



Exponent[®]
Engineering & Scientific Consulting

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

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Professional Profile

Dr. Manzano specializes in technical consulting and forensic engineering analysis of thermal-fluid systems. He leverages his background in fluid mechanics and heat transfer to support investigations of fires, explosions, and mechanical and plumbing system failures through inspections, laboratory testing, and root-cause analyses. His work includes aircraft and spacecraft component damage assessment, standards compliance, and accident investigations. He also performs atmospheric dispersion modeling to quantify airborne emissions for regulatory review, emergency response, and litigation support.

At Exponent, Dr. Manzano supports product liability and property damage matters by designing and building test rigs to evaluate consumer products for conformance with relevant industry standards. He also conducts field inspections for insurance claims involving wildfire contamination (ash, char, and soot). In addition to testing and field work, Dr. Manzano routinely applies air dispersion modeling (AERMOD, CALPUFF) and computational fluid dynamics (STAR-CCM+) to quantify pollutant transport and support analyses of flow-driven failure mechanisms.

Prior to joining Exponent, Dr. Manzano was a graduate researcher at Cornell University, where he completed his Ph.D. in Aerospace Engineering. His doctoral research focused on characterizing turbulent fluctuations in compressible jet flows using hot-wire anemometry, with applications to high-speed flight and propulsion systems. During his time at Cornell, Dr. Manzano developed custom data acquisition and processing codes, and led wind-tunnel projects to quantify the downstream development of turbulence. He also applied cleanroom techniques to fabricate microscale flow sensors. Before his doctoral work, Dr. Manzano designed experimental setups to study animal flight and used high-speed imaging and particle-tracking algorithms to quantify complex internal flows. He also collaborated with interdisciplinary engineering teams on the design of centrifugal compressors, 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 Forklift Operator (CFO) (CA)

Certified Fire and Explosion Investigator (CFEI) (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

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

Manzano-Miura, N., Rundel, J., Jaimes, D., Welchert, N., Christiansen, E. Investigating the Ignition Propensity of Forest Fuels by Molten Copper and Aluminum Droplets, *International Association of Wildland Fire* (2024)

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)