# Zhuocan Xu

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#### **EDUCATION**

- Ph.D.Atmospheric SciencesUniversity of UtahDissertation: "Assessment of Cloud and Precipitation Properties from Synergistic<br/>Remote Sensing Observations with a Focus on Aerosol Interactions"<br/>Advisor: Dr. Gerald "Jay" Mace
- M.S. Atmospheric Sciences University of Utah

B.S. Atmospheric Sciences Nanjing University of Information Science & Technology

#### **PEER-REVIEWED PUBLICATIONS**

**Xu, Z.**, G. G. Mace, S. Tanelli, O. Sy, C. Amiot and T. Lang, A. Sokolowsky and S. ven den Heever, 2023: The Effect of Aerosol Loading on Shallow Convective Precipitation Inferred from Co-occurring Cloud and Precipitation within the Warm-topped Maritime Clouds Observed during CAMP<sup>2</sup>Ex. *To be submitted*.

Reid, J., and coauthors, 2022: The Coupling between Tropical Meteorology, Aerosol Lifecycle, Convection, and Radiation during the Clouds, Aerosol and Monsoon Processes Philippines Experiment (CAMP<sup>2</sup>Ex). *Bull. Amer. Meteo. Soc.*, in press.

Xu, Z., G. G. Mace and D. J. Posselt, 2022: Impact of Rain on Retrieved Warm Cloud Properties Using Visible and Near-infrared Reflectances Using Markov Chain Monte Carlo Techniques. *IEEE Trans. Geosci. Remote Sens.*, **60**, 1-10, 2022, DOI: 10.1109/TGRS.2022.3208007.

Xu, Z., G. G. Mace and D. J. Posselt, 2019: A Method for Assessing Relative Skill in Retrieving Cloud and Precipitation Properties in Next Generation Coud Radar and Radiometer Orbiting Observatories. *J. Atmos. Oceanic Technol.*, **36**, 2283–2306, DOI: 10.1175/JTECH-D-18-0204.1.

Mascio, J., Z. Xu, and G. G. Mace, 2017: The Mass-Dimensional Properties of Cirrus Clouds during TC4. *J. Geophys. Res. Atmos.*, **122**, 10 402–10 417, DOI: 10.1002/2017JD026787.

**Xu, Z**. and G.G. Mace, 2017: Ice Particle Mass–Dimensional Relationship Retrieval and Uncertainty Evaluation Using the Optimal Estimation Methodology Applied to the MACPEX Data. *J. Appl. Meteor. Climatol.*, **56**, 767–788, DOI: 10.1175/JAMC-D-16-0222.1.

## **TECHNICAL SKILLS**

Programming:	FORTRAN, IDL, Python, shell scripts, MATLAB and HTML
Radiative transfer models:	The Colorado State University Radiant model and DIScrete Ordinate Radiative Transfer (DISORT)
Statistical techniques:	Bayesian Optimal Estimation, Markov Chain Monte Carlo algorithms, uncertainty quantification and information content analysis

#### FIELD EXPERIENCE

Cloud • P E • F • P	d, Aerosol and Monsoon Processes Philippines Experiment (CAMP2Ex) Performed the cloud and precipitation microphysics retrievals using Optimal Estimation methods on site Flied on the SPEC Lear Jet and took flight notes Participated in flight planning	2019
Onta • D • F	rio Winter Lake-effect System (OWLeS) De-rimed instruments and took photos of snowflakes Flied on the Wyoming King-Air research aircraft and took flight notes	2014
Integ • P	<b>Prated Precipitation and Hydrology Experiment (IPHEX)</b> Preliminary analysis on the particle size distribution data	2014

# **SELECTED AWARDS**

American Meteorological Society (AMS) the 16 <sup>th</sup> Conference on Cloud Physics Honorable Mention Award in the Poster Presentations Category	
American Geophysical Union (AGU) Fall Meeting Outstanding Student Presentation Award	2021
Graduate Student Travel Assistance Award	2021

## SELECTED CONFERENCE PRESENTATIONS

**Xu, Z.**, G. G. Mace, C. Amiot, S. Tanelli, T. Lang, O. Sy, G. A. Sokolowsky, and S. van den Heever (2022): Investigating the Aerosol Effects on Cloud and Precipitation Microphysical and Macrophysical Properties within Shallow Maritime Clouds during CAMP<sup>2</sup>Ex, AMS Collective Madison Meeting, Madison, WI, Aug. 8-13, (*poster*)

Xu, Z., G. G. Mace, C. Amiot, S. Tanelli and T. Lang (2021): The Effect of Aerosol Loading on Shallow Convective Precipitation Inferred from Co-occurring Cloud and Precipitation within the Warm-topped Maritime Clouds Observed during CAMP<sup>2</sup>Ex, AGU Fall Meeting, New Orleans, LA, Dec. 13-17, (*poster*)

**Xu, Z.**, G. G. Mace, S. Tanelli, O. Sy, T. Lang, C. Amiot, A. Sokolowsky and S. ven den Heever (2021): Cloud Line Evolution from P-3 Repeat Tracks, CAMP<sup>2</sup>EX Cloud Breakout session, Nov. 3, (*talk*)

**Xu, Z.**, G. Mace and D. J. Posselt (2019), Impact of Precipitation on Retrieved Warm Cloud Properties Using Visible and Near-infrared Reflectances Using Markov Chain Monte Carlo Techniques, AGU Fall Meeting, San Francisco, CA, Dec. 9-13, (*poster*)

**Xu, Z.**, G. Mace and D. J. Posselt (2019), Using Markov Chain Monte Carlo Methodology to Retrieve Co-occurring Cloud and Precipitation Microphysics with ORACLES data, CAMP2Ex Science Team Meeting, Pasadena, CA, Mar. 5-7, (*talk*)

**Xu, Z.**, G. Mace and D. J. Posselt (2018), Characterizing the Trade Space Between Capability and Complexity in Next Generation Cloud and Precipitation Observing Systems Using Markov Chain Monte Carlos Techniques, AMS annual meeting, Austin, TX, Jan 7-11, (*poster*)

**Xu, Z.**, G. Mace, L. Avalone and Z. Wang (2015), Ice particle mass-dimensional parameters retrieval and uncertainty analysis using Optimal Estimation, Workshop on 'Microphysics of ice clouds', Vienna, Austria, Apr. 11-12, (*talk*)

**Xu, Z.**, G. Mace, D. Turner and D. Posselt (2014), How Various Sources of Uncertainty Affect Retrieval Uncertainty in the Optimal Estimation Framework Using a Non-precipitating Liquid Clouds Example, AGU Fall Meeting, San Francisco, CA, Dec. 15-19, (*talk*)

#### WORKSHOPS

Observations of Clouds & Precipitation Using "Distributed Instruments" California Institute of Technology, Pasadena, CA	
Vienna University of Technology Vienna Austria	2015