Exponent®
Engineering & Scientific Consulting

Naoki Manzano Miura, Ph.D., P.E., CFEI

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Professional Profile

Dr. Manzano Miura specializes in fluid mechanics, thermodynamics, heat and mass transfer, statistical analysis, and experimental design. He applies his expertise in areas that include origin and cause investigations of fires and explosions, analysis of thermal or flow-driven failures, and laboratory testing of mechanical and hydraulic systems. Additionally, he has experience performing inspections to quantify contamination from wildland fires. Dr. Manzano Miura also has conducted third-party investigations to analyze relevant codes and standards as well as state and federal regulations for the assessment of large-scale industrial fires and near-miss incidents.

Prior to joining Exponent, Dr. Manzano Miura was a graduate student researcher in the Mechanical and Aerospace Engineering department at Cornell University. He performed experiments in high-speed turbulent compressible shear layers generated within a specialized pressure vessel that quantifies the effects of widely variable densities, viscosities and speeds of sound on fluid mechanics and turbulence. He used hot-wire anemometry principles to study the dynamics of turbulent fluctuations in compressible environments for a vast range of physical scales. He wrote data acquisition codes and data processing codes to improve the experimental setup and to interpret complex high-frequency data. His research on compressible turbulence has applications many natural and engineered settings, including high-speed aircraft and scramjets, astrophysical flows, and inertial confinement fusion. Dr. Manzano Miura acquired significant experience with instrumentation and techniques for fluid velocity measurement and with the development and fabrication of nanoscale turbulence sensors using semiconductor manufacturing techniques in a cleanroom. Additionally, he has led multiple wind tunnel projects, performed field experiments to study animal flight, and implemented modern manufacturing methods for centrifugal compressors. He also has experience with using high-speed imaging and developing particle tracking algorithms to quantify swirling flows in oil pipes, and with working with engineering teams to design condensate tanks, pressure vessels, and heat exchangers.

Academic Credentials & Professional Honors

Ph.D., Aerospace Engineering, Cornell University, 2022

M.S., Aerospace Engineering, Cornell University, 2020

B.S., Mechanical Engineering, Lehigh University, 2016

McMullen Fellowship, 2021

Cornelius Prize, 2016

Tau Beta Pi Engineering Honor Society, 2015

Licenses and Certifications

Professional Engineer Mechanical, California, #41940

40-Hour Hazardous Waste Operation and Emergency Response Certification (HAZWOPER) (CA)

Certified Fire and Explosion Investigator (CFEI) (CA)

Certified Forklift Operator (CFO) (CA)

Fire Investigation 1A (Cause and Origin), California Office of State Fire Marshal (CA)

Professional Affiliations

American Society of Mechanical Engineers (ASME)

National Fire Protection Association (member)

Languages

Catalan

French (France)

Japanese

Spanish

Publications

Manzano-Miura, N., Gloutak, D., Bewley G.P. Characterization of a turbulent flow with independent variation of Mach and Reynolds numbers, Experiments in Fluids 63:44 (2022)

Manzano-Miura, N., Signatures of compressibility in an annular free-shear layer with increasing Mach number, PhD Thesis (2022)

Presentations

Rivera-Rosario, H., Manzano-Miura, N., Shikha, S., & Bewley, G. Statistics of density gradients in compressible turbulence using quantitative schlieren imaging, Bulletin of the American Physical Society (2022).

Bewley G.P., Manzano-Miura, N., Rivera-Rosario, H., Dai, S., Measurement of the Scaling Exponents for Compressible Turbulence, 19th U.S. National Congress on Theoretical and Applied Mechanics (2022)

Manzano-Miura, N., Rivera-Rosario, H., Panickacheril John, J., Donzis, D.A., Bewley G.P. Signatures of compressibility of an annular free-shear layer with increasing Mach number, APS Division of Fluid Dynamics Meeting Abstracts, F19. 005 (2021)

Rivera-Rosario, H., Manzano-Miura, N., Bewley G.P. Quantifying density fluctuations in compressible turbulence, Bulletin of the American Physical Society 66 (2021)

Manzano-Miura, N., Bewley G.P. Extreme events in compressible turbulence, APS Division of Fluid Dynamics Meeting Abstracts, P15. 005 (2020)

Manzano-Miura, N., Gloutak, D., Atiq, Y., Chan, W., Depue, S., Bewley G.P. Spectra in compressible turbulence, APS Division of Fluid Dynamics Meeting Abstracts, S18. 003 (2019)

Manzano-Miura, N., Gloutak, D., Chan, W., Bewley, G.P. Experimental Characterization of Inertial Range Statistics in Compressible Turbulence, Bulletin of the American Physical Society 63 (2018)