo Family Foundation Scholarship**, UM *(Ambar Condori-Boughton, Undergraduate Student)* (2025)
- **1st Prize, Poster Award**, EnvisionU Research Symposium, UM *(Inge Brijker, Undergraduate Student)* (2024)

- **1st Prize, Poster Award (Physical Sciences & Engineering)**, Graduate Student & Postdoc Research Symposium, UM *(Dr. Melissa Ruszczyk, Postdoc)* (2024)
- **Dean's Summer Research Fellowship**, College of Arts & Sciences, UM *(Shubham Sinha, Graduate Student)* (2024)
- **NSF GRFP – Honorable Mention** *(Ivan Levkovsky, Undergraduate Student)* (2024)
- **Early Career Award**, Frost Institute for Data Science & Computing, UM *(Dr. Santhan Chandragiri, Postdoc)* (2023)
- **NSF Graduate Research Fellowship Program (GRFP)** *(Patrick Kiel, Graduate Student)* (2023)
- **Beyond the Books Scholarship**, UM *(Johnnie Xia, Inge Brijker, Undergraduate Students)* (2023)
- **NOAA Ernest F. Hollings Scholarship** *(Leah Henseler, Undergraduate Student)* (2023)
- **Choose Development! Fellow Award**, Society of Developmental Biology (SDB) *(Amaya Crichton, Undergraduate Student)* (2022)
- **FGLSAMP Scholar Award**, NSF FGLSAMP Program *(Christian D. Gibson, Valentina Restrepo, Undergraduate Students)* (2022)
- **Academic Enhancement Research Fellowship**, UM *(Samantha Levine, Undergraduate Student)* (2022)

Advanced Research Training, Schools & Professional Courses

- **2021 – Field Experience: R/V *Western Flyer***, Monterey Bay Aquarium Research Institute (MBARI), CA. Mid-water deep-sea expedition in the Pacific Ocean. Collaborator: Dr. Kakani Katija. Participated in Remotely Operated Vehicle (ROV) surveys and imaging, and invertebrate animal collection.
- **2020 – APS-AAPT Workshop for New Physics and Astronomy Faculty** (Online)
  American Physical Society / American Association of Physics Teachers
- **2020 – 8th Boot Camp for New Faculty** (Online)
  Society for Developmental Biology
- **2019 – Embryology: Concepts & Techniques in Modern Developmental Biology** (6 weeks)
  Marine Biological Laboratory (MBL), Woods Hole, MA
- **2018 – Cilia in Evolution, Development and Human Health** (1 week)
  Stanford University, CA
- **2015 – Developmental Biology in the Ocean** (3 weeks)
  Hopkins Marine Station, Stanford University, CA
- **2015 – Preparing for Faculty Careers** (2 weeks)
  Stanford University, CA
- **2012 – Hands-On Research in Complex Systems School** (2 weeks)
  Shanghai Jiao Tong University, Shanghai, China
- **2012 – New Challenges in Turbulence Research II** (1 week)
  École de Physique des Houches, Les Houches, France
- **2010 – Tutorial School on Fluid Dynamics: Topics in Turbulence** (2 weeks)
  University of Maryland, College Park, MD
- **2010 – J.M.B.C. Advanced Courses: Experimental Techniques (UTwente) & PIV (TUDelft)** (1 week)
  The Netherlands

Invited Keynote and Plenary Talks

Keynote Talks at Professional Conferences

- **Keynote Lecturer** – 35th Biofrontier Symposium, Annual Meeting of the BioEngineering Division (BED), Japanese Society of Mechanical Engineers (JSME), Yokohama National University, Japan; Dec 14–15, 2024
- **Keynote Speaker** – Association of Nepali Physicists in America (ANPA) Annual Conference, Miami, FL; Jul 14–16, 2023

Keynote Talks (Public lecture)

- **Keynote Speaker** – "An Evening of Discovery", Leonardo da Vinci – 500 Years of Genius, Annual fundraiser event, The Phillip and Patricia Frost Museum of Science, Miami, FL; Nov 6, 2025

Plenary/Invited Talks at Professional Conferences

- **Plenary Speaker** – International Conference of the Developmental Biology of the Sea Urchin and Other Marine Invertebrates, Marine Biological Laboratory, Woods Hole, MA; Apr 2–5, 2025
- **Invited Speaker** – "Fracture Across Fields: Insights from Materials Science, Biology, and Geophysics," Princeton Center for Theoretical Sciences (PCTS) Workshop, Princeton University, NJ; May 8–10, 2024
- **Invited Speaker** – American Physical Society (APS) March Meeting, Biological Fluid Dynamics Session, Minneapolis, MN; Mar 14–18, 2024
- **Invited Speaker** – 13th International Symposium on the Mechanics of Biological Systems & Materials, Society for Experimental Mechanics (SEM) Annual Conference, Orlando, FL; Jun 5–8, 2023
- **Invited Speaker** – "Micro-scale Life, Large-scale Influencers: Functional Consequences of Small-scale Biophysical Processes," Society for Integrative and Comparative Biology (SICB) Annual Meeting, Austin, TX; Jan 3–7, 2023
- **Plenary Speaker** – International Conference of the Developmental Biology of the Sea Urchin and Other Marine Invertebrates, Marine Biological Laboratory, Woods Hole, MA; Apr 13–17, 2022
- **Invited Speaker** – American Physical Society (APS) March Meeting, Rheology of Tissues Session, Chicago, IL; Mar 14–18, 2022

Invited Seminars & Colloquia

- **Florida Atlantic University**, Harbor Branch Oceanographic Institute *(in-person visit & seminar)* (2026)
- **Florida Atlantic University**, Dept. of Ocean & Mech. Engineering *(in-person visit & seminar)* (2025)
- **Tokyo University of Agriculture and Technology**, Tokyo, Japan *(in-person visit & seminar)* (2024)
- **Nagoya University**, Nagoya, Japan *(in-person visit & seminar)* (2024)
- **Kyoto University**, Kyoto, Japan *(in-person visit & seminar)* (2024)
- **Living Histories Seminar Series** *(virtual seminar)* (2024)
- **Developmental Mechanics Zoom Seminar Series** *(virtual seminar)* (2024)
- **Big Quantum Biology Meeting Series** *(virtual seminar)* (2024)
- **University of Leeds** (U.K.), School of Mathematics, Leeds Inst. for Fluid Dynamics *(virtual)* (2024)

- **University of Wisconsin–Madison**, Department of Mechanical Engineering *(group meetings)* (2023)
- **University of Oslo**, Norway – Njord Seminar *(virtual seminar)* (2023)
- **Auburn University**, Department of Biological Sciences *(in-person visit and colloquium)* (2022)
- **University of Miami**, Department of Civil and Architectural Engineering *(virtual seminar)* (2022)
- **University of Manchester** (U.K.), Dept. of Mechanical and Aero. Engineering *(virtual seminar)* (2022)
- **University of Miami**, Department of Chemistry *(hybrid seminar)* (2022)
- **Indian Institute of Science Education and Research (IISER)**, Career Center, Tirupati, India *(virtual)* (2021)
- **Florida International University**, Department of Physics *(in-person colloquium)* (2021)
- **University of Miami**, Regeneration Journal Club, The Miami Project *(virtual seminar)* (2021)
- **University of Miami**, Dr. John T. Macdonald Foundation Biomedical Nanotechnology Institute (BioNIUM) *(virtual seminar)* (2021)
- **University of Florida**, Department of Physics *(virtual colloquium)*
- **Biological Physics & Physical Biology (BPPB) Seminar Series** *(virtual)* (2021)
- **Northeastern University**, Department of Physics *(virtual colloquium)* (2020)
- **University of Miami**, Department of Marine Biology & Ecology, Rosenstiel School of Marine, Atmospheric, and Earth Science (RSMAS) (2020)
- **Leibniz University Hannover** (Germany) & **UC Berkeley**, The Mechanics Discussions Online Seminar Series (2020)
- **University of Rostock** (Germany) & **Aix Marseille University** (France), Interdisciplinary Online Seminar Series on Biolocomotion (2020)
- **Brandeis University**, Materials Research Science and Engineering Center *(virtual seminar)* (2020)
- **University of Miami**, Department of Biology *(virtual seminar)* (2020)
- **University of Miami**, Invertebrate Neuroscience Meeting (2020)
- **Cornell University**, Department of Biological and Environmental Engineering (2019)
- **Boston University**, Departments of Physics and Biology (2019)
- **University of Miami**, Department of Physics (2019)
- **Stanford University**, Shriram Center Basement Labs Seminar, Prakash Lab (2018)
- **Chan Zuckerberg Biohub**, Inter-lab Confab #3 *(lightning talk & poster)*, UC San Francisco (2018)
- **JMBC Multi-phase Flow Group Meeting**, TATA Steel Europe, The Netherlands (2013)
- **FOM-DROP Meeting**, TU Delft, The Netherlands (2013)
- **Stanford University**, Department of Bioengineering (2012)
- **University of California, Berkeley**, Fluid Mechanics Seminar (2012)
- **University of California, San Diego**, Department of Physics (2012)
- **JMBC Turbulence Group Meeting**, TU Eindhoven, The Netherlands (2011)

Selected Conference Talks and Posters (contributed):

- **Society for Experimental Mechanics (SEM)** – Talk, Vancouver, USA (2024)
- **American Physical Society (APS) March Meeting** – Talks, Minneapolis, USA (2024)
- **Ocean Sciences Meeting, American Geophysical Union (AGU)** – E-poster, New Orleans, USA (2024)
- **American Physical Society (APS) Division of Fluid Dynamics (DFD) Meeting** – Talks, Washington, D.C., USA (2023)
- **International Conference of the Developmental Biology of the Sea Urchin and Other Marine Invertebrates** – Talk, Woods Hole, MA, USA (2023)
- **Society for Developmental Biology (SDB) Annual Meeting** – Posters, Chicago, USA (2023)
- **Glass Art Society Annual Conference** – Lecture, Detroit, USA (2023)
- **Society of Integrative & Comparative Biology (SICB) Annual Meeting** – Posters, Austin, USA (2023)
- **Society for Developmental Biology (SDB) Annual Meeting** – Short talk & poster, Virtual (2020)
- **Society of Integrative & Comparative Biology (SICB) Annual Meeting** – Talk, Austin, USA (2020)
- **American Physical Society (APS) March Meeting** – Talk, Boston, USA (2019)
- **Society of Integrative & Comparative Biology (SICB) Annual Meeting** – Talk, Tampa, USA (2019)
- **American Society of Cell Biology (ASCB) – EMBO Meeting** – Talk, San Diego, USA (2018)
- **American Physical Society (APS) Division of Fluid Dynamics (DFD) Meeting** – Talk, Atlanta, USA (2018)
- **Santa Cruz Developmental Biology Meeting** – Poster, Santa Cruz, USA (2018)
- **American Physical Society (APS) March Meeting** – Talk, Los Angeles, USA (2018)
- **Mechanics of Morphogenesis Meeting** – Poster, Princeton University, USA (2018)
- **Biophysical Society (BPS) 62nd Annual Meeting** – Poster, San Francisco, USA (2018)
- **Society of Integrative & Comparative Biology (SICB) Annual Meeting** – Poster, San Francisco, USA (2018)
- **Pan-American Society for Evolutionary Developmental Biology Meeting** – Poster, University of California, Berkeley, USA (2015)
- **American Physical Society (APS) Division of Fluid Dynamics (DFD) Meeting** – Talk, San Francisco, USA (2014)
- **Active Fluids: Bridging Complex Fluids and Biofluids** – Poster, Aspen, USA (2014)
- **European Turbulence Conference (ETC) 14** – Lyon, France (2013)
- **Particles in Turbulence Conference** – Eindhoven, The Netherlands (2013)
- **American Physical Society (APS) Division of Fluid Dynamics (DFD) Meeting** – Talk, San Diego, USA (2012)
- **9th Euromech Fluid Mechanics Conference** – University of Rome Tor Vergata, Italy (2012)
- **Particles in Turbulence Workshop** – Lorentz Center, Leiden, The Netherlands (2012)
- **American Physical Society (APS) Division of Fluid Dynamics (DFD) Meeting** – Talk, Baltimore, USA (2011)
- **Particles in Turbulence Conference** – University of Potsdam, Germany (2011)

- **American Physical Society (APS) Division of Fluid Dynamics (DFD) Meeting** – Talk, Long Beach, USA (2010)
- **Physics@FOM Meeting** – Poster, Veldhoven, The Netherlands (2010–2013)
- **JMBC Burgersdag** – Poster, The Netherlands (2010–2013)
- **7th Euromech Fluid Mechanics Conference** – Manchester, UK (2008)

Teaching Experience

Assistant Professor, Department of Physics, University of Miami

Graduate/Undergraduate courses

- **PHY 625 / PHY 325 – Biological Physics I** *Fall 2022, Fall 2024 – 2025*
  Topics: Energy and order, probability, diffusion and random walks, motion in fluids, entropy and entropic forces, membrane potentials and nerve impulses, computer simulations, cellular automata.

Undergraduate courses

- **PHY 201 – University Physics for the Sciences I** *Spring 2024 – 2026*
  Topics: Mechanics, thermal phenomena, fluids, waves.
- **PHY 201 – University Physics for the Sciences I (SCALE-UP)** *Spring 2022 – 2023*
  Integrated lecture, discussion, and lab. Topics: Mechanics, thermal phenomena, fluids, waves.
- **PHY 202 – University Physics for the Sciences II (SCALE-UP)** *Fall 2021*
  Integrated lecture, discussion, and lab. Topics: Electromagnetism, optics, modern physics.
- **PHY 102 – College Physics II (SCALE-UP)** *Spring 2020 – 2021*
  Integrated lecture, discussion, and lab. Topics: Electromagnetism, optics, modern physics.
- **PHY 101 – College Physics I (SCALE-UP)** *Fall 2020*
  Integrated lecture, discussion, and lab. Topics: Mechanics, thermal phenomena, fluids, waves.

SCALE-UP: Student-Centered Active Learning Environment with Upside-Down Pedagogies – a modern instructional approach integrating lectures, labs, and collaborative problem-solving to promote active learning.

Guest Lectures

- **Seminars in Research Problems** (BIL 299), Prof. Julia Dallman, Department of Biology, University of Miami Feb 2024 *(in-person)*
- **Freshman Seminar: Physics of Biomolecular Nanomachines** (PHYS 190), Prof. S. Shekhar, Emory University Feb 2023 *(virtual)*, Sep 2020 *(virtual)*
- **Rho Rho Rho Marine & Atmospheric Undergraduate Honors Society** University of Miami Feb 2023 *(in-person)*
- **Model Class – Hands-On/Active Learning of Introductory Physics** University of Miami Family Weekend Oct 2022 *(in-person)*
- **Life in Moving Fluids** (MSC 364-G), Prof. Claire Paris-Limouzy, Rosenstiel School of Marine, Atmospheric, and Earth Science (RSMAS), University of Miami Sep 2021 *(in-person)*
- **Freshman Seminar: "Being a Scientist"** (FNS 190-P), Prof. V. Ramamurthy, Dept. of Chemistry University of Miami Oct 2020 *(virtual)*

Previous Teaching Experience

- **Postdoc Teaching Certificate Program**, Stanford University 2016–2018
  Participated in teaching and mentoring workshops, including "Teaching Workshop for Postdocs" and "Mentoring in Research Workshop."
- **Teaching Assistant**, University of Twente 2011–2013
  Experimental Techniques in Physics of Fluids (graduate course), Instructor: Prof. Chao Sun.
- **Teaching Assistant**, University of Twente 2010
  Physics of Fluids (undergraduate course), Instructor: Prof. Jacco Snoeijer.

Collaborators

At the University of Miami

- **Prof. Prannoy Suraneni** – Department of Civil & Architectural Engineering
- **Prof. Landolf Rhode-Barbarigos** – Department of Civil & Architectural Engineering
- **Prof. Athula Wikramanayake** – Department of Biology
- **Prof. Chris Langdon** – Department of Marine Biology & Ecology
- **Prof. Andrew Baker** – Department of Marine Biology & Ecology
- **Prof. Diego Lirman** – Department of Marine Biology & Ecology
- **Prof. Brian Haus** – Department of Ocean Sciences
- **Prof. Jenna Efrein** – Department of Art & Art History

Within the United States

- **Prof. Takashi Mikawa** – University of California, San Francisco
- **Prof. John Wallingford** – University of Texas at Austin
- **Prof. Arnold Mathijssen** – University of Pennsylvania
- **Prof. Cynthia Bradham** – Boston University
- **Prof. Mansi Srivastava** – Harvard University
- **Prof. Jacob Notbohm** – University of Wisconsin–Madison
- **Prof. Brian Camley** – Johns Hopkins University
- **Dr. Margaret Miller** – SECORE International
- **Dr. Ian Enochs** – National Oceanic and Atmospheric Administration (NOAA)

International Collaborators

- **Prof. Maciej Lisicki** – University of Warsaw, Poland

Research Mentoring Experience

Postdoctoral Research Associates

- **Dr. Melissa Ruszczyk**, Department of Physics *Sep 2022 – Jun 2025*
  (Ph.D. from Georgia Institute of Technology)
  Presently Assistant Professor, Keuka College, NY.
- **Dr. Santhan Chandragiri**, Department of Physics *Sep 2022 – Sep 2025*
  (Ph.D. from IIT Madras, India)
  Presently Research Associate, IIT Madras, India.

Graduate Students (Ph.D.)

- **Bikram D. Shrestha**, Physics *May 2020 – May 2025*
  Graduated May 2025; presently High School Teacher, Miami, FL
- **Shubham Sinha**, Physics *Aug 2021 – present*
- **Gopika Madhu**, Physics *Aug 2022 – present*
- **Patrick Kiel**, Marine Biology & Ecology, RSMAS *Jan 2022 – present*
  Co-advised by Prof. Diego Lirman (MBE, RSMAS), Prof. Prannoy Suraneni (UM Civil Engineering), and Dr. Ian Enochs (CIMAS/NOAA).
- **Christopher Roden**, Biology *Aug 2024 – present*
  Co-advised by Prof. Athula Wikramanayake (UM Biology).

Undergraduate Students

- **Christian D. Gibson**, B.S. Biomedical Engineering & Physics *Dec 2020 – May 2023*
  Presently Graduate Student, Duke University.
- **Valentina Restrepo**, B.S. Biomedical Engineering *May 2021 – Aug 2021*
- **Nina Couture**, B.S. Environmental Engineering *Sep 2021 – Aug 2022*
- **Samantha Levine**, B.S. Marine Science & Biology, RSMAS *Sep 2021 – Sep 2023*
  B.S. Honors Thesis: "Visualizing Suction Feeding Flow-fields in South Florida Coral Polyps"
  Presently Coral Biologist at I.CARE, Islamorada, FL.
- **Amaya Crichton**, B.S. Biology *Sep 2021 – Dec 2023*
- **Alexandra Redford**, B.S. Marine Science & Physics, RSMAS *Feb 2022 – 2024*
  Presently Graduate Student, Scripps Institute of Oceanography (SIO).
- **Carolyn "Jack" Delli-Santi**, B.S. Marine Science & Biology, RSMAS *May 2022 – Aug 2023*
  B.S. Honors Thesis: "A Novel Study of Trichoplax adhaerens Tissue Strain using Hot and Kiln Formed Glass Processes"
  Presently Graduate Student, University of Washington.
- **Leah Henseler**, B.S. Marine Affairs & Fine Art *Aug 2022 – present*
  Co-advised by Prof. Prannoy Suraneni (UM Civil Engineering).
- **Johnnie Xia**, B.S. Marine Science & Biology, RSMAS *Jan 2023 – Jul 2023*
- **Owen Brown**, B.S. Marine Science & Biology, RSMAS *May 2023 – 2024*
  B.S. Honors Thesis: "Synthesizing Artificial Replicates of Rising Coral Gamete Bundles"
  Presently Graduate Student, Oregon State University.
- **Inge Brijker**, B.S. Oceanography, RSMAS *May 2023 – 2024*
  B.S. Honors Thesis: "Quantifying Flow Fields With Particle Image Velocimetry During Flexible Feeding Behaviors Of South Florida Corals"
  Presently Graduate Student, Delft University of Technology, The Netherlands.
- **Ivan Levkovsky**, B.S. Chemistry *May 2023 – May 2024*
  Presently Graduate Student, Carnegie Mellon University.
- **Merritt Sherrer**, B.S. Marine Science & Biochemistry, RSMAS *2023 – present*
- **Katie Alvarez**, B.S. Biology *Mar 2024 – Jun 2024*
  Presently Graduate Student, Rosenstiel School, University of Miami.
- **J'nesse Balkman**, B.S. Marine Science & Biology, RSMAS *Jan 2024 – Jul 2024*
  NSF REU in Physical Sciences Fellow, UM Department of Physics.

- **Breelyn Cocke**, B.S. Physics & Mathematics, Northern Arizona University *May 2024 – Jul 2024*
  NSF REU in Physical Sciences Fellow, UM Department of Physics.
  Presently Graduate Student, Dartmouth College.
- **Soaiba Nuzhat**, B.S. Computer Science, Columbia University *May 2025 – Jul 2025*
  NSF REU in Physical Sciences Fellow, UM Department of Physics.
- **Ambar Condori-Boughton**, B.S. Marine Science & Biology, RSMAS *May 2025 – Jul 2025*

High School Students

- **Luis Flores** – Young Scholars Program (YSP), University of Miami *Summer 2022*

Graduate & Undergraduate Committee Membership

Graduate Dissertation Committee Membership

- **Yi Zhang**, Ph.D. student, Physics; Advisor: Prof. C. Song *May 2020 – 2023*
- **Kunal Tamang**, Ph.D. student, Physics; Advisor: Prof. C. Song *Apr 2021 – 2024*
- **Mingyue Wu**, Ph.D. student, Civil Engineering; Advisor: Prof. L. R. Pestana *Dec 2021 – May 2025*
- **Clara Haughey-Gramazio**, M.S. student, Marine Biology & Ecology, RSMAS;
  Advisor: Prof. C. Langdon *Dec 2022 – 2023*
- **Montale Tuen**, Ph.D. student, Civil Engineering;
  Advisor: Prof. Prannoy Suraneni *Aug 2023 – present*
- **Skylar Rodriguez**, M.S. student, Marine Biology & Ecology, RSMAS;
  Advisor: Prof. C. Langdon *Sep 2023 – 2024*
- **Oshani Fernando**, Ph.D. student, Physics; Advisor: Prof. M. Klein *Oct 2024 – present*
- **Kylee Rux**, Ph.D. student, Civil Engineering; Advisor: Prof. Prannoy Suraneni *Nov 2024 – present*
- **Reem F. A. S. H. Alreesh**, M.S. student, Marine Biology & Ecology, RSMAS;
  Advisor: Prof. C. Langdon *Sep 2024 – 2025*
- **Shreenath Guard**, Ph.D. student, Physics; Advisor: Prof. S. Syed *Apr 2025 – present*
- **Biwansh Kathri** , Ph.D. student, Physics; Advisor: Prof. C. Song *Apr 2026 – present*
- **Joe Unsworth** , Ph.D. student, Marine Biology & Ecology, RSMAS;
  Advisor: Prof. Diego Lirman *March 2026 – present*

Undergraduate Senior Thesis Committee Membership

- **Alexandra Redford**, B.S. student, Marine Science & Applied Physics; Advisor: Prof. M. Brown *2024*
- **Matthew McConnell**, B.S. student, Marine Science & Biology; Advisor: Prof. Diego Lirman *2024*

Previous Co-Mentoring Experience

- **Matthew Storm Bull**, Ph.D. student, Stanford University *Sep 2014 – Dec 2019*
  Presently Shanahan Foundation Fellow, Allen Institute & University of Washington.
- **William Gilpin**, Ph.D. student, Stanford University *Sep 2015 – Jul 2019*
  Presently Assistant Professor, Department of Physics, University of Texas at Austin.

- **Varghese Mathai**, Ph.D. student, University of Twente *Jun – Dec 2013*
  Presently Assistant Professor, Department of Physics, University of Massachusetts, Amherst.
- **Ernesto Mancilla**, Ph.D. student, visitor from UNAM (Mexico) to Univ. Twente *Jul – Dec 2012*
- **Jon Brons**, M.Sc. student, University of Twente *Aug – Dec 2013*
- **Tobias Foertsch**, M.Sc. student, University of Twente *Aug 2012 – Aug 2013*
- **Huanshu Tan**, M.Sc. student, visitor from Shanghai University to Univ. Twente *Jan – Apr 2013*

Professional Service – External

Journal Editorial (ad-hoc)

- Guest Editor, *Physics of Fluids*, Special Issue on "Kitchen Flows" *2021, 2024*

External Grant Reviews (ad-hoc)

- Cottrell Scholar Award (CSA), Research Corporation for Science Advancement (RCSA) *2025*
- Graduate Women in Science (GWIS) Research Awards *2022*
- National Science Foundation (NSF), DBIO, IOS, Physiological Mechanisms and Biomechanics (PMB) Program *2021*

Scientific Journal Reviews (ad-hoc)

- **High-Impact, Multidisciplinary Journals**: *Nature* (2), *PNAS* (3), *Science Advances* (1)
- **Physics and Applied Physics**: *Nature Physics* (3), *Physical Review Letters* (2), *Physical Review X* (2), *Physical Review X Life* (2), *Physical Review Applied* (2), Physical Review E (1).
- **Computational and Theoretical Biology**: *PLOS Computational Biology* (2), *Journal of Theor. Biology* (1)
- **Biology and Life Sciences**: *eLife* (1), *Current Biology* (4), *Journal of the Royal Society Interface* (2), *Proceedings of Royal Society B* (1)
- **Fluid Mechanics and Engineering**: *Journal of Fluid Mechanics* (12), *Physical Review Fluids* (2), *Physics of Fluids* (2), *International Journal of Multiphase Flow* (1), *European Journal of Mechanics / B Fluids* (1), *Ecological Engineering* (1)
- **Conference Abstract Reviews**: *16th Asian Congress of Fluid Mechanics, India — Abstract Reviewer* (1)

Conference Activities

Session Chair / Co-Chair

- **2025** – Concurrent Session 3A, *Developmental Biology of Sea Urchin and Other Marine Invertebrates* (DBSUMI), M.B.L., Woods Hole, MA (Chair)
- **2024** – "Cellular Force Generation and Mechanobiology" session, Society for Experimental Mechanics (SEM) Annual Meeting, Vancouver, WA (Co-Chair)
- **2023** – "Biofluids: Low Re Swimming III" session, American Physical Society (APS) Division of Fluid Dynamics (DFD) Meeting, Washington D.C. (Chair)

- **2023** – "Development of Specialized Structures: Cilia, Neurons, Biomineralization and Skeletogenesis" session, DBSUMI, M.B.L., Woods Hole, MA (Chair)
- **2021** – Plenary Session, Physical Mechanisms in Development, Society for Developmental Biology (SDB) Annual Meeting (Virtual) (Co-Chair)
- **2020** – Live Poster Presentations, SDB Annual Meeting (Virtual) (Chair)
- **2020** – "Dealing with Damage" session, Society for Integrative and Comparative Biology (SICB) Annual Meeting, Austin, TX (Co-Chair)
- **2019** – "Developmental Plasticity" session, SICB Annual Meeting, Tampa, FL (Co-Chair)

Judge

- **2025** – Student Oral Presentations, DBSUMI, M.B.L., Woods Hole, MA
- **2023** – Best Student Poster Awards, SDB Annual Meeting, Chicago, IL
- **2018** – Best Student Presentation Awards, Division of Invertebrate Zoology (DIZ), SICB Annual Meeting, San Francisco, CA

Invited Panelist

- **2023** – Fluids Education Luncheon, APS-DFD Meeting, Washington D.C.
- **2023** – Paul Allen Frontiers Group Ideas Session (Virtual) with Prof. Raymond Goldstein (University of Cambridge), Dr. Devaki Bhaya (Carnegie Institute), Alba Diz-Muñoz (EMBL)
- **2022** – Stanford University Postdoctoral Office Event on "Negotiating Academic Job Offers for Postdocs" (Virtual)

Advisory Roles

- **2025** – Member, "Living Futures" Advisory Group, APS Division of Biological Physics (DBIO)

Seminar Organization

- **2014–2016** – Organizer, Friday Afternoon "Happy to Talk Science Hour" Seminar Series, Shriram Center Basement, Stanford University (Funded by SPICE Grant, VP for Graduate Education)

Professional Service at the University of Miami

University-Level Service

- **2026** – Judge, Poster Presentations, Annual Graduate + Postdoctoral Research Symposium
- **2025** – Member, STEM Faculty Curricular Integration Network, Platform for Excellence in Teaching and Learning (PETAL)
- **2025** – Member, UM Provost's Teaching Award Selection Committee
- **2025** – Judge, Oral Presentations, Annual Graduate + Postdoctoral Research Symposium
- **2023** – Judge, Poster Presentations, Annual Graduate + Postdoctoral Research Symposium
- **2022** – Reviewer, College of Arts and Sciences Graduate Student Summer Research Awards
- **2022** – Reviewer, College of Arts and Sciences Academic Year Dissertation Awards
- **2021** – Member, Contemporary Glass Working Group, Lowe Art Museum

Department-Level Service (Department of Physics)

- **2024–present** – In-Charge, Department Website and Social Media
- **2024–present** – Co-Director (Co-PI), NSF REU program in Physical Sciences
- **2024** – Member, Search Committee for Undergraduate Physics Teaching Laboratories Coordinator
- **2022–2024** – Organizer, Department Weekly Coffee Meet-ups

Professional Memberships

Physics & Engineering Societies

- **2010–2013** – European Mechanics Society (EUROMECH)
- **2010–present** – American Physical Society (APS), Division of Fluid Dynamics (DFD), Division of Biological Physics (DBIO), Division of Soft Matter (DSOFT)
- **2023–present** – Society for Experimental Mechanics (SEM)
- **2024–present** – American Geophysical Union (AGU)

Biology & Life Sciences Societies

- **2018–2019** – American Society of Cell Biology (ASCB)
- **2017–2020** – Biophysical Society (BPS), Mechanobiology Subgroup
- **2017–present** – Society of Integrative and Comparative Biology (SICB)
- **2020–present** – Society for Developmental Biology (SDB)
- **2026–present** -– Sigma Xi – The Scientific Research Honor Society (Elected Member)

Science Communication and Outreach Activities

My outreach portfolio integrates research, education, and public engagement, with a focus on connecting the physical sciences, life sciences, and the arts. Through hands-on demonstrations, workshops, social media, and collaborative art and music projects, I work to engage diverse audiences, foster interdisciplinary dialogue, inspire future scientists, and broaden the cultural and intellectual impact of my research.

Lab Demonstrations

- Organized multiple lab visits and interactive demonstrations for diverse audiences, including the public, high school students, undergraduates, graduate students, and visiting researchers.

Foldscope Microscopy Training

- Participated in outreach microscopy workshops at Stanford University to train high school students in using the *Foldscope*, a widely adopted $1 paper microscope for accessible science education.

Student Outreach Workshops and Talks

- Led Physics/Biology workshops for UM *First Star Academy* students (K–12) (Summer 2024, 2025), as part of the NSF REU program in Physical Sciences. *First Star Academy* supports high school students in foster care pursuing STEM and higher education.
- Led a Physics/Biology workshop for middle school students in Miami-Dade community (July 2023).
- Led a Physics/Biology workshop for *First Star Academy* students (K–12) (December 2021).

- Delivered a virtual marine biology class for 7th-grade STEAM students at Aventura Waterways Preparatory Academy (Miami, FL).

Connecting Science and Art

- Collaborating with Prof. Jenna Efrein, Senior Lecturer in Glass (UM Department of Art and Art History), to explore glass as a medium linking physics, marine biology, and art.
  See: Glass Art Society Journal Article (2023)
- Co-organized a public outreach event: *LOWE CONNECTS:* "Exploring Art, Marine Biology, and Engineering to Address Climate Challenges" with Profs. Jenna Efrein & Prannoy Suraneni. Featured glass, concrete, clay corals, and presentations with *Rescue a Reef program*, and funding from the University of Miami U-LINK program (4/2024).

Connecting Science and Music

- My postdoc Dr. Melissa Ruszczyk collaborated with Indigo Knecht and other students in the Frost School of Music to work on several inter-disciplinary Music + Science "sonification" projects.
- Dr. Melissa Ruszczyk and her collaborators organized a concert: "Music from Science: Sonic Explorations of Coral Larvae Swimming Data". This interdisciplinary concert event featured five original sonifications of the same 3D trajectory dataset of coral larvae swimming, each mapping scientific variables such as tempo, pitch, rhythm, and dynamics to distinct musical interpretations. The project highlighted sonification as both a scientific tool for analyzing multivariate data and an engaging medium for public science communication, supported in part by the UM U-LINK program (4/2025).

Social Media and Science Communication

- Create lay-accessible research summaries on LinkedIn and "Tweetorials" on Twitter/X and BlueSky incorporating images and videos to reach both scientific and public audiences. Engagement: several thousand views per post; my accounts have several thousands of followers all over the world.
- Produced a short science outreach video in collaboration with the University of Miami multimedia team. Featured at the University of Miami's exhibit at the *eMerge Americas* conference (March 2024). Watch Video Feature : Physics of Coffee Video

Media Coverage

Media Impact Summary

- **Coverage span:** 2013–2026 (13 years)
- **Total media mentions:** 50+ across international, national, and local outlets
- **High-profile outlets:** *New York Times, Popular Science, Scientific American, Vox, Smithsonian, Phys.org*
- **Themes:** Marine biophysics, fluid dynamics, developmental biology, science–art, science–music

Detailed Media Coverage

- **News/Press:** Connecting Science and Music (2025)
  - **University of Miami News:** A laboratory muse
- **News/Press:** Biophysics of development in chick embryos publication in PNAS (2025)
  - **University of Miami News:** Illuminating the beginnings of animal development
  - Phys.org: Biophysics research illuminates the beginnings of animal development

  - EurekAlert!: Illuminating the beginnings of animal development

- **News/Press:** Connecting Science and Art (2024)
  - Connecting Science and Art, **Physics Magazine:** Modeling Tissue Mechanics with Molten Glass
  - Comment on Article, **Physics Magazine:** Glowing Algae Change Morphology to Avoid Light

- **News/Press:** Culinary Fluid Mechanics publication in the Reviews of Modern Physics (2023)
  - **University of Miami News:** Illuminating physics in the kitchen
  - **Physics Magazine:** From Whiskey to Oreos
  - EurekAlert!: Science in the kitchen
  - Phys.org Q&A: Illuminating physics in the kitchen

- **News/Press:** Connecting Science and Art (2023)
  - **University of Miami News:** Glass provides a window into science

- **Interviews/Q&A:** (2023)
  - **Integrative and Comparative Biology** blog: Career transitions between Physics and Biology

- **News/Press:** DARPA X-REEFs award (2022)
  - **University of Miami News:** Reef Revitalization

- **Interviews/Q&A:** (2021)
  - BioNIUM Newsletter, University of Miami: Interview feature

- **News/Press:** Postdoc Publication on *Trichoplax* Fractures (2020)
  - **The Atlantic:** The Search for the World's Simplest Animal

- **Award Coverage:** (2017)
  - NSF *Vizzies* Visualization Challenge — 'Expert's Choice award': Award page

- **News/Press:** (2017)
  - **Popular Science:** The 10 best science images, videos, and visualizations of the year
  - **Stanford Medicine:** Stanford team's image of starfish larva wins top honor
  - **Science Node:** The winner takes it all

- **Publication/Press Features:** *Nature Physics* publication on starfish larvae (2016)
  - **New York Times:** The Beauty of a Starfish Larva at Lunch
  - **Nature News:** Swimming starfish, a departing dinosaur, and a lot of ice
  - **Stanford News:** Starfish larvae create complex water whorls to eat and run
  - **Scientific American:** The Mesmerizing Motions of Starfish Larvae [Video]
  - **Stanford Magazine:** A Striking Look at Starfish Larvae
  - **Phys.org:** Starfish larvae create complex water whorls to eat and run
  - **Live Science:** Starfish Larvae Churn Whirlpools With 100,000 Tiny Hairs
  - **Science Daily:** Starfish larvae create complex water whorls to eat and run

  - **Bay Nature:** The Efficient Beauty of Starfish Larvae
  - **EurekAlert!:** Starfish larvae create complex water whorls to eat and run
  - **Futurity:** Why baby starfish make these pretty whorls in water
  - **EarthSky:** The water whorls of baby starfish
  - **ACSH:** Revealing The Wonders Of How Starfish Survive And Grow
  - **SciGuru:** Starfish larvae create complex water whorls to eat and run
- **Award Coverage: Nikon Small World in Motion — First place** (2016)
  - Video link
  - **Nikon:** Time-lapse revealing water patterns of starfish larva wins Nikon Small World in Motion Competition
  - **Popular Science:** The year's best videos starring really, really small things
  - **Business Insider:** These are the best videos recorded through a microscope this year, according to Nikon
  - **Daily Mail:** Nikon reveals the best videos shot through a microscope
  - **CBS News:** Small world in motion: Nikon contest winners
  - **Smithsonian:** Prize-Winning Videos Capture Mesmerizing, Microscopic World
  - **Live Science:** Tiny Starfish Larva Mesmerizes in Award-Winning Video
  - **Seeker:** Hunting Starfish Larva Takes the Top Prize in Micro Video Competition
  - **BBC Focus Magazine:** Nikon Small World in Motion brings photomicrography to life
- **Award Coverage: APS/DFD Milton van Dyke Award (Video)** (2016)
  - Video link
  - **APS News:** Gallery of Fluid Motion Winners from the 2016 APS Division of Fluid Dynamics Meeting
  - **Vox:** This is how a baby starfish eats. It involves vortexes of doom.
  - **FYFD:** Starfish larvae create beautiful vortices to help themselves catch food.
- **Award Coverage: Nikon Small World in Motion — Honorable mention** (2015)
  - Video link
- **News/Press:**
  - **Huffington Post:** 18 Award-Winning Videos: Hidden micro realm is beautiful
- **Video Features:**
  - **The Atlantic Video:** Incredible Video Taken Through a Microscope
- **Award Coverage:** *New Journal of Physics* 'Video Abstract Prize' Video link (2013)
- **News/Press:**
  - University of Twente News: UT Researchers win NJP video competition
  - Dutch media: RTV-OOST NL, Tubantia NL

References

(available upon request)