

Nicole W. Xu, Ph.D.

**Assistant Professor, Paul M. Rady Department of Mechanical Engineering,
University of Colorado Boulder**

Office: ECME 216 / Lab: ECNW 180 / Mail: 427 UCB

1111 Engineering Dr., Boulder, CO 80309

nicole.xu@colorado.edu

www.nicolexulab.com

Education

Stanford University, Stanford, CA	2015-2020
Ph.D. in Bioengineering , School of Engineering, School of Medicine	
Advisor: John O. Dabiri	
California Institute of Technology, Pasadena, CA	2014-2015
M.S. in Bioengineering , Division of Biology and Biological Engineering	
Advisor: John O. Dabiri	
University of Pennsylvania, Philadelphia, PA	2010-2014
B.S.E. <i>summa cum laude</i>, Bioengineering , School of Engineering and Applied Science	

Professional Experience

University of Colorado Boulder	2023-Present
Assistant Professor , Paul M. Rady Department of Mechanical Engineering, Robotics	
Program, BioFrontiers Institute	
College of Engineering and Applied Science	
U.S. Naval Research Laboratory	2021-2023
National Research Council (NRC) Postdoctoral Scholar	
Laboratories for Computational Physics & Fluid Dynamics	
Advisors: Ravi Ramamurti, Jason D. Geder, Kamal Viswanath	
California Institute of Technology	2020
Postdoctoral Scholar in Aerospace Dabiri Laboratory	
Advisor: John O. Dabiri	

Grants and Fellowships

Excellence in Engineering Fund , <i>Awarded \$15,000, Matched \$5,000 by ME</i>	2024
Constant-flow jellyfish tank for engineering education and outreach with future applications to use cyborg jellyfish to track climate change	
Office of Naval Research STEM Program N00014-23-S-F005 , <i>Awarded \$70,000</i>	2023
Stories of Women in Fluids Initiative: Anthology Book Series	
PI: Kelli Hendrickson; Advisory Board (unpaid): Roni Goldshmid, Swathi Krishna, Beverley McKeon, Banafsheh Seyed-Aghazadeh, Nicole Xu	

CU Boulder Office of Faculty Affairs Faculty Success Program Grant, <i>Awarded \$4,650</i>	2023
Funding to participate in the NCFDD Faculty Success Program	
BISCCIT Travel Exchange, <i>Awarded \$4,973</i>	2023
Bio-Inspired Sensing, Computing, and Control International Teams	
University of Washington and Air Force Office of Scientific Research	
CU Boulder ME Department DEI Action Grant, <i>Awarded \$2,859.58</i>	2023
Stories of Women in Fluids Initiative: Anthology Book Series	
American Physical Society (APS) Forum on Outreach and Engaging the Public Mini-Grant	2023
Stories of Women in Fluids Initiative: Anthology Book Series	
<i>Awarded the maximum amount of \$2,500</i>	
Co-PIs: Roni Goldshmid, Kelli Hendrickson, Swathi Krishna, Beverley McKeon, Nicole Xu	
U.S. Naval Research Laboratory (NRL) , 6.2 Base Program New Start	2022
Bioinspired modulated skins for flow control and turbulence reduction (BioSkin)	
NRC Research Associateship at the U.S. Naval Research Laboratory (NRL)	2020
National Research Council, U.S. National Academies of Science, Engineering, and Medicine	
NRC Research Associateship at the National Institute of Standards and Technology (NIST)	2020
National Research Council, U.S. National Academies of Science, Engineering, and Medicine	
<i>Awarded, declined to accept the NRC Research Associateship at NRL</i>	
University of Maryland, College Park Maryland Robotics Center Postdoctoral Fellowship	2020
<i>Selected, not awarded due to COVID-related hiring freezes</i>	
Stanford University Ric Weiland Family Fellowship	2017
Stanford University Timothy G. Shi Graduate Fellowship	2017
National Science Foundation Graduate Research Fellowship	2015
California Institute of Technology Rosen Fellowship	2014
California Institute of Technology Summer Undergraduate Research Fellowship	2013

Honors and Awards

Travel Award for NSF FRR/NRI Meeting Aspiring PIs Workshop	2023
National Science Foundation Foundational Research in Robotics - National Robotics Initiative Principal Investigators' Meeting	
Travel Award for SOAR/BISCCIT Meeting	2023
Bio-Inspired Sensing, Computing, and Control International Teams	
University of Washington and Air Force Office of Scientific Research	
Lab Safety Coordinator Health and Safety Commendation	2017
School of Engineering, Stanford University	
Rosen Bioengineering Distinguished Scholar Award	2014
California Institute of Technology	
Intel-Cornell Cup USA Finalist	2014
Undergraduate Embedded Design Competition	
Rice 360°Design Competition Finalist	2014
Beyond Traditional Borders National Undergraduate Global Health Technologies	
Benjamin Franklin Scholar (Undergraduate Honors Society, Invited)	2010-2014
University of Pennsylvania	
Dean's List	2010-2011, 2012-2013, 2013-2014
School of Engineering and Applied Science, University of Pennsylvania	

Peer-Reviewed Publications

Students and postdoctoral scholars underlined.

17. Sampath K., Geder J.D., **Xu N.W.**, Ramamurti R., Pruessner, M.D. Thrust and wake characterization of tandem flexible flapping fins, under review.
 16. **Xu N.W.**, Lenczewska O., Wieten, S.E., Federico, C.A., Dabiri J.O. 2024. Ethics of biohybrid robotic jellyfish modification and invertebrate research, under review.
 15. **Xu N.W.** 2024. Float like a butterfly, swim like a biohybrid neuromuscular robot. *Science Robotics*, 9, eads4127, DOI:10.1126/scirobotics.ads4127 [\[Link\]](#)
 14. Graybill M.T., **Xu N.W.** 2024. Experimental studies of bioinspired shark denticles for drag reduction, *Integrative and Comparative Biology*, 64(3):742752. [\[Link\]](#)
 13. **Xu N.W.** 2024. To do better science, try dance. The Back Page, *APS News*. [\[Link\]](#)
 12. **Xu N.W.**, Dabiri J.O. 2024. “The creation of an augmented jellyfish: Ethical considerations from a scientific perspective,” *Transanimalisme: L’animal augmenté, entre exploitations et protections*, Eds. Amandine Cayol, Emilie Gaillard, Bénédicte Bévière-Boyer. Mare et Martin, ISBN: 978-2-38600-002-7.
 11. Webster-Wood V.A., Guix M., **Xu N.W.**, Behkam B., Sato H., Sarkar D., Sanchez S., Shimizu M., Parker K.K. 2023. Biohybrid robots: Recent progress, challenges, and perspectives. *Bioinspiration & Biomimetics*, 18(1): 015001, DOI: 10.1088/1748-3190/ac9c3b. [\[Link\]](#)
 10. **Xu N.W.**, Dabiri J.O. 2022. Bio-inspired Ocean Exploration. *Oceanography*, 35(2):3548, <https://doi.org/10.5670/oceanog.2022.214>. [\[Cover story, link\]](#)
 9. Sampath K.*, **Xu N.W.***, Geder J.D., Pruessner M., Ramamurti R. 2022. Flapping soft fin deformation modeling using planar laser-induced fluorescence imaging. *Journal of Visualized Experiments*, (182), e63784, doi:10.3791/63784. [\[Link\]](#) [\[Video\]](#)
- *These authors contributed equally to this paper.
8. **Xu N.W.**, Townsend J.P., Costello J.H., Colin S.P., Gemmell B.J., Dabiri J.O. 2021. Developing biohybrid robotic jellyfish (*Aurelia aurita*) for free-swimming tests in the laboratory and in the field. *Bio-protocol*, 11(7): e3974. [\[Link\]](#)
 7. Hoover A.P., **Xu N.W.**, Gemmell B.J., Colin S.P., Costello J.H., Dabiri J.O., Miller L.A. 2021. Neuromechanical wave resonance in jellyfish bell swimming, *Proceedings of the National Academy of Sciences of the U.S.A.*, 118(11): e2020025118. [\[Link\]](#)
 6. **Xu N.W.** 2021. Squid-inspired robots perform swimmingly. *Science Robotics*, 6, eabf4301. [\[Link\]](#)
 5. **Xu N.W.**, Townsend J.P., Costello J.H., Colin S.P., Gemmell B.J., Dabiri J.O. 2020. Field testing of biohybrid robotic jellyfish to demonstrate enhanced swimming speeds. *Biomimetics*, 5(4), 64. [\[Link\]](#) [\[Video summary\]](#)
 4. **Xu N.W.**, Dabiri J.O. 2020. Low-power microelectronics embedded in live jellyfish enhance propulsion. *Science Advances*, 6(5), eaaz3194. [\[Cover story, link\]](#)
 3. Bahl V.*, Lin S.*, **Xu N.***, Davis B., Wang Y., Talbot P. 2012. Comparison of electronic cigarette refill fluid cytotoxicity using embryonic and adult models. *Reproductive Toxicology*, 34(4):529-537. [\[Link\]](#)
- *These authors contributed equally to this paper.
2. Behar R., Bahl V., Wang Y., Lin S., **Xu N.**, Davis B., Talbot P. 2012. A method for rapid dose-response screening of environmental chemicals using human embryonic stem cells. *Journal of Pharmacological and Toxicological Methods*, 66(3):238-245. [\[Link\]](#)

1. **Xu N.W.**, Xu S., Ehlers J. 2009. Estimating the broad-sense heritability of early growth of cowpea. *International Journal of Plant Genomics*, ID 984521. [\[Link\]](#)

Field Experience

Marine Biological Laboratory, Woods Hole, MA

2019

Whitman Center Assistant | Research Scientist

Collaborators: [Professor John “Jack” Costello, Ph.D.](#), Providence College; [Professor Sean Colin, Ph.D.](#), Roger Williams University; Dr. James Townsend, Providence College

Invited and Keynote Talks

35. **Xu N.W.** 2025. Biohybrid robotic jellyfish and bioinspired designs for ocean exploration. Maryland Robotics Center Seminar, University of Maryland, College Park, May 2, College Park, MD. [Upcoming]
34. **Xu N.W.** 2024. Biohybrid robotic jellyfish and bioinspired designs for ocean exploration. Environmental and Biological Fluid Dynamics Seminar, University of Pennsylvania, May 16, Philadelphia, PA.
33. **Xu N.W.** 2024. Bio-hybrid robotic jellyfish: Applications and implications in biology, robotics, oceanography, and ethics. “Bio-hybrids: when robots get alive,” IEEE Robosoft, Apr 14-17, San Diego, CA.
32. Hendrickson K., with contributions from Flack K., Goldshmid R., Sharp N., **Xu N.W.** 2024. Women in Fluids: Stories of How We Persevere, Survive, and Thrive. Invited talk for the session, “Breaking Barriers in Physics,” APS March Meeting 2024, Mar 4-8, Minneapolis, MN.
31. **Xu N.W.** 2024. Biofluids in robotics and underwater vehicles: Biohybrid robotic jellyfish, shark skins, and fish fins. Guest lecture for MCEN 5171: Biofluids on the Micro Scale, Feb 9, Boulder, CO.
30. **Xu N.W.** 2024. Hydrodynamic and acoustic noise measurements of shark skin-inspired surfaces. “Computational and Physical Models in Research and Teaching to Explore Form-Function Relationships,” Society for Integrative and Comparative Biology Annual Meeting, Jan 2-6, Seattle, WA.
29. Hendrickson K., Goldshmid R., Krishna S., McKeon B., **Xu N.W.** 2023. The Stories of the Women in Fluids Initiative. Invited session for the minisymposium “The Stories of Women in Fluids,” 76th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Nov 19-21, Washington, DC.
28. Krishna S., Hendrickson K., Goldshmid R., Sharp N., **Xu N.W.** 2023. The Stories of Women in Fluids: Persevere, Survive, and Thrive. Invited session for the minisymposium “The Stories of Women in Fluids,” 76th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Nov 19-21, Washington, DC.
27. **Xu N.W.** 2023. Bioinspired aquatic robots for ocean exploration. Mechanical Engineering Strategic Advisory Board (MESAB), University of Colorado Boulder, Nov 10, Boulder, CO.
26. **Xu N.W.** 2023. Biohybrid robotic jellyfish and bioinspired design for ocean exploration. Flow Seminar Series, Brown University, Apr 24, Providence, RI. [\[Link\]](#)

25. **Xu N.W.*.** 2023. Bioinspired aquatic vehicles for ocean exploration: robotic jellyfish, shark skin surfaces, and fish fins. Bio-Inspired Sensing, Computing, and Control International Teams (SOAR/BISCCIT), March 22-24, AFOSR BRICC facility in Arlington, VA.
24. **Xu N.W.** 2022. Bioinspired robots and underwater vehicles for real-world applications. Paul M. Rady Department of Mechanical Engineering, University of Colorado Boulder, Mar 18, Boulder, CO.
23. **Xu N.W.** 2022. Bioinspired robots and underwater vehicles for real-world applications. Department of Mechanical & Materials Engineering, University of Denver, Feb 18, Denver, CO. [Virtual]
22. **Xu N.W.** 2022. Biohybrid robotic jellyfish and bioinspired design for ocean exploration. Department of Mechanical Engineering Seminar Series, George Mason University, Jan 28, Fairfax, VA. [Virtual]
21. **Xu N.W.** 2022. Bioinspired robots and underwater vehicles for real-world applications. Department of Mechanical Engineering, University of Wisconsin-Madison, Jan 14, Madison, WI. [Virtual]
20. **Xu N.W.** 2021. Creation of an augmented remote-controlled jellyfish. International Multidisciplinary Symposium for TransAnimalism, CNRS Normandy Chair of Excellence for Peace, Dec 3, Normandy, France. [Virtual] [\[Link\]](#)
19. **Xu N.W.** 2021. Biohybrid robotic jellyfish and bioinspired design for ocean exploration. Department of Aerospace Engineering Seminar Series, University of Maryland, College Park, Nov 30, College Park, MD. [Virtual]
18. **Xu N.W.** 2021. Developing biohybrid robotic jellyfish for future applications in ocean exploration. Applied Ocean Science Seminar Series, Scripps Institution of Oceanography, Nov 18. [Virtual]
17. **Xu N.W.** 2021. Biohybrid robotic jellyfish and bioinspired design for swimming robots. 43rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Oct 30. [Virtual] [\[Link\]](#)
16. **Xu N.W.** 2021. Developing biohybrid robotic jellyfish for future applications in ocean exploration. Center for Coastal and Ocean Mapping and the Department of Ocean Engineering Seminar Series, University of New Hampshire, Oct 29. [Virtual] [\[Link\]](#)
15. **Xu N.W.** 2021. Biohybrid robotic jellyfish: Using microelectronics to drive live jellyfish swimming. Intelligent and Bio-inspired Mechanics (Seminar), Massachusetts Institute of Technology, Sept 29. [Virtual] [\[Seminar series info\]](#) [\[Link to video recording\]](#)
14. **Xu N.W.** 2021. Robotic control of live jellyfish for ocean exploration. Invited speaker and panelist for the workshop, “It’s Alive!: Biohybrid robots made from living materials.” Living Machines 2021, 10th International Conference on Biomimetic and Biohybrid Systems, July 26-30. [Virtual] [\[Link to workshop info\]](#)
13. **Xu N.W.** 2021. Biohybrid robotic jellyfish and bioinspired swimming robots. Stanford EXPLORE Course, July 26, Stanford, CA. [Virtual]
12. **Xu N.W.** 2021. Biomechanics of bionic jellies (and squid robots). George Washington University High School Summer Program with the Smithsonian National Zoological Park, sponsored by the Office of Naval Research, July 22. [Virtual]
11. **Xu N.W.** 2021. Bionic jellies, climate change, and career pathways; Guided activity on how to give an oral presentation. United States Earth Science Organization (formerly United States Earth Science Olympiad), July 13, Burlington, VT. [Virtual]
10. **Xu N.W.** 2021. Resonance in nature and bioinspired squid robots. Invited speaker and panelist for the workshop, “What are feedback systems and how are they critical to our

- increasingly automated world.” American Control Conference, May 25-28, New Orleans, LA. [Virtual] [\[Link to special sessions\]](#) [\[Link to video\]](#)
9. **Xu N.W.** 2021. Biohybrid robotic jellyfish and bioinspired robots for ocean exploration. University of California, San Diego, Mechanical and Aerospace Engineering: Fluid Mechanics, Combustion, & Engineering Physics Seminar, Jan 18, La Jolla, CA. [Virtual]
 8. **Xu N.W.** 2020. Robotic control of live jellyfish. National Institute of Standards and Technology, Aug 26, Gaithersburg, MD. [Virtual]
 7. **Xu N.W.** 2020. Development and deployment of biohybrid robotic jellyfish. Naval Research Laboratory, July 30, Washington, D.C. [Virtual]
 6. **Xu N.W.** 2020. Robotic control of live jellyfish. Stanford EXPLORE Course, July 20, Stanford, CA. [Virtual]
 5. **Xu N.W.**, Dabiri J.O. 2020. Biohybrid robotic jellyfish for future applications in ocean monitoring. High-Performance Computing and Artificial Intelligence (HPC-AI) Advisory Council Conference, April 21-22, Stanford, CA. [Virtual] [\[Link to video, talk\]](#) [\[Link to video, interview\]](#)
 4. **Xu N.W.** 2020. Robotic control of live jellyfish swimming to enhance propulsion. Georgia Institute of Technology, Physics of Living Systems, Feb 13, Atlanta, GA.
 3. **Xu N.W.** 2020. Robotic control of live jellyfish swimming to enhance propulsion. Bucknell University, Department of Mechanical Engineering, Jan 17, Lewisburg, PA.
 2. **Xu N.W.** 2019. Artificial control of live jellyfish to study the structure-function of animal locomotion. Princeton University, Center for the Physics of Biological Function, Dec 9, Princeton, NJ.
 1. **Xu N.W.**, Dabiri J.O. 2018. Cyborg jellyfish swimming. Stanford University Graduate Alumni Day, May 19, Stanford, CA. [\[Link to video\]](#)

Presentations

41. Su Y.*, **Xu N.W.** 2025. Hydrodynamic Effects of Oral Arms on Jellyfish Locomotion. Society for Integrative and Comparative Biology Annual Meeting, Jan 3-7, Atlanta, GA. [Talk, upcoming]
40. Graybill M.T.*, **Xu N.W.** 2024. Shark Skin-Inspired Surface Features to Enhance the Hydrodynamic Performance of Flapping Fin Propulsion. 77th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Nov 24-26, Salt Lake City, UT. [Talk, upcoming]
39. Su Y.*, **Xu N.W.** 2024. Biodegradable Tracer Particles for Underwater Particle Image Velocimetry. 77th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Nov 24-26, Salt Lake City, UT. [Talk, upcoming]
38. **Xu N.W.***, Hendrickson K., Goldshmid R., Krishna S., McKeon B., Seyed-Aghazadeh B. 2024. Retaining Early Career Underrepresented Scientists: The Stories of Women in Fluids Initiative. 77th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Nov 24-26, Salt Lake City, UT. [Talk, upcoming]
37. Hendrickson K.*, Goldshmid R., Krishna S., McKeon B., Seyed-Aghazadeh B., **Xu N.W.** 2024. Scientific Storytelling for Middle Grade Audiences: “The Story of a Girl.” 77th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Nov 24-26, Salt Lake City, UT. [Talk, upcoming]
36. **Xu N.W.** 2024. Biohybrid robotic jellyfish and bioinspired designs for ocean exploration. Robotics Program Seminar, University of Colorado Boulder, Oct 8, Boulder, CO.

- [Upcoming]
35. Su Y.*, **Xu N.W.** 2024. Bioinspired flapping foils for renewable energy harvesting and underwater propulsion. 9th Annual Rocky Mountain Fluid Mechanics Research Symposium, Aug 6, Boulder, CO. [Talk]
 34. **Xu N.W.*** 2024. Bioinspired and Biohybrid Aquatic Robots for Ocean Exploration and Medicine. Bio-Inspired Sensing, Computing, and Control International Teams (SOAR/BISCCIT), Aug 5-7, Royal School of Mines, London, UK. [Talk]
 33. Stocking J.*, Sampath K., **Xu N.W.**, Geder J.D., Matt S. 2024. A reduction in near-field hydroacoustic flow noise using shark-skin inspired surfaces. Meeting of the Acoustical Society of America, May, Ottawa, CA. [Talk]
 32. **Xu N.W.*** Biohybrid robotic jellyfish, artificial shark skins, and fish-inspired propulsion for ocean exploration. 2023 NSF Foundational Research in Robotics - National Robotics Initiative Principal Investigators' Meeting, May 1-3, Arlington, VA. [Poster]
 31. **Xu N.W.***, Sampath K., Geder J.D., Pruessner M., Ramamurti R. 2022. Hydrodynamic performance enhancements of shark skin-inspired surfaces on foils and robotic fish fins. 75th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Nov 20-22, Indianapolis, IN. [Abstract] [Talk]
 30. **Xu N.W.***, Sampath K., Geder J.D., Pruessner M., Ramamurti R. 2022. Hydrodynamic performance enhancements of shark skin-inspired surfaces on foils and robotic fish fins. Meeting of the Marine Technology Society Bioinspired Marine Systems Committee, on the topic of Sensing and Hydrodynamic Performing of Underwater Swimmers, Sept 9, Woodbridge, VA. [Talk]
 29. **Xu N.W.***, Sampath K., Geder J.D.*, Ramamurti R. 2022. Bioinspired shark skin surfaces for drag reduction. Sea-Air-Space Exposition, April 4-6, National Harbor, MD. [Expo, representative for NRL as an exhibitor]
 28. **Xu N.W.*** 2022. Bionic jellyfish, artificial shark skins, and bioinspired robots for ocean exploration. The Future Brighter, April 1, 4, & 7, Alexandria, VA. [Talk, virtual]
 27. **Xu N.W.***, Townsend J.P., Costello J.H., Colin S.P., Gemmell B.J., Dabiri J.O. 2022. Biohybrid robotic jellyfish and soft bioinspired robots. Focus Session on Soft Robotic Matter, American Physical Society March Meeting, Mar 14-18, Chicago, IL. [Abstract] [Talk]
 26. **Xu N.W.***, Sampath K., Geder J.D., Ramamurti R. 2022. Sharkskin-inspired surfaces for turbulent drag reduction. Ocean Sciences Meeting, Feb 27-Mar 31, Honolulu, HI. [Abstract] [Talk, virtual]
 25. Mohebbi N*, **Xu N.W.**, Dabiri J.O. 2021. Influence of flow on sea-water battery fouling. 74th Meeting of the American Physical Society Division of Fluid Dynamics Meeting, Nov 21-23, Phoenix, AZ. [Abstract] [Talk]
 24. **Xu N.W.***, Townsend J.P., Costello J.H., Colin S.P., Gemmell B.J., Dabiri J.O. 2021. Robotic control of live jellyfish swimming in the laboratory and Atlantic Ocean. 25th International Congress of Theoretical and Applied Mechanics 2020+1, Aug 22-27, Milan, Italy. [Talk, virtual] [Schedule]
 23. **Xu N.W.***, Townsend J.P., Costello J.H., Colin S.P., Gemmell B.J., Dabiri J.O. 2020. Field testing of biohybrid robotic jellyfish to demonstrate enhanced swimming speeds. 73rd Meeting of the American Physical Society Division of Fluid Dynamics Meeting, Nov 22-24, Chicago, IL. [Abstract] [Talk, virtual]
 22. **Xu N.W.*** 2020. Bionic jellies, climate change, and career pathways. United States Earth Science Organization (formerly United States Earth Science Olympiad), July 27, Burlington, VT. [Talk, virtual]

21. **Xu N.W.***, Dabiri J.O. 2020. Robotic control of live jellyfish. Stanford Bioengineering, May 18, Stanford, CA. [Defense, virtual]
20. **Xu N.W.***, Dabiri J.O. 2020. Robotic control of live jellyfish swimming to enhance propulsion. American Physical Society March Meeting, March 2-6, Denver, CO. [\[Abstract\]](#) [Conference cancelled due to COVID-19]
19. **Xu N.W.***, Dabiri J.O. 2020. Metabolic costs of enhancing propulsion in live biohybrid robotic jellyfish. Society for Integrative and Comparative Biology Annual Meeting, Jan 3-7, Austin, TX. [\[Abstract\]](#) [Talk]
18. **Xu N.W.***, Dabiri J.O. 2019. Enhanced propulsion of live jellyfish using low-power onboard microelectronics. Stanford Bioengineering Student Seminar, Dec 3, Stanford, CA. [Talk]
17. **Xu N.W.***, Dabiri J.O. 2019. Metabolic costs of enhancing propulsion in artificially controlled live jellyfish. 72th Meeting of the American Physical Society Division of Fluid Dynamics Meeting, Nov 23-26, Seattle, WA. [\[Abstract\]](#) [Talk]
16. **Xu N.W.***, Dabiri J.O. 2019. Metabolic costs of enhancing propulsion in artificially controlled live jellyfish. Stanford Bioengineering Retreat, Oct 11-12, Santa Cruz, CA. [Poster]
15. **Xu N.W.***, Dabiri J.O. 2019. Low-power microelectronics embedded in live jellyfish enhance propulsion. Stanford Environmental Fluid Mechanics Laboratory Seminar, Oct 4, Stanford, CA. [Talk]
14. **Xu N.***, Dabiri J.O. 2019. Stimulation of latent enhanced propulsion in freely swimming jellyfish. Society for Integrative and Comparative Biology Annual Meeting, Jan 3-7, Tampa, FL. [\[Abstract\]](#) [Talk]
13. **Xu N.W.***, Dabiri J.O. 2018. Stimulation of latent enhanced propulsion in freely swimming jellyfish. 71th Meeting of the American Physical Society Division of Fluid Dynamics Meeting, Nov 18-20, Atlanta, GA. [\[Abstract\]](#) [Talk]
12. **Xu N.W.***, Dabiri J.O. 2018. Spatiotemporal control of jellyfish swim muscle excitation. Stanford Bioengineering Retreat, Nov 5-6, Santa Cruz, CA. [Poster]
11. **Xu N.W.***, Dabiri J.O. 2018. External control of jellyfish swimming. 18th U.S. National Congress for Theoretical and Applied Mechanics, Jun 4-9, Chicago, IL. [\[Program\]](#) [Talk]
10. **Xu N.W.***, Dabiri J.O. 2018. Spatiotemporal control of jellyfish swimming. Stanford Environmental Fluid Mechanics Laboratory Seminar, Apr 5, Stanford, CA. [Talk]
9. **Xu N.W.***, Dabiri J.O. 2018. External control of jellyfish swimming and validation of turning kinematics. Society for Integrative and Comparative Biology Annual Meeting, Jan 3-7, San Francisco, CA. [\[Abstract\]](#) [Talk]
8. **Xu N.W.***, Dabiri J.O. 2017. Characterization of jellyfish turning using 3D-PTV. 70th Meeting of the American Physical Society Division of Fluid Dynamics Meeting, Nov 19-21, Denver, CO. [\[Abstract\]](#) [Talk]
7. **Xu N.W.***, Dabiri J.O. 2017. External control of jellyfish swimming and validation of turning kinematics using 3D particle tracking velocimetry (3D-PTV). Stanford Bioengineering Retreat, September 17-18, Santa Cruz, CA. [Talk]
6. **Xu N.W.***, Dabiri J.O. 2017. External control of jellyfish swimming and characterization of swim phase using 3D particle tracking velocimetry. Stanford Environmental Fluid Mechanics Laboratory Seminar, Apr 13, Stanford, CA. [Talk]
5. **Xu N.W.***, Dabiri J.O. 2017. External control of jellyfish swimming and validation using 3D particle tracking velocimetry. Stanford Bioengineering Retreat, Feb 10-12, Santa Cruz, CA. [Talk]
4. **Xu N.W.***, Dabiri J.O. 2016. Simultaneous measurements of jellyfish bell kinematics and

flow fields using PTV and PIV. 69th Meeting of the American Physical Society Division of Fluid Dynamics Meeting, Nov 20-22, Portland, OR. [\[Abstract\]](#) [\[Talk\]](#)

3. **Xu N.W.***, Dabiri J.O. 2016. How pacemaker numbers affect swimming behavior in jellyfish. Society for Integrative and Comparative Biology Annual Meeting, Jan 3-7, Portland, OR. [\[Abstract\]](#) [\[Talk\]](#)
2. Cho M.*, Koch E., Lautman M., **Xu N.W.*** 2014. VITAL: Continuous noninvasive data acquisition system to monitor cardiovascular health. [Institute for Translational Medicine and Therapeutics \(ITMAT\) Symposium](#), Penn Medicine Smilow Center for Translational Research Entrepreneurs Forum, Feb 3, Philadelphia, PA. [\[Talk\]](#)
1. Cho M.*, Koch E.*, Lautman M., **Xu N.W.*** 2014. VITAL: Continuous noninvasive data acquisition system to monitor cardiovascular health. [Intel-Cornell Cup USA](#), May 1-3, Orlando, FL. [\[Team Summary\]](#) [\[Talk\]](#)

*Presenters

University Service

Robotics Faculty Search Committee	2024-2025
Search committee member for the robotics search	
Graduate Committee	2023-Present
Spring 2023, Fall 2023, Spring 2024, Fall 2024, Spring 2025	
Committee Member	2023-Present
Leo Beuken, Defense, Advisor: J. Sean Humbert	2024
Comprehensive Exam	2023
Alexander Hedrick, Research Preliminary Exam, Advisor: Kaushik Jayaram	2024
Prashant Kunjam, Research Preliminary Exam, Advisor: Francois Barthelat	2024
ME and Robotics Faculty Searches	2023-2024
Active participant in all 11 faculty interviews in ME and 1 faculty interview in CS on campus, including individual meetings and dinners with multiple candidates	
Zoom interviewer for two potential candidate in the Robotics Program and ME	
Womxn in Mechanical Engineering Panel and Discussion	2023
Panelist featuring distinguished womxn in ME	
Research Info Session: Biomedical, Systems Design, and Robotics	2023
Presenting on department research in robotics	
Preliminary examiner	2023
Examiner for students in fluid dynamics	
ME faculty search	2023
Zoom interviewer for a potential candidate in ME/Aero	

External Service

- Guest editor
npj Robotics, Collection “Bio-inspired Underwater Robots” [\[Link\]](#)
- Workshop organizer: Bio-inspired, Biomimetics, and Biohybrid (Cyborg) Systems
 IEEE/RSJ IROS 2024 Workshop, October 15, 2024, Abu Dhabi National Exhibition Centre, Abu Dhabi.

Co-Organizers: Yao Li, Hirotaka Sato, Cristina Piazza, Ritu Raman, Liang Li, T. Thang Vo-Doan, Thanh Nho Do, Toshio Fukuda, Pablo Valdivia y Alvarado, Shinjiro Umezu, Tahmid Latif, Kan Shoji, Edoardo Milana, David Zarrouk, Pierre-Alexis Mouthuy, Qing Shi, Hongying Zhang, Nicole W. Xu, Nenggan Zheng
<https://3bio2024.wordpress.com/>

Symposium organizing committee: Rocky Mountain Fluid Mechanics Research Symposium
9th Annual Rocky Mountain Fluid Mechanics Research Symposium (RMFM), August 6, 2024, Boulder, CO USA.

Lead Organizers: John Farnsworth, Kelsea Souders, Nils Tilton

Organizing Committee: Michael Calvisi, Marc Day, Ciprian Dumitrache, Peter Hamlington, Sarah Morris, Matthew Munson, Jurgen Seidel, Bradford Smith, Brennan Sprinkle, Bret Windom, Nicole Xu

<https://rockymountainfluids.org/>

Workshop organizer: Soft Robotics-Inspired Biology

7th IEEE International Conference on Soft Robotics (RoboSoft), April 14-17, 2024, San Diego, CA USA. The workshops will be held on Sunday, April 14th

Co-Organizers: Kaushik Jayaram, Jean-Michel Mongeau, Victoria Webster-Wood, Nicole Xu

<https://www.colorado.edu/lab/jayaram/RoboSoft2024>

Minisymposia organizer: The Stories of Women in Fluids

76th Meeting of the American Physical Society Division of Fluid Dynamics, November 19-21, 2023, Washington, D.C.

Co-Organizers: Roni Goldshmid, Kelli Hendrickson, Swathi Krishna, Beverley McKeon, Banafsheh Seyed-Aghazadeh, Nicole Xu

Grant reviewer

Spark (Rapid funding of novel and unconventional ideas), Swiss National Science Foundation

One review in Fall 2023

One review in Spring 2024

Travel grant reviewer

BISCCIT: Bio-Inspired Sensing, Computing, and Control International Teams, Travel Exchange Program, Fall 2022

Guest editor

Journal of Visualized Experiments, Methods Collection “Methods in bioinspired and biohybrid robotics” [\[Link\]](#)

Peer reviewer

Animals

Biofabrication

Bioinspiration & Biomimetics

Biomimetics

Control Applications in Marine Systems, Robotics, and Vehicles

Electronics

Energies

Frontiers in Marine Science

IEEE Robotics and Automation Letters

Journal of Autonomous Vehicles and Systems

Journal of Fluids and Structures

Journal of Marine Science and Engineering

Journal of Micro and Bio Robotics
Living Machines
Machines
Micromachines
Physical Review Fluids
Proceedings of the National Academy of Sciences of the United States of America
IEEE Robotics and Automation Letters
Science Robotics
Sensors
Sensors and Actuators B: Chemical
Soft Robotics
Symmetry

Selected Media and Press Coverage

76. Feature in the cover article of **American Scientist**, July-August 2024. [Link](#)
75. Blog article in the blog associated with the journal **Integrative and Comparative Biology**, Jan 2024. [Link](#)
74. Article in **Nature Outlook: Robotics and artificial intelligence**, Dec 2023. <https://doi.org/10.1038/d41586-023-03801-0> [\[Link\]](#)
73. Stories of Women in Fluids (SoWiF) anthology series feature in **APS News**, Sept 2023. [\[Link\]](#)
72. Stories of Women in Fluids (SoWiF) anthology series feature in the **APS DFD Newsletter**, Summer 2023. [\[Link\]](#)
71. Interview on the **Physics World Weekly** podcast, IOP, 24 Mar 2022. [\[Link\]](#)
70. Interview on **The Federal Drive** with Tom Temin, Federal News Network, 14 Jun 2021. [\[Link\]](#)
69. Interview and feature on **Faculti.net**, 3 Jun 2021. [\[Link\]](#)
68. Press release in the **U.S. Navy News and Media**, 6 May 2021. [\[Link\]](#)
67. Press release in the **U.S. NRL News and Media**, 6 May 2021. [\[Link\]](#)
66. Feature in *Pipeline* for the **U.S. Naval Research Laboratory**, 6 May 2021.
65. Feature in *The Dish*, Vol 2, Issue 15, for the **U.S. NRL**, 6 May 2021.
64. Feature in *The Dish*, Vol 2, Issue 9, for the **U.S. NRL**, 17 Mar 2021.
63. YouTube interview with **Adam M.A. Simpson**, 12-13 Mar 2021. [\[Link to Part 1\]](#) [\[Part 2\]](#)
62. Feature on social media for the **U.S. Naval Research Laboratory**, 8 Mar 2021.
61. Interview on BBC Radio/Podcast - **Digital Planet**, 23 Feb 2021. [\[Link to audio\]](#)
60. Article in **GEO kompakt**, German magazine, 2021. [\[Link to publication issue\]](#)
59. Article reference in **The New York Times**, 7 Jan 2021. [\[Link to article\]](#)
58. Article in **Caltech News**, 2020: A Year in Review, 17 Dec 2020. [\[Link to article\]](#)
57. Feature in **UC Santa Cruz Science Notes**, 29 Oct 2020. [\[Link to article\]](#) [\[Link to video feature and interview\]](#)
56. Dance inspiration for **Mathilde Gilhet**, Associate Artistic Director of On Board(hers) and professional dancer and dance instructor, 29 Oct 2020. [\[Link to video\]](#)
55. Article in **Science and the Sea**, 12 Jul 2020. [\[Link to article and audio\]](#)
54. Video feature in the German TV quiz show **Genial oder daneben**, 2020.
53. Video feature on **SciShow**, hosted by Hank Green, 16 May 2020. [\[Link to video\]](#)
52. Article in **Ripley's Believe It or Not!**, 18 Mar 2020. [\[Link to article\]](#)

51. Article by sci-fi thriller writer **R. E. Kearney**, 5 Mar 2020. [\[Link to article\]](#)
50. Interview and article in **Digi.no**, 27 Feb 2020. [\[Link to article\]](#)
49. Article in **IGN**, 24 Feb 2020. [\[Link to article\]](#)
48. Article in **Medical Daily**, 24 Feb 2020. [\[Link to article\]](#)
47. Article in **Tech Times**, 24 Feb 2020. [\[Link to article\]](#)
46. Live interview on BYU Radio - **Constant Wonder** (Sirius XM), 18 Feb 2020. [\[Link to audio\]](#)
45. Interview and video feature in CNET's **What the Future**, 14 Feb 2020. [\[Link to video\]](#)
44. Live interview on **BBC World News TV** - Global with Matthew Amroliwala, 12 Feb 2020. [\[Link to video\]](#)
43. Article in **Marine Madness**, 13 Feb 2020. [\[Link to article\]](#)
42. Article in the **World Economic Forum**, 13 Feb 2020. [\[Link to article\]](#)
41. Article in **Owl Connected**, a news site for children, 10 Feb 2020. [\[Link to article\]](#)
40. Interview and video feature on **Ruptly**, 8 Feb 2020. [\[Link to video\]](#)
39. Interview and video feature on **CBS** Los Angeles TV, 6 Feb 2020. [\[Link to video\]](#)
38. Interview and video feature on **FOX KTVU** TV, 5 Feb 2020. [\[Link to video\]](#)
37. Interview and video feature on **CBS** Sacramento TV, 5 Feb 2020. [\[Link to video\]](#)
36. Interview and video feature on KPIX **CBS** SF Bay Area TV, 5 Feb 2020. [\[Link to video\]](#)
35. Article in **Mercury News**, 5 Feb 2020. [\[Link to article\]](#)
34. Article in **The Sacramento Bee**, 5 Feb 2020. [\[Link to article\]](#)
33. Article in **Soundings Online**, 5 Feb 2020. [\[Link to article\]](#)
32. Media coverage for the **Stanford Law School**, 5 Feb 2020. [\[Link to article\]](#)
31. Video feature in the German TV quiz show **Wer weiss denn sowas?** ('Who knew?'), 2020.
30. Article, audio, and classroom activities for children in **Kids News**, 2 Feb 2020. [\[Link\]](#)
29. Article in **Dual Dove**, 1 Feb 2020. [\[Link to article\]](#)
28. Spotlight interview with **Stanford Engineering** media, Feb 2020. [\[Link to interview\]](#)
27. Interview on CBC Radio and Podcast - **Quirks & Quarks**, 31 Jan 2020. [\[Link to audio\]](#)
26. Canadian Broadcasting Corporation **CBC Kids News**. [\[Link to feature\]](#)
25. Article in **Popular Science**, 31 Jan 2020. [\[Link to article\]](#)
24. Article in **ZME Science**, 31 Jan 2020. [\[Link to article\]](#)
23. Article in **IFL Science**, 31 Jan 2020. [\[Link to article\]](#)
22. Article in **Digital Trends**, 31 Jan 2020. [\[Link to article\]](#)
21. Article in the **Toronto Sun**, 31 Jan 2020. [\[Link to article\]](#)
20. Article in the **Institution of Engineering and Technology**, 31 Jan 2020. [\[Link to article\]](#)
19. Article in **The Burn-In**, 31 Jan 2020. [\[Link to article\]](#)
18. Article in **The Economist**, 30 Jan 2020. [\[Link to article\]](#)
17. Article in **Reuters**, 30 Jan 2020. [\[Link to article and video\]](#)
16. Article in **Gizmodo**, 30 Jan 2020. [\[Link to article\]](#)
15. Article in **Inverse**, 30 Jan 2020. [\[Link to article\]](#)
14. Article in **Advanced Science News**, 30 Jan 2020. [\[Link to article\]](#)
13. Article in **Hackster.io**, 2020. [\[Link to article\]](#)
12. Article in **New Scientist**, 29 Jan 2020, 30 Jan 2020. [\[Link to article\]](#) [\[Link to video\]](#)
11. Article in **CNET**, 29 Jan 2020. [\[Link to article\]](#)
10. Article in **Futurism**, 29 Jan 2020. [\[Link to article\]](#)
9. Article in **New Atlas**, 29 Jan 2020, 30 Jan 2020. [\[Link to article\]](#)
8. Article in **Discover Magazine**, 29 Jan 2020. [\[Link to article\]](#)

7. Article in **IEEE Spectrum**, 29 Jan 2020. [[Link to article](#)]
6. Article in **Cosmos Magazine**, 29 Jan 2020. [[Link to article](#)]
5. Article in **Newsweek**, 29 Jan 2020. [[Link to article](#)]
4. Article in **National Geographic España**, 29 Jan 2020. [[Link to article](#)]
3. Article in **Wired**, 29 Jan 2020. [[Link to article](#)]
2. Article in **Scientific American**, 29 Jan 2020. [[Link to article](#)]
1. Article in **Caltech News**, 29 Jan 2020. [[Link to article and video](#)]

Teaching Experience

- University of Colorado Boulder**, MCEN 4045: Senior Design Project 1 Fall 2024
 Faculty Director for three teams: IEQmax for optimal air quality performance in agricultural production environments, transcanal endoscopic cochlear implantation (TECI) instrument for Children's Hospital Colorado, removable electrode for post-operative nerve stimulation for Children's Hospital Colorado
- University of Colorado Boulder**, MCEN 4085: Senior Design Project 2 Spring 2024
 Faculty Director for three teams: Army Research Office DEVCOM, Quality of Life Plus Dragon Boat, and Terumo Blood and Cell Technologies
- University of Colorado Boulder**, MCEN 4045: Senior Design Project 1 Fall 2023
 Faculty Director for three teams: Army Research Office DEVCOM, Quality of Life Plus Dragon Boat, and Terumo Blood and Cell Technologies
- University of Colorado Boulder**, MCEN 4195/5195: Bioinspired Robotics Fall 2023
 Upper-level undergraduate and graduate course including a final project to build a robot
- Stanford University**, [BioE 141B: Bioengineering Senior Capstone Design II](#) Winter 2018
Teaching Assistant
 Faculty: Professors David Camarillo, Bo Wang; Ross Venook; Kara Rogers
- Stanford University**, [BioE 141A: Bioengineering Senior Capstone Design I](#) Fall 2016
Teaching Assistant
 Faculty: Professors David Camarillo; Ross Venook; Kara Rogers
- University of Pennsylvania**, [BE 350: Transport Processes in Living Systems](#) Spring 2014
Teaching Assistant
 Faculty: Professors Arjun Raj, Dongeun (Dan) Huh
- University of Pennsylvania**, [Center for Programs in Contemporary Writing](#) Spring-Fall 2013
Critical Writing Tutor
 Trained Fall 2012 by [Dr. Valerie Ross, Director of the Critical Writing Program](#)
 Writing in the Disciplines Project: Created a writing guide for student and professional writing in Mechanical Engineering and Applied Mechanics

Leadership, Community Service, and Activities

- [Stories of Women in Fluids Initiative \(SoWiF\)](#) 2022-Present
 Leadership Committee, project to write and publish two anthology books about women who study fluid dynamics and STEM to broader audiences
 Career Anthology Content Committee
 Career Anthology Author

Leadership Education for Advancement and Promotion (LEAP) Program	2024
Participation in a two-day on-campus workshop, May 14-15	
U.S. Naval Research Laboratory, Women in Science and Engineering	2022-2023
Participant	
American Physical Society, Advancing Graduate Leadership (AGL) Conference	2022
Participant, application selected for attendance (200 total attendees, women and gender minority graduate and postdoctoral students), Washington, D.C., Aug 4-5	
Skype a Scientist	2020-Present
Volunteer Scientist	
National Center for Faculty Development and Diversity	2020-Present
Member	
Stanford University, Stanford Women in Fluid Dynamics	2016-2020
<i>Collaborations with Stanford's Women in Science and Engineering, Mechanical Engineering Women's Group, and Women in Aeronautics & Astronautics</i>	
President	2017-2019
Vice President	2016-2017, 2019-2020
Stanford University, Stanford Aerobics & Yoga	2015-2020
President	2018-2019
Vice President	2017-2018
Cardio Dance, Zumba Instructor	2016-2020
Stanford University, Women in Science and Engineering	2016-2020
Participant	
Stanford University, Dabiri Lab Safety Coordinator	2016-2020
University of Pennsylvania, Benjamin Franklin Scholars	2010-2014
President	2013-2014
Executive Board Member	2011-2013
Participant	
University of Pennsylvania, Engineers in Medicine (eMED)	2011-2014
Executive Board Chair	2011-2014
Participant	

Professional Affiliations

[American Physical Society](#)
[Association for Women in Science](#)
[IEEE Robotics and Automation Society](#)
[Sigma Xi](#)
[Society of Integrative and Comparative Biology](#)
[Tau Beta Pi National Engineering Honor Society](#) [Invited]

Computer Skills

Arduino; Adobe InDesign; Adobe Photoshop; ANSYS APDL; ANSYS Workbench; CL-Quant;
 C++; Composer; COMSOL; DaVis; GrabCAD; GraphPad; IC Capture; ImageJ; IMPERX
 BOBCAT Cam Configurator and FrameLink Express; LaTeX; LoggerPro; MATLAB; MeshLab;
 OnShape; Python; Q Capture Pro; QuarkXPress; SolidWorks; TSI Insight

Equipment Skills

ARES-G2 Rheometer; Asiga PICO2 HD Digital Light Processing 3D Printer; Inverted Zeiss LSM 780 Multiphoton Laser Scanning Confocal Microscope; Leica DM6000B Microscope and Q Imaging Retiga 4000R Camera; Nikon BioStation CT; Phrozen Mega 8K 3D Printer; Spectrophotometer and microplate readers; Stratasys J750 PolyJet 3D Printer

Certifications

Laser Safety Training, U.S. Naval Research Laboratory	2021-2023
Laser Safety Training, Stanford University	2016-2020
Bloodborne Pathogens, Stanford University	2016-2020
Adult, Child, and Infant Cardiopulmonary Resuscitation (CPR)	2016-2020
Licensed Zumba ZIN Fitness Instructor	2016-2020