

Exponent®
Engineering & Scientific Consulting

Hazel Rivera Rosario, Ph.D.

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Professional Profile

Rivera Rosario, Ph.D., is a mechanical and aerospace engineering expert with experience in fluid dynamics, turbulence, optical diagnostics, and experimental design. She has experience developing complex testing setups for multidisciplinary applications and using high-speed imaging, image processing techniques, and data analysis.

Before joining Exponent, Dr. Rivera Rosario completed her Ph.D. in Aerospace Engineering at Cornell University. Her dissertation research focused on characterizing the effects of compressibility on turbulent jets, particularly using optical methods such as schlieren imaging to quantify changes in the density field. She also investigated the feasibility of specialized medical equipment for aerosol containment during surgical procedures, supported projects involving the visualization of droplet breakup mechanisms from a cough-generating device, and supported the development of an experimental setup for testing breathability and thermal performance of fabrics. Earlier in her career, she contributed to propulsion system performance and trajectory optimization projects for supersonic vehicles. Dr. Rivera Rosario also holds an M.S. in Aerospace Engineering from Cornell University and a B.S. in Mechanical Engineering from the University of Puerto Rico at Mayagüez.

Academic Credentials & Professional Honors

Ph.D., Aerospace Engineering, Cornell University, 2026

M.S., Aerospace Engineering, Cornell University, 2021

B.S., Mechanical Engineering, University of Puerto Rico, 2018

NY Space Grant Graduate Research Fellowship, NY NASA Space Grant Consortium, 2024

NY Space Grant Graduate Research Fellowship, NY NASA Space Grant Consortium, 2021

McMullen Fellowship, Cornell University, 2021

GEM Fellowship, The National GEM Consortium, 2019

Dean’s Excellence Fellowship, Cornell University, 2018

Dr. Andrés Calderón Colón Scholarship, University of Puerto Rico at Mayagüez, 2018

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Prior Experience

Postdoctoral Research Associate, Cornell University, Ithaca, NY, 2026

Graduate Research Assistant, Cornell University, Ithaca, NY, 2018-2026

GEM Fellow Intern, MIT Lincoln Laboratory, Lexington, MA, 2019

Graduate Intern, NASA Glenn Research Center, Cleveland, OH, 2018

Summer Undergraduate Researcher, University of Florida, Gainesville, FL, 2017

Undergraduate Intern, NASA Glenn Research Center, Cleveland, OH, 2016

Professional Affiliations

American Physical Society (APS)

Tau Beta Pi Engineering Honor Society

Languages

Spanish

Publications

Rivera-Rosario HT, Bewley GP. Density gradient spectra in compressible turbulence from schlieren images. Propagation Through and Characterization of Atmospheric and Oceanic Phenomena. Optica Publishing Group 2023; PM4F-5.

Lee M, Rivera-Rosario HT, Kim MH, Bewley GP, Wang J, Warhaft Z, Stylman B, Park AI, MacMahon A, Kacker A, Schwartz TH. Development and validation of a patient face-mounted, negative-pressure antechamber for reducing exposure of healthcare workers to aerosolized particles during endonasal surgery. Journal of Neurosurgery 2021; 135(6):1825–1832.

Rivera-Rosario HT, Powell JS. Installation torque tables for noncritical applications. NASA Technical Reports Server 2017; (NASA/TM-2017-219475).

Presentations

Rivera-Rosario HT, John JP, Donzis DA, Bewley GP. Variation of density gradient statistics with Mach number in compressible turbulence. 77th Annual Meeting of the APS Division of Fluid Dynamics, Salt Lake City, UT, 2024.

Rivera-Rosario HT, John JP, Donzis DA, Bewley GP. Compressible turbulence density gradient spectra using schlieren imaging. 76th Annual Meeting of the APS Division of Fluid Dynamics, Washington, DC, 2023.

Rivera-Rosario HT, Bewley GP. Density Gradient Spectra in Compressible Turbulence from Schlieren Images. Optica Imaging Congress (pcAOP), Boston, MA, 2023.

Rivera-Rosario HT, Manzano-Miura N, Shikha S, Bewley GP. Statistics of density gradients in compressible turbulence using quantitative schlieren imaging. 75th Annual Meeting of the APS Division of Fluid Dynamics, Indianapolis, IN, 2022.

Rivera-Rosario HT, Manzano-Miura N, Bewley GP. Quantifying density fluctuations in compressible turbulence. 74th Annual Meeting of the APS Division of Fluid Dynamics, Phoenix, AZ, 2021.

Rivera-Rosario HT, Lee M, Kim MH, Bewley GP, Wang J, Warhaft Z, Stylman B, Park AI, MacMahon A, Kacker A, Schwartz TH. Flow disturbances reduce the effectiveness of a face-mounted negative pressure antechamber for endonasal surgery. 73rd Annual Meeting of the APS Division of Fluid Dynamics, 2020.

Rivera-Rosario HT, Manzano-Miura N, Bewley, GP. Visualization of shocklets in compressible turbulence using shadowgraphy. Poster presentation, GEM Annual Board Meeting and Conference, Chicago, IL, 2019.