



Exponent[®]
Engineering & Scientific Consulting

Dom Casalnuovo, Ph.D.

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Professional Profile

Dr. Casalnuovo is a chemical engineer in Exponent's Thermal Sciences Practice specializing in the sampling and analysis of gases and aerosol particles. He has expertise in measurement of atmospheric pollutants, gas-phase kinetics, development of analytical techniques, and design of gas-phase flow reactors. Dr. Casalnuovo's experience with building experimental systems and his background in mass transfer, kinetics, and thermodynamics enable him to analyze and explain complex engineering problems.

Dr. Casalnuovo earned his Ph.D. in Chemical Engineering from Carnegie Mellon University, where his research focused on the measurement, transport, and kinetics of trace atmospheric gases and aerosol particles affecting global radiative forcing. As part of his doctoral work, he planned and executed field measurement campaigns in rural and urban environments, integrating real-world measurements with Gaussian plume and trajectory models to investigate pollutant sources, chemical transformations, and fates.

He has experience operating analytical instruments such as chemical ionization mass spectrometers (CIMS), condensation particle counters (CPC), scanning mobility particle sizers (SMPS), aerosol particle sizers (APS), trace gas monitors, X-ray photoelectron spectrometers (XPS), and X-ray fluorescence (XRF) spectrometers. He has also developed instrumentation techniques for detecting trace concentrations of reactive gases in remote environments.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, Carnegie Mellon University, 2025

B.S., Chemical Engineering, Tulane University, 2020

NSF Graduate Research Fellow, 2021

H. Robert Sharbaugh Presidential Fellowship in Chemical Engineering, 2020

Tau Beta Pi Engineering Honor Society

Prior Experience

Graduate Research Assistant, Carnegie Mellon University, 2020-2025

Surface Analysis Research and Development Intern, Sandia National Laboratories, 2018-2020

Professional Affiliations

American Association for Aerosol Research

American Institute of Chemical Engineers

Publications

Casalnuovo DA, Cheng D, Flores MR, Castellanos AM, Jen CN. A reactive condensation particle counter for measuring atmospherically relevant concentrations of sulfuric acid. *Aerosol Science and Technology* 2025; 59(7):794-805.

Fomete SKW, Johnson JS, Casalnuovo D, Jen CN. A tutorial guide on new particle formation experiments using a laminar flow reactor. *Journal of Aerosol Science* 2021; 157.

Flanagan TM, Brumbach MT, Chow R, Casalnuovo D, Rubio-Zuazo J, Castro G. Molybdenum and silver photoemission survey spectra from hard x-rays. *Surface Science Spectra Journal* 2021; 28(1).

Flanagan TM, Brumbach MT, Chow R, Casalnuovo D, Rubio-Zuazo J, Castro G. Gold photoemission survey spectra from hard x-rays. *Surface Science Spectra Journal* 2020; 27(1).

Presentations

Casalnuovo DA, Cheng D, Troller C, Jen CN. Investigating nocturnal formation of sulfuric acid vapor in Pittsburgh, PA. Conference presentation, 42nd Annual American Association for Aerosol Research Conference, Albuquerque, NM, 2024.

Casalnuovo DA, Cheng, D, Troller C, Jen CN. Investigating temporal trends of sulfuric acid nanoclusters in Pittsburgh, PA during the Spring and Fall. Symposium presentation, 46th Annual Chemical Engineering Graduate Student Association Symposium, Pittsburgh, PA, 2024.

Casalnuovo DA, Cheng D, Jen CN. Evaluation of a condensation particle counter method for measuring sulfuric acid vapor concentrations. Conference presentation, 40th Annual American Association for Aerosol Research Conference, Raleigh, NC, 2022.