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JESSICA OEHRLEIN

education

Columbia University, Applied Physics & Applied Mathematics, New York, NY.

Ph.D., Applied Mathematics, May 2021.

M. Phil, Applied Mathematics, Oct 2019.

M.S., Applied Mathematics, May 2017.

Advisors: Lorenzo Polvani, Gabriel Chiodo.

Dissertation title: Sudden Stratospheric Warmings and Their Impact on Northern Hemisphere Winter Climate

Franklin W. Olin College of Engineering, Needham, MA.

B.S. Mechanical Engineering, May 2016.

employment

Assistant Professor, Fitchburg State University, Sept 2021-present.

Courses:

MATH 1250 SI Functions – Fall 2022

MATH 1600 Informal Mathematical Modeling – Spring 2022

MATH 1700 Applied Statistics – Fall 2021, Spring 2022, Fall 2022, Spring 2023

MATH 1900 Discrete Mathematics – Fall 2021

Math 3900 Math Seminar (Time Series) – Spring 2023

MATH 4200 Probability & Statistics I – Fall 2022

Math 4250 Probability & Statistics II – Spring 2023

Service: Department Curriculum Committee 2021-23 (chair 2022-23), Data Analytics Minor ad hoc committee (2021-23), Elizabeth Haskins Math Contest 2021-23, Department Assessment Committee 2022-23, Leading for Change Climate Survey Dissemination 2022-23, All University Policies Committee 2021-23, Crocker Center for Civic Engagement Advisory Board 2021-22.

Adjunct Lecturer, LaGuardia Community College, Mar-Dec 2020.

Courses: MAC 281 Discrete Structures, MAC 286 Data Structures

Instructor, Columbia University, Sept 2019-May 2020.

Courses: APMA E3001 Multivariable Calculus for Engineers and Applied Scientists

Instructor, Columbia University Summer Bridge Program, Jul-Aug 2019.

Courses: Introductory Statistics

publications

Note: Authorship in atmospheric science and engineering education are typically by contribution. Authorship in mathematics is typically by last name.

- Y. Yesilevskiy, A. Thomas, J. Oehrlein, M. Wright, M. Tarnow. 2022. "Introducing Experimental Design to Promote Active Learning." Presented at *American Society for Engineering Education Annual Conference & Exposition*. <https://strategy.asee.org/40871>
- J. Oehrlein, L. M. Polvani, L. Sun, C. Deser. 2021. "How well do we know the surface impact of sudden stratospheric warmings?" *Geophysical Review Letters*. doi: 10.1029/2021GL095493.
- J. Oehrlein, G. Chiodo, L. M. Polvani. 2020. "The effect of interactive ozone chemistry on weak and strong stratospheric polar vortex events." *Atmos. Chem. Phys.* . doi: 10.5194/acp-20-10531-2020.
- J. Oehrlein, G. Chiodo, L. M. Polvani. 2019. "Separating and quantifying the distinct impacts of El Niño and stratospheric sudden warmings on North Atlantic and Eurasian wintertime climate variability." *Atmospheric Science Letters*, 20 (7), e923.
- G. Chiodo, J. Oehrlein, L. M. Polvani, J. C. Fyfe, A. K. Smith. 2019. "Insignificant influence of the 11-year solar cycle on the North Atlantic Oscillation." *Nature Geoscience*. doi: 10.1038/s41561-018-0293-3.
- N. Karst, J. Langowitz, J. Oehrlein, D. S. Troxell. 2017. "Radio k -Chromatic Number of Cycles for Large k ." *Discrete Mathematics, Algorithms, and Applications*, 9(3).
- N. Karst, J. Oehrlein, D. S. Troxell, J. Zhu. 2015. " $L(d,1)$ -labelings of the edge-path-replacement by factorization of graphs." *J. of Comb. Optimization*, 30 (1), p. 34-41.
- N. Karst, J. Oehrlein, D. S. Troxell, J. Zhu. 2015. "The minimum span of $L(2,1)$ -labelings of generalized flowers." *Discrete Applied Math.*, 181, p. 139-151.
- N. Karst, J. Oehrlein, D. S. Troxell, J. Zhu. 2014. "Labeling amalgamations of Cartesian products of complete graphs with a condition at distance two." *Discrete Applied Math.*, 178, p. 101-108.

awards/grants

Project NExT Fellow, 2021-22.

Columbia University Center for Teaching & Learning Teaching Assessment Fellowship, 2019-2021. (Quantitative and qualitative education assessment work.)

National Science Foundation Graduate Research Fellowship, 2016-2021.

- mentorship & K-12 teaching** Geosciences Education & Mentorship Support or Científico Latino mentor, 2020-22.
- Faculty, MathPath summer program, July 2022. Taught courses aimed at middle school students in mathematics of climate, dynamical systems, algorithms.
- Johanna Doyle, Bronx High School of Science, Fall 2019-Fall 2021. El Niño-Southern Oscillation and Northern Hemisphere final stratospheric warmings.
- MIT Splash and Spark, Columbia Splash, Wave Learning Festival, Rainstorm 2013-2021. Taught short middle and high school courses on mathematical modeling, atmospheric science, data literacy, graph theory, and ballet history.
- LaGuardia Community College Aerodynamics Research Group, Spring 2019-Summer 2021. Co-supervised Andre Dragatan, Jonathan Granada, Kara Timrick, Rajasree Das, Jamie Hobbs, Rabeca Mohammad, and Elvin Puchuela.
- Art of Problem Solving Grader/Teaching Assistant, 2012-2020. Assisted and graded for a variety of middle and high school mathematics, programming, and contest preparation courses.
- professional service** Discussion leader, MathFest 2022 Project NExT Session on Course Design and North-eastern regional meeting.
- Co-organizer, Joint Mathematics Meetings 2022 Project NExT Session on Establishing Interdisciplinary Collaborations in Teaching and Research.
- Collection endorsement and activity reviewer for POGIL Project (Process-Oriented Guided Inquiry Learning).
- Referee for Teaching & Learning Inquiry, Geophysical Research Letters, Journal of Climate, Journal of Geophysical Research: Atmospheres, MDPI Atmospheres, MDPI Atmosphere Remote Sensing, Climate Dynamics, Weather.
- Judge for Undergraduate Statistics Project Competition 2021-23, Regeneron International Science and Engineering Fair American Statistical Association special award 2022, COMAP Mathematical Contest in Modeling 2020-23, Association for Women in Mathematics essay contest 2018-23, SIMIODE Challenge Using Differential Equations Modeling 2022.
- selected talks** “Integrating Modeling Into a Functions Corequisite,” COMAP Session on Integrating Modeling into Established Courses, Joint Math Meetings, Boston, Jan. 2023.
- “Math in the Sky: From Winter Weather to Future Climate,” Olin College Research Seminar, Dec. 2022.

- “Alternative Grading Practices” panel, AMATYC Annual Meeting, Toronto, Nov. 2022.
- “Understanding the Atmosphere: From Winter Weather to Future Climate,” Olin College Alumni Speaker Series, Oct. 2022.
- “Your First Years as Faculty,” Preparing to Teach Statistics and Data Science workshop, co-presented with Ciaran Evans, Aug. 2022.
- “Math in the Sky: Studying the Stratospheric Polar Vortex,” Joint Hofstra Mathematics & Geology, Environment and Sustainability Seminar, Oct. 2021.
- “Mathematics Research-Like Experience in a Discrete Structures Course for Computer Science Students.” MAA Session on Inquiry-Based Learning and Teaching, Joint Math Meetings, Virtual, Jan. 2021.
- “Characterizing the Surface Impact of Sudden Stratospheric Warmings in the Context of Internal Variability,” Subseasonal to Seasonal Climate Prediction, Processes, and Services, American Geophysical Union Fall Meeting 2020, Dec. 2020.
- “Using Climate Models to Understand Stratosphere-Troposphere Interaction,” Talk Math With Your Friends Virtual Colloquium, Sept. 2020.
- “The Other Polar Vortex: Stratospheric Impacts on North Atlantic Winter,” SURF at DAWN REU Summer Lunch Talk, Aug. 2020.
- “Bootstrap-Based Identification of the Surface Impact of Sudden Stratospheric Warmings,” Contributed Session on Climate and Meteorological Statistics, Joint Statistical Meetings, Aug. 2020.
- “Maps, Bridges, Networks, and Art Galleries: Introducing Secondary Students to Graph Theory through Classic Problems.” MAA Session on Outreach, Teaching and Learning Advanced Mathematics, Joint Math Meetings, Denver, Jan. 2020.
- “Introducing Mathematical Modeling to High School Students through Population Dynamics.” MAA Session on Mathematics and the Life Sciences: Initiatives, Programs, Curricula, Joint Math Meetings, Baltimore, Jan. 2019.
- “Separating and quantifying the distinct impacts of El Niño and stratospheric sudden warmings on North Atlantic and Eurasian wintertime climate.” Role of the Stratosphere in Climate Variability, Change, and Prediction, AMS 20th Conference on Middle Atmosphere, Phoenix, Jan. 2019
- “First and Second-Order Models of Vertical Motion of Dry Air Parcels.” MAA Session on the Teaching and Learning of Undergraduate Ordinary Differential Equations, Joint Math Meetings, San Diego, Jan. 2018.