

Monica Martinez Wilhelmus

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School of Engineering, Center for Fluid Mechanics
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PROFESSIONAL EXPERIENCE

Thomas J. and Alice M. Tisch Assistant Professor of Engineering School of Engineering Brown University, Providence, RI	2021 - PRESENT
Affiliated Assistant Professor Mechanical Engineering University of California Riverside, Riverside, CA	2021 - PRESENT
Assistant Professor Mechanical Engineering University of California Riverside, Riverside, CA	2016 - 2021
Affiliated Scientist Earth Science NASA Jet Propulsion Laboratory, Pasadena, CA	2016 - 2020
Postdoctoral Scholar California Institute of Technology, Pasadena, CA Jet Propulsion Laboratory, Pasadena, CA	2015 - 2016

EDUCATION

Ph.D. Mechanical Engineering California Institute of Technology, Pasadena, CA	2010 - 2016
M.S. Mechanical Engineering California Institute of Technology, Pasadena, CA	2010 - 2012
B.S. Mechanical Engineering Universidad Nacional Autonoma de Mexico, Mexico D.F., Mexico	2005 - 2010

FELLOWSHIPS, HONORS & AWARDS

Young Investigator Program Award Office of Naval Research, Science and Technology	2024
Thomas J. and Alice M. Tisch Endowed Chair Brown University, Providence, RI	2023
George E. Brown, Jr. Award UC MEXUS, Riverside, CA	2018
UCR Regents Faculty Fellowship University of California Riverside, Riverside, CA	2017
Mechanical Engineering Option Fellowship California Institute of Technology, Pasadena, CA	2010
UNAM Research Fellowship PAPIIT Universidad Nacional Autonoma de Mexico, Mexico City, Mexico	2010

PUBLICATIONS

Students and postdocs underlined

1. Tack N, Oliveira Santos S, Gemmell B, **Wilhelmus MM**, “Ups and downs: Copepods reverse the near-body flow to cruise in the water column”, *Proceedings of the National Academy of Sciences*, *in review*.
2. Watkins D, Bliss A, Hutchings J, **Wilhelmus MM** (2023) “Evidence of abrupt transitions between sea ice dynamical regimes in the East Greenland marginal ice zone”, *Geophysical Research Letters*, *50*: e2023GL103558..
3. Oliveira Santos S, Su Y, Tack N, Cuenca-Jimnez F, Gomez-Valdez P. Antonio, Morales-Lopez O, **Wilhelmus MM** (2023) “Pleobot: a modular robotic solution for metachronal swimming”, *Scientific Reports*, *13*: 9574.
4. Su Y, **Wilhelmus MM**, Zenit R (2023) “Asymmetry of motion: Vortex rings crossing a density gradient”, *Journal of Fluid Mechanics*, *960*:R1.
5. Covington J, Chen N, **Wilhelmus MM** (2022) “Bridging gaps in the climate observation network: A physics-based nonlinear dynamical interpolation of Lagrangian ice floe measurements via data-driven stochastic models”, *Journal of Advances in Modeling Earth Systems* *14*: e2022MS003218.
6. Manucharyan GE, Lopez-Acosta R, **Wilhelmus MM** (2022) “Western Arctic Ocean turbulence revealed by rotating ice floes”, *Scientific Reports*, *12*: 7070.
7. Sulpis O, Humphreys MP, **Wilhelmus MM**, Carroll D, Berelson WM, Menemenlis D, Middelburg JJ, Adkins JF (2022) “RADiv1: a non-steady-state early diagenetic model for ocean sediments in Julia and MATLAB/GNU Octave”, *Geoscientific Model Development*, *15*: 2105–2131.
8. Rage G, Atasi O, **Wilhelmus MM**, Hernandez-Sanchez JF, Haut B, Scheid B, Legenre D, Zenit R (2020) “Bubbles determine the amount of alcohol in Mezcal”, *Scientific Reports*, *10*: 11014.
9. **Wilhelmus MM**, Nawroth JC, Bhargav R, Dabiri JO (2020) “Effect of swarm configuration on fluid transport during vertical collective motion”, *Bioinspiration & Biomimetics* *15*: 015002.
10. Palacios-Muniz B, Rosario A, **Wilhelmus MM**, Zetina S, Zenit R, (2019) “Pollock avoided hydrodynamic instabilities to paint with his dripping technique”, *PLoS ONE* *14*(10): e0223706.
11. Lopez-Acosta R, Schodlok M, **Wilhelmus MM** (2019) “Ice floe tracker: An algorithm to automatically retrieve Lagrangian trajectories via feature matching from moderate-resolution visual imagery”, *Remote Sensing of Environment* *234*: 111406.
12. Peck RA, Bahena E, Jahan R, Aguilar G, Tsutsui H, Princevac M, **Wilhelmus MM**, Rao MP (2018) “Meso-scale particle image velocimetry studies of neurovascular flows in vitro”, *Journal of Visualized Experiments* *142*: e58902.
13. **Wilhelmus MM**, Dabiri JO (2014) “Observations of large-scale fluid transport by laser-guided plankton aggregations”, *Physics of Fluids* *26*: 101302.

In preparation (manuscript available upon request):

- Ahmed A, Fox-Kemper B, Wexler D, **Wilhelmus MM**, “Exploring Seasonal to Annual Sea Surface Temperature Variability Patterns in Narragansett Bay from Landsat imagery”, *Remote Sensing of Environment*.
- Watkins D, Lopez-Acosta R, Kim M, **Wilhelmus MM**, “Sea ice dispersion mirrors underlying submesoscale ocean currents amid strong atmospheric forcing”, *Nature Communications*.
- Watkins D, Lopez-Acosta R, Bliss A, Hutchings J, **Wilhelmus MM**, “Lagrangian statistics of in-situ and remote sensing sea ice observations in the Spring- and Summer-time Marginal Ice Zones”, *The Cryosphere*.

AWARDED RESEARCH GRANTS

Brown University, 2024 Hazeltine Innovation Award “The Fluid Mechanics of Breastfeeding” PI: Wilhelmus; Total Budget: \$99,997	2023 - 2024
Department of Energy “Synoptic and Mesoscale Modulation of Dynamic and Thermodynamic Impacts on Central Arctic Sea Ice During MOSAiC” co-PI: Wilhelmus, DE-SC0021342; Total budget: \$28,098	2023 - 2024
ONR, Arctic Program “Towards a Dynamical Description of the Sea Ice Field” PI: Wilhelmus, N00014-22-1-2722; Total budget: \$415,005	2022 - 2024
ONR, Arctic Program “Characterization of the oceanic mesoscale eddy field from Lagrangian statistics of ice floes acquired via optical remote sensing imagery” PI: Wilhelmus, N00014-22-1-2741; Total budget: \$150,000	2022 - 2023
NASA, RI EPSCoR Seed Grant Program “An Intelligent Robotic Platform for Ocean Exploration” PI: Wilhelmus; Total Budget: \$27,000	2022 - 2023
NOAA, Small Business Innovation Research (SBIR) “Intelligent Climate Evaluations Concerning Arctic Passages (ICECAP)” Co-PI: Wilhelmus; Award withdrawn by PI; Total budget: \$25,000	2022 - 2025
Brown University, Research Seed Award “Engineering a New Generation of Bio-inspired Autonomous Underwater Robotic Sensors” PI: Wilhelmus; Total Budget: \$47,000	2022 - 2023
NASA, The Science of Terra, Aqua, and Suomi-NPP Program “A New Sea Ice Drift Product for Terra and Aqua MODIS Remote Sensing Imagery” PI: Wilhelmus, 20-TASNPP20-0202; Total budget: \$562,983	2022 - 2025
NASA, Ocean Biology and Biogeochemistry Program “Ecosystem Engineers: The Role of Diel Vertical Migrators in Redistributing Marine Biogeochemical Properties” PI: Wilhelmus, 20-OBB20-0079; Total budget: \$753,044	2021 - 2024
ONR, MURI Program “Mathematics and Data Science for Improved Physical Modeling and Prediction of Arctic Sea Ice” Co-PI: Wilhelmus, N00014-19-1-2421; Total budget: \$125,005	2021 - 2024
ONR, Arctic Program “Inferring Ocean Turbulence Characteristics from Lagrangian Measurements of Sea Ice Acquired via Remote Sensing Imagery” PI: Wilhelmus, N00014-20-1-2753; Total budget: \$279,936	2020 - 2024
The University of California Institute for Mexico and the United States “Engineering a New Generation of Underwater Robots” PI: Wilhelmus, CN-18-138; Total Budget: \$30,000	2019 - 2020
UCR, Seed Grants “Engineering a New Generation of Cooperative, Autonomous, and Bio-inspired Underwater Vehicles” PI: Wilhelmus; Total Budget: \$15,000	2018 - 2019

INVITED LECTURES

Towards a unifying theory of metachronal swimming

Department of Ecology, Evolution and Organismal Biology, Brown University, Providence, RI 03/21/2023

Tracing the New Arctic

Ocean and Cryosphere, Jet Propulsion Laboratory, Pasadena, CA 03/07/2023

Guggenheim Aeronautical Laboratory, California Institute of Technology, Pasadena, CA 03/03/2023

Earth System Science, Stanford University, Stanford, CA 02/23/2023

Institute for Mathematical and Statistical Innovation, University of Chicago, Chicago, IL 12/02/2022

Invited Lecture, 75th Annual Meeting APS DFD, Indianapolis, IN 11/20/2022

Center for Environmental and Applied Fluid Mechanics, Johns Hopkins University, Baltimore, MD 10/14/2022

Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, Boston, MA 03/10/2022

Environmental Science and Engineering, California Institute of Technology, Pasadena, CA 10/27/2021

Mechanical Engineering, University of California Santa Cruz, Santa Cruz, CA 05/03/2021

Oceanography, Humboldt State University, Arcata, CA 04/30/2021

Physical Oceanography, University of Washington, Seattle, WA 04/21/2021

Marine and Coastal Sciences, Rutgers University, Newark, NJ 03/29/2021

Center for Fluid Mechanics, Brown University, Providence, RI 03/02/2021

Lagrangian sea ice trajectories from optical remote sensing imagery

ONR MURI Annual Meeting - Mathematics and Data Science for Improved Physical Modeling and Prediction of Arctic Sea Ice, Online 08/28/2020

Ocean acidification: Towards a better understanding of calcite dissolution

Center for Fluid Mechanics, Stanford University, Stanford, CA 07/11/2017

Fluid transport by small swimming organisms

Aerospace and Mechanical Engineering, University of Southern California, Los Angeles, CA 10/31/2018

Mechanical Engineering, University of California Riverside, Riverside, CA 10/21/2016

Scripps Institution of Oceanography, University of California San Diego, San Diego, CA 03/01/2016

Mechanical Engineering, University of California Santa Barbara, Santa Barbara, CA 12/02/2015

Ocean and Cryosphere, Jet Propulsion Laboratory, Pasadena, CA 01/26/2015

Biogenic ocean mixing

Mechanical Engineering, University of California Riverside, Riverside, CA 10/31/2014

CONFERENCE PROCEEDINGS

Students underlined

1. Watkins, D, Kim, M, Buckley, E, **Wilhelmus MM** (2023) A new sea ice drift product for optical remote sensing imagery, *International Glaciological Society Symposium on Sea Ice*, Bremerhaven, Germany.
2. Watkins, D, Kim, M, Buckley, E, **Wilhelmus MM** (2023) Tracking ice floes from space, *National Oceanic and Atmospheric Administration Sea Ice Modeling Workshop*, Boulder, CO.
3. Kostadinov T, Taniguchi D, **Wilhelmus MM**, Carroll D, Meiburg E, Su Y, O'Malley RT, Behrenfeld M (2022) Quantification of zooplankton diel vertical migration via ocean color retrievals of the particle size distribution, *Bulletin of the American Geophysical Union Annual Fall Meeting*, Chicago, IL.
4. Covington J, Chen N, **Wilhelmus MM** (2022) Bridging gaps in the climate observation network: A physics-based nonlinear dynamical interpolation of Lagrangian ice floe measurements via data-driven stochastic models, *Bulletin of the American Geophysical Union Annual Fall Meeting*, Chicago, IL.
5. Newcomb B, Kim M, Timmermans M-L, **Wilhelmus MM** (2022) Surface drifter and sea ice observations for characterizing mesoscale eddies in the Arctic Ocean, *Bulletin of the American Geophysical Union Annual Fall Meeting*, Chicago, IL.

6. Buckley E, **Wilhelmus MM** (2022) Examining the relationship between sea ice dynamics and floe characteristics in the marginal ice zone, *Bulletin of the American Geophysical Union Annual Fall Meeting*, Chicago, IL.
7. Watkins D, Bliss A, Hutchings J, **Wilhelmus MM** (2022) Sea ice dynamics in the East Greenland Sea marginal ice zone during summer, *Bulletin of the American Geophysical Union Annual Fall Meeting*, Chicago, IL.
8. Kim M, Convington J, Montemuro B, Manucharyan G, Chen N, **Wilhelmus MM** (2022) Synthesis of MODIS Satellite Imagery, Sea Ice Tracking, and Ocean Turbulence Model for Characterizing Arctic Ocean Eddies, *Bulletin of the American Geophysical Union Annual Fall Meeting*, Chicago, IL.
9. **Wilhelmus MM** (2022) Tracing the New Arctic: Is drifting sea ice a vorticity meter of the ocean?, *Bulletin of the American Physical Society Division of Fluid Dynamics 75th Annual Meeting*, Indianapolis, IN.
10. Su Y, Weinbaum R, Kostadinov T, Meiburg E, Carroll D, Taniguchi D, **Wilhelmus MM** (2022) Diel vertical migration of mesozooplankton: Large mixing by small animals?, *Bulletin of the American Physical Society Division of Fluid Dynamics 75th Annual Meeting*, Indianapolis, IN.
11. Kim M, Montemuro B, Convington J, Manucharyan G, Chen N, **Wilhelmus MM** (2022) A new framework to characterize Arctic Ocean eddies leveraging Lagrangian observations of sea ice, *Bulletin of the American Physical Society Division of Fluid Dynamics 75th Annual Meeting*, Indianapolis, IN.
12. Ahmed A, Wexler D, Davidson L, Fox-Kemper B, **Wilhelmus MM** (2022) Seasonal evolution of environmental indicators in Narragansett Bay, *Bulletin of the American Physical Society Division of Fluid Dynamics 75th Annual Meeting*, Indianapolis, IN.
13. Tack N, **Wilhelmus MM** (2022) Swimming isn't such a drag: How the coalescence and flexibility of shrimp pleopods minimize drag during metachronal swimming, *Bulletin of the American Physical Society Division of Fluid Dynamics 75th Annual Meeting*, Indianapolis, IN.
14. Santos SO, Tack N, **Wilhelmus MM** (2022) RoboKrill: the role of morphology on thrust production during metachronal swimming, *Bulletin of the American Physical Society Division of Fluid Dynamics 75th Annual Meeting*, Indianapolis, IN.
15. Santos SO, Su Y, **Wilhelmus MM** (2022) Robokrill: Pleopod morphology and vortex generation during drag-based metachronal swimming, *Bulletin of the 19th U.S. National Congress on Theoretical and Applied Mechanics*, Austin, TX.
16. Su Y, Meiburg E, Taniguchi D, Kostadinov T, Carroll D, **Wilhelmus MM** (2022) Mesozooplankton migration: Turbulent bio-mixing as ecosystem engineers, *Bulletin of the 19th U.S. National Congress on Theoretical and Applied Mechanics*, Austin, TX.
17. **Wilhelmus MM**, Lopez-Acosta R, Hutchings J, Bliss A (2022) Retrieving the characteristics of oceanic turbulence from sea ice dispersion metrics, *Bulletin of the Ocean Sciences Meeting*, Online.
18. Convington J, Chen N, **Wilhelmus MM**, Lopez-Acosta R (2022) Estimating missing observations of ice floes using data assimilation, *Bulletin of the Ocean Sciences Meeting*, Online.
19. Manucharyan G, Lopez-Acosta R, **Wilhelmus MM** (2022) Spinning ice floes reveal intensification of mesoscale eddies in the western Arctic Ocean, *Bulletin of the Ocean Sciences Meeting*, Online.
20. Su Y, **Wilhelmus MM**, Kostadinov T, Meiburg E, Carroll D, Taniguchi D (2022) Vertical mesozooplankton migrators as ecosystem engineers, *Bulletin of the Ocean Sciences Meeting*, Online.
21. Oliveira Pedro dos Santos S, Gomez Valdez A, Morales Lopez O, Cuenca-Jimnez F, Di Santo V, **Wilhelmus MM** (2022) Robokrill: a robotic platform for characterization of drag-based metachronal swimming, *Bulletin of the Ocean Sciences Meeting*, Online.
22. Lopez R, **Wilhelmus MM** (2021) Sea ice dispersion mirrors underlying submesoscale ocean currents amid strong atmospheric forcing, *Bulletin of the American Physical Society Division of Fluid Dynamics 74th Annual Meeting*, Phoenix, AZ.

23. Lopez R, Manucharyan GE, **Wilhelmus MM** (2020) Emerging Arctic Ocean turbulence revealed by rotating sea ice floes, *Bulletin of the American Physical Society Division of Fluid Dynamics 73rd Annual Meeting*, Chicago, IL.
24. Santos SO, Gomez Valdez A, Morales Lopez O, Cuenca-Jimenez F, Di Santo V, **Wilhelmus MM** (2020) Robokrill: understanding vortex generation during drag-based metachronal swimming, *Bulletin of the American Physical Society Division of Fluid Dynamics 73rd Annual Meeting*, Chicago, IL.
25. Lopez R, **Wilhelmus MM** (2020) Ice floe dispersion from moderate remote sensing imagery, *Bulletin of the Ocean Sciences Meeting*, San Diego, CA.
26. Lopez R, **Wilhelmus MM** (2019) Ice floe dispersion from moderate remote sensing imagery, *Bulletin of the American Physical Society Division of Fluid Dynamics 72nd Annual Meeting*, Seattle, WA.
27. Juarez YS, Di Santo V, **Wilhelmus MM** (2019) Robokrill: a metachronal robotic swimmer, *Annual Bulletin of the Society of Integrative and Comparative Biology*, Tampa, FL.
28. Lopez R, Schodlok M, **Wilhelmus MM**, (2018) Ice floe dispersion from remote sensing imagery, *Bulletin of the American Physical Society Division of Fluid Dynamics 71st Annual Meeting*, Atlanta, GA.
29. Sanchez Y, Avila P, Cuenca Jimenez F, Di Santo V, **Wilhelmus MM** (2018) Robokrill: a metachronal robotic swimmer, *Bulletin of the American Physical Society Division of Fluid Dynamics 71st Annual Meeting*, Atlanta, GA.
30. Lopez R, **Wilhelmus MM**, Klein P (2017) Development of an ice floe tracker algorithm to measure Lagrangian statistics in the eastern Greenland coast, *Bulletin of the American Physical Society Division of Fluid Dynamics 70th Annual Meeting*, Denver, CO.
31. **Wilhelmus MM**, Adkins J, Menemenlis D (2016) Ocean acidification: Towards a better understanding of calcite dissolution, *Bulletin of the American Physical Society Division of Fluid Dynamics 69th Annual Meeting*, Portland, OR.
32. Rage G, Hernandez-Sanchez JF, **Wilhelmus MM** (2016) Long-life of a bubble on the surface of a water-alcohol mixture, *Bulletin of the American Physical Society Division of Fluid Dynamics 69th Annual Meeting*, Portland, OR.
33. Sanchez Y, **Wilhelmus MM** (2016) An underwater robo-leader for collective motion studies, *Bulletin of the American Physical Society Division of Fluid Dynamics 69th Annual Meeting*, Portland, OR.
34. **Wilhelmus MM**, Dabiri JO, Nawroth J (2016) A numerical study of fluid transport by migrating zooplankton aggregations, *SIAM Conference on the Life Sciences*, Boston, MA.
35. **Martinez M**, Dabiri JO, Nawroth J, Gemmell B, Collins S (2014) A hybrid numerical-experimental study of fluid transport by migrating zooplankton aggregations, *Bulletin of the American Physical Society Division of Fluid Dynamics 67th Annual Meeting*, San Francisco, CA.
36. **Martinez-Ortiz M**, Dabiri JO (2013) Local fluid transport by planktonic swarms, *Bulletin of the American Physical Society Division of Fluid Dynamics 66th Annual Meeting*, Pittsburg, PA.
37. **Martinez-Ortiz**, Dabiri JO (2012) Scalar transport by planktonic swarms, *Bulletin of the American Physical Society Division of Fluid Dynamics 65th Annual Meeting*, San Diego, CA.
38. **Martinez-Ortiz M**, Dabiri JO (2012) Laboratory studies of ocean mixing by microorganisms, *XXIII International Congress on Theoretical and Applied Mechanics*, Beijing, China.
39. Mancilla E, **Martinez-Ortiz M**, Soto E, Ascanio G, Zenit R (2011) Bubbles in an isotropic homogenous turbulent flow, *Bulletin of the American Physical Society Division of Fluid Dynamics 64th Annual Meeting*, Baltimore, MD.
40. **Martinez-Ortiz M**, Dabiri JO (2011) Laboratory studies of ocean mixing by microorganisms, *Bulletin of the American Physical Society Division of Fluid Dynamics 64th Annual Meeting*, Baltimore, MD.

41. **Martinez-Ortiz M**, Mancilla E, Zenit R (2009) Analysis of the breakup of a viscous thread in a turbulent flow, *Bulletin of the American Physical Society Division of Fluid Dynamics 62nd Annual Meeting*, Minneapolis, MN.

ATTENDED WORKSHOPS

Remote Sensing of Environment , Chicago, IL	11/2022
Microscale Ocean Biophysics , Whistler, BC	01/2019
ECCO Meeting at MIT , Boston, MA	05/2016
Microscale Ocean Biophysics , Aspen, CO	01/2015
Physical-Biological Interactions , Eilat, Israel	10/2013
New Horizons for Mexican Engineering , Montreal, Canada	10/2004

ACADEMIC LEADERSHIP

Member-at-Large, Group on the Physics of Climate ExComm American Physical Society	2024 - PRESENT
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PROFESSIONAL SERVICE

University Graduate Council Brown University	2023 - PRESENT
Engineers Without Borders Academic Adviser, School of Engineering, Brown University	2023 - PRESENT
Advisory Board of the Sheridan Teaching Center Brown University	2022 - PRESENT
Corporate Advisory Board Committee School of Engineering, Brown University	2022
Honors Committee School of Engineering, Brown University	2022
External Affairs Committee American Physical Society, Division of Fluid Dynamics	2021-2023
Diversity in Nominations Committee American Physical Society, Division of Fluid Dynamics	2017-2020
Society of Women Engineers Academic Adviser, Mechanical Engineering, University of California Riverside	2018-2020

OUTREACH ACTIVITIES

Vartan Gregorian Science Conference Vartan Gregorian Elementary	2023
Girls Get Math Program Brown University	2022 - PRESENT
Women in STEM Program California Institute of Technology	2012 - 2015

TEACHING AND MENTORING

Postdoctoral Scholars:

Minki Kim, Brown University	2022 - PRESENT
Ellen Buckley, Brown University	2022 - PRESENT
Nils Tack, Brown University	2022 - 2023
Daniel Watkins, Brown University	2022 - 2023
Yunxing Su, Brown University	2020 - 2023

Ph.D. Students:

Ross Hibbett, Brown University	2023 - PRESENT
Adam Poche, Brown University	2023 - PRESENT
Ashfaq Ahmed, Brown University	2021 - PRESENT
Sara Santos, Brown University	2019 - PRESENT
Rosalinda Lopez, UCR	2016 - 2021
Ryan Peck (co-advised), UCR	2017 - 2020

M.S. Students:

Yair Sanchez, UCR	2017 - 2019
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Undergraduate Students:

Mageean Brown, Brown University	2023 - PRESENT
Simon Hatcher, Brown University	2022 - PRESENT
Benjamin Newcomb, Brown University	2022 - PRESENT
Leela Canuelas-Puri, Brown University	2023
Zoe King, Brown University	2022
Nondi Walters, Brown University	2022
Rose Weinbaum, Brown University	2022
Jose Flores, UCR	2018 - 2019
Steven Espinosa, UCR	2017 - 2019
Scott Leach, UCR	2017 - 2019
Kevin Krause, UCR	2017 - 2018
Lorenzo Sanchez, UCR	2016 - 2018
Rod Pirniakan, UCR	2016 - 2017
Yair Sanchez, UCR	2016 - 2017

Courses:

Fluid Mechanics, Brown, ENGN0810 (undergraduate)	FALL 2023
Fluid Mechanics II, Brown, ENGN2820 (graduate)	SPRING 2023
Vibration of Mechanical Systems, Brown, ENGN1735/2735 (undergraduate and graduate)	FALL 2022
Turbulence in Fluids, UCR, ME 242 (graduate)	SPRING 2021
Fluid Mechanics, UCR, ME 113 (undergraduate)	WINTER 2021
Fluid Mechanics, UCR, ME 113 (undergraduate)	FALL 2020
Sea Ice-Ocean Interactions, UCR, ME 197 (undergraduate)	SPRING 2019
Energy and Environment, UCR, ME 004 (undergraduate)	SPRING 2019
Fluid Mechanics, UCR, ME 113 (undergraduate)	SPRING 2019
Turbulence in Fluids, UCR, ME 242 (graduate)	SPRING 2018
Fluid Mechanics, UCR, ME 113 (undergraduate)	SPRING 2018
Fundamentals of Fluid Mechanics, UCR, ME 240B (graduate)	WINTER 2018
Fundamentals of Fluid Mechanics, UCR, ME 240B (graduate)	SPRING 2017
Fluid Mechanics, UCR, ME 113 (undergraduate)	WINTER 2017