



RAL SEMINAR SERIES

Simulating Cloud-Aerosol-Turbulence Interactions in the Laboratory: Large-Eddy Simulations, Direct Numerical Simulations, and Machine Learning

AARON WANG

Earth Scientist
Pacific Northwest National Laboratory



Wednesday, July 16, 2025 1-2 PM (MT)

HYBRID MEETING FL2-1022 | [Watch Live](#)

Cloud–aerosol–turbulence interactions have been studied in the laboratory using convection cloud chambers, such as the Pi Chamber at Michigan Tech University, which generates a turbulent cloud through mixing driven by a moist, warm bottom and a moist, cold top. However, the Pi Chamber is too small to explore the influence of turbulence on droplet collision–coalescence, a key step in the transition from cloud to drizzle. As a result, the Large-Scale Aerosol–Cloud–Drizzle–Convection Chamber (ACDC2) project has been underway since 2021 to conceptualize a new cloud chamber for studying collision–coalescence. To design such a chamber, numerical simulations allow us to reproduce, interpret, and extend the experiments conducted in the cloud chamber. In this talk, I will introduce how these approaches are used to improve our understanding of the Pi Chamber experiments, how they are utilized in designing a new chamber, and the challenges associated with these approaches. Ongoing work to continue the ACDC2 project will also be introduced. [Event website.](#)