

**ATS/CIRA Colloquium**

**Po-Lun Ma**

**from Pacific Northwest National Laboratory**

**Hosted by Christine Chiu**

**3 p.m. Thursday, Sept. 29**

**ATS 101 and Microsoft Teams**

**Toward credible predictions of aerosol-cloud interactions in Earth system models**

The role of aerosol-cloud interactions (ACI) in the climate system is a major source of uncertainty in projections of Earth's future climate and in interpreting how the climate has evolved in the past. Over the last decade, efforts have been made to improve understanding and to address deficiencies in Earth system models (ESMs), including increasing model resolution, improving the representation of aerosol and cloud properties and processes, and incorporating observational constraints. In this talk, I will introduce a major effort, the "Enabling Aerosol-cloud interactions at GLobal convection-permitting scales (EAGLES)" project, which seeks to improve the U.S. Department of Energy's Energy Exascale Earth System Model (E3SM). I will also discuss our efforts in deploying artificial intelligence (AI) and machine learning (ML) techniques to replace or augment parameterizations, providing better or faster simulations of droplet nucleation, warm rain initiation, and aerosol optics.

Colloquia page: [atmos.colostate.edu/colloquia](https://atmos.colostate.edu/colloquia)