Mariko Oue (a.k.a. Mariko Endo)
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(a) Education

Ph.D.	Science	Nagoya University, Nagoya, Japan	April 2008 - September 2010
M.S.	Science	Nagoya University, Nagoya, Japan	April 2006 - March 2008
B.S.	Arts and Sciences	Osaka Kyoiku University, Kashiwara, Japan	April 2002 - March 2006

(b) Appointments

2021 – Research Assistant Professor Stony Brook University, Stony Brook, NY

- Study of dynamics and microphysics of ice precipitation clouds using multi-frequency, scanning cloud radars and lidars.
- Study of cloud properties of convective clouds using cloud radar and lidar observations, numerical model and a radar forward simulator.

2019 – 2021 Stony Brook University, Stony Brook, NY

- Study of dynamics and microphysics of ice precipitation clouds using multi-frequency, scanning cloud radars and lidars.
- Managing the Stony Brook Radar Observatory instruments and datasets

(c) Postdoctoral research experience

2016 – 2019 Postdoctoral Fellow Stony Brook University, Stony Brook, NY

- Study of dynamics and microphysics of ice precipitation clouds using multi-frequency, scanning cloud radars and lidars.
- Study of cloud properties of shallow convection using numerical model and a radar forward simulator.

2012 – 2015 Postdoctoral Fellow The Pennsylvania State University, University Park, PA

- Study of dynamics and microphysics of Arctic precipitation clouds using scanning precipitation radar, cloud radar, lidar, and numerical model.
- Numerical simulations of Arctic clouds using the WRF model.
- Field campaign: North Slope of Alaska Scanning Radar IOP.

2010 – 2012 Postdoctoral Fellow Nagoya University, Nagoya, Japan

- Study of dynamics and microphysics of mesoscale convective clouds in midlatitude and subtropics using polarimetric radar and in-situ measurements.
- Numerical simulations of mesoscale convective systems using a cloud resolving model.
- Participated and organized field observations.

(d) Research Interest

My Interest is in dynamics and microphysics of snowstorms, shallow cumulus, and deep convective clouds, including ice and rain precipitation particle formation processes. and impacts of turbulence on the particle formation processes. Main objectives are to understand growth processes of ice crystal habits and types and their relationships with vertical velocity and other cloud properties. I analyze radar Doppler spectra and polarimetric variables from remote sensing measurements such as cloud and precipitation radars, lidar, and microwave radiometers. I have developed a radar forward simulator and use it to investigate uncertainties in the radar and lidar observations and to evaluate/improve cloud resolving model simulations.

(e) Awards

- PI of DOE/ASR Award: Examining the Impacts of Microphysical-Dynamical Feedbacks on Convective Clouds in Different Aerosol Environments Using Enhanced Observational and

Modeling Strategies (Collaboration with Susan van den Heever of Colorado State University)
Duration 9/15/20-9/14/23, Total award amount for all years $212,272.00

- PI of DOE Award: Coupled Observational-Modeling Studies of Land-Aerosol-Cloud Interactions in the Southeastern US
  Duration 4/1/20-1/31/25, Total award amount for all years $ 141,018.00

- Co-I of NSF Collaborative Research: Experiment of Sea Breeze Convection, Aerosols, Precipitation and Environment (ESCAPE), PI: Pavlos Kollias
  Duration 1/1/21-12/31/22, Total award amount for all years $ 1,323,126

- Co-I of NSF Collaborative Research: Extensive Field Observations and Modeling to Understand Multi-band Precipitation Processes within Winter Storms, PI: Brian Colle
  Duration 5/1/19-4/30/22, Total award amount for all years $ 455,871.00

- Co-I of NSF CIF: Millimeter-wavelength Radar Facility for Cloud and Precipitation Research, PI: Pavlos Kollias
  Duration 2021-2024

- Co-I of NSF Mid-scale R1: Design for a Large Convection Cloud Chamber for Cloud-Aerosol-Turbulence Interactions, PI: Pavlos Kollias
  Duration 2021-2023

(f) Synergistic Activities

2021-2022: Associate Editor of the Journal of the Atmospheric Sciences
2019: Organizer of a workshop on Cloud Resolving Radar Simulator (CR-SIM) held in Leipzig Institute for Meteorology
2019: Lecturer at the 2019 JOYCE Summer School
2018: Lecturer at the 2018 ARM Summer Training and Science Applications Event
2018: Member of a review panel of DOE ASR
2012: Lead scientist of raindrop size distribution AMIE-Gan Ancillary Disdrometer observation in 2012

(g) Skills:

- Computer Languages: Fluent in C, Python, Matlab, Perl, Fortran, Shell, and HTML.
  Working experience on Linux, Mac and Windows systems.
- Graphical analysis tools for large datasets: e.g., Python, Matlab, GrADS, Generic Mapping Tools.
- Quality control and analysis of meteorological data: radar data, sounding data, numerical model data, and lidar data.
- Computer managements of mail server, web server, and firewall.
- Numerical simulations using cloud-resolving models.
- Ability to work both independently and collaboratively as a member of scientific teams.

(h) Publications

Carlin, J. T., Dunnavan, E. L., Ryzhkov, A. V., and **Oue, M**. (2023). Impacts of Vertical Nonuniform Beam Filling on the Observability of Secondary Ice Production due to Sublimation, Journal of Atmospheric and Oceanic Technology, 40(1), 65-84.

Oue, M., Saleeby, S. M., Marinescu, P. J., Kollias, P., and van den Heever, S. C. (2022): Optimizing Radar Scan Strategies for Observing Deep Convection Using Observing System Simulation Experiments, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2022-346.

Skow, A., Poellot, M., Delene, D., Askelson, M., North, K., and **Oue, M**. (2022). A Multi-Platform In Situ Kinematic and Microphysical Analysis of a Hybrid Parallel–Trailing Stratiform Mesoscale Convective System, Monthly Weather Review, 150(4), 927-948.

Kollias, P., Palmer, R., Bodine, D., Adachi, T., Bluestein, H., Cho, J. Y. N., Griffin, C., Houser, J., Kirstetter, P. E., Kumjian, M. R., Kurdzo, J. M., Lee, W. C., Luke, E. P., Nesbitt, S., **Oue, M**., Shapiro, A., Rowe, A., Salazar, J., Tanamachi, R., Tuftedal, K. S., Wang, X., Zrnic, D., and Puigdomenech Treserras, B. (2022). Science Applications of Phased Array Radars. Bulletin of the American Meteorological Society, 103(10), E2370-E2390. doi: https://doi.org/10.1175/BAMS-D-21-0173.1.

Oue, M., Kollias, P., Matrosov, S. Y., Battaglia, A., and Ryzhkov, A. V., 2021: Analysis of the microphysical properties of snowfall using scanning polarimetric and vertically pointing multi-frequency Doppler radars, Atmos. Meas. Tech., 14, 4893–4913, https://doi.org/10.5194/amt-14-4893-2021.

Lamer, K., **M. Oue**, A. Battaglia, R. J. Roy, K. B. Cooper, R. Dhillon, and P. Kollias, 2021: Multifrequency radar observations of clouds and precipitation including the G-band, Atmos. Meas. Tech., 14, 3615–3629, https://doi.org/10.5194/amt-14-3615-2021.

Kumjian, M. R., D. M. Tobin, **M. Oue**, and P. Kollias, Microphysical Insights into Ice Pellet Formation Revealed by Fully Polarimetric Ka-band Doppler Radar. J. Appl. Meteor. Climatol., doi: https://doi.org/10.1175/JAMC-D-20-0054.1

Kollias, P., E. Luke, **M. Oue**, and K. Lamer, 2020: Agile adaptive radar sampling of fast-evolving atmospheric phenomena guided by satellite imagery and surface cameras. Geophysical Research Letters, 45, e2020GL088440. https://doi.org/10.1029/2020GL088440

Oue, M., A. Tatarevic, P. Kollias, D. Wang, K. Yu, and A. M. Vogelmann, 2020: The Cloud-resolving model Radar SIMulator (CR-SIM) Version 3.3: description and applications of a virtual observatory, Geosci. Model Dev., 13, 1975–1998, https://doi.org/10.5194/gmd-13-1975-2020.

Kollias, P., N. Bharadwaj, E.E. Clothiaux, K. Lamer, **M. Oue**, J. Hardin, B. Isom, I. Lindenmaier, A. Matthews, E.P. Luke, S.E. Giangrande, K. Johnson, S. Collis, J. Comstock, and J.H. Mather, 2020: The ARM Radar Network: At the Leading Edge of Cloud and Precipitation Observations. Bull. Amer. Meteor. Soc., 101, E588–E607, https://doi.org/10.1175/BAMS-D-18-0288.1.

Borque, P., S.W. Nesbitt, R.J. Trapp, S. Lasher-Trapp, and **M. Oue**, 2020: Observational Study of the Thermodynamics and Morphological Characteristics of a Midlatitude Continental Cold Pool Event. Mon. Wea. Rev., 148, 719–737, https://doi.org/10.1175/MWR-D-19-0068.1.

Chen, Y.-S., J. Y. Harrington, J. Verlinde, F. Zhang, **M. Oue**, 2020: Dynamical response of an Arctic mixed‐phase cloud to ice precipitation and downwelling longwave radiation from an upper‐level cloud. Journal of Geophysical Research: Atmospheres, 125, e2019JD031089. https://doi.org/10.1029/2019JD031089.

Endo, S., D. Zhang, A. M. Vogelmann, P. Kollias, K. Lamer, **M. Oue**, H. Xiao W. I. Gustafson Jr., and D. M. Romps, 2019: Reconciling differences between large-eddy simulations and Doppler-lidar observations of continental shallow cumulus cloud-base vertical velocity. Geophysical Research Letters, 46. https://doi.org/10.1029/2019GL084893

Oue, M., P. Kollias, A. Shapiro, A. Tatarevic, and T. Matsui, 2019: Investigation of observational error sources in multi-Doppler-radar three-dimensional variational vertical air motion retrievals. Atmos. Meas. Tech., 1999-2018, https://doi.org/10.5194/amt-12-1999-2019.

Ghate, V.P., P. Kollias, S. Crewell, A.M. Fridlind, T. Heus, U. Löehnert, M. Maahn, G.M. McFarquhar, D. Moisseev, **M. Oue**, M. Wendisch, and C. Williams, 2019: The Second ARM Training and Science Application Event: Training the Next Generation of Atmospheric Scientists. Bull. Amer. Meteor. Soc., 100, ES5–ES9, https://doi.org/10.1175/BAMS-D-18-0242.1

Kollias, P., D. J. McLaughlin, S. Frasier, **M. Oue**, E. Luke and A. Sneddon, "Advances and applications in low-power phased array X-band weather radars," 2018 IEEE Radar Conference (RadarConf18), Oklahoma City, OK, 2018, pp. 1359-1364, doi: 10.1109/RADAR.2018.8378762.

Oue, M., P. Kollias, A. Ryzhkov, and E. Luke, 2018: Toward exploring the synergy between cloud radar polarimetry and Doppler spectral analysis in deep cold precipitating systems in the Arctic. *J. Geophys. Res*. vol. 123, 2797 – 2815, doi: 10.1002/2017JD027717.

North, K. W., **M. Oue**, P. Kollias, S. E. Giangrande, S. M. Collis, and C. K. Potvin, 2017: Vertical air motion retrievals in deep convective clouds using the ARM scanning radar network in Oklahoma during MC3E. *Atmospheric Measurement Techniques*, vol. 10, 2785-2806, doi: 10.5194/amt-10-2785-2017.

Oue, M., P. Kollias, K. W. North, A. Tatarevic, S. Endo, A. M. Vogelmann, and W. I. Gustafson Jr., 2016: Estimation of cloud fraction profile in shallow convection using a scanning cloud radar. *Geophys. Res. Letters*, 43,10998–11006, doi: 10.1002/2016GL070776.

Jiang, Z., **M. Oue**, J. Verlinde, E. E. Clothiaux, K. Aydin, and G. Botta, 2016: What do we know about aspect ratios of aggregates? *J. Appl. Meteor. Climatol*., vol. 56, 725-734, doi: 10.1175/JAMC-D-16-0248.1.

Kalesse, H., G. de Boer, A. Solomon, **M. Oue**, M. Ahlgrimm, D. Zhang, M. Shupe, E. Luke, and A. Protat, 2016: Understanding rapid changes in phase partitioning between cloud liquid and ice in stratiform mixed-phase clouds: An Arctic Case Study. *Mon. Wea. Rev.,* 144, 4805-4826, doi: 10.1175/MWR-D-16-0155.1.

Wen, G., **M. Oue**, A. Protat, J. Verlinde, and H. Xia, 2016: Ice particle type identification for shallow Arctic mixed-phase clouds using X-band polarimetric radar. *Atmos. Res*., vol. 182, 114-131, doi: 10.1016/j.atmosres.2016.07.015.

Ohigashi, T, K. Tsuboki, and **M. Oue**, 2016: Cloud-top supercooled liquid droplets in stratiform clouds observed during winter in inland Hokkaido, Japan. *SOLA*, vol. 12, 140−145, doi:10.2151/sola.2016-030.

Oue, M., M. Galletti, J. Verlinde, A. Ryzhkov, and Y. Lu, 2016: Use of X-band differential reflectivity measurements to study shallow Arctic mixed-phase clouds. J. Appl. Meteor. Climatol., vol. 55, 403-424, doi: 10.1175/JAMC-D-15-0168.1.

Kouketsu, T., H. Uyeda, T. Ohigashi, **M. Oue**, H. Takeuchi, T. Shonoda, K. Tsuboki, M. Kubo, and K. Muramoto, 2015: A hydrometeor classification method for X-band polarimetric radar: Construction and validation focusing on solid hydrometeors under moist environment. *J. Atmos. Ocean. Technol*., vol. 32, 2052-2074, doi: 10.1175/JTECH-D-14-00124.1.

Oue, M., T. Ohigashi, K. Tsuboki, and E. Nakakita, 2015: Vertical distribution of precipitation particles in Baiu frontal stratiform intense rainfall around Okinawa Island, Japan. *J. Geophys. Res.*, vol. 120, 5622–5637, doi: 10.1002/2014JD022712.

Oue, M., M. R. Kumjian, Y. Lu, J. Verlinde, K. Aydin, and E. E. Clothiaux, 2015: Linear depolarization ratios of columnar ice crystals in a deep precipitating system over the Arctic observed by zenith-pointing Ka-band Doppler radar. *J. Appl. Meteor. Climatol.,* vol. 54, 1060-1068, doi: 10.1175/JAMC-D-15-0012.1.

Oue, M., M. R. Kumjian, Y. Lu, Z. Jiang, E. E. Clothiaux, J. Verlinde, and K. Aydin, 2015: X-band polarimetric and Ka-band Doppler spectral radar observations of a graupel-producing Arctic mixed-phase cloud. *J. Appl. Meteor. Climatol*., vol. 54, 1335-1351, doi: 10.1175/JAMC-D-14-0315.1.

Oue, M., K. Inagaki, T. Shinoda, T. Ohigashi, T. Kouketsu, M. Kato, K. Tsuboki, and H. Uyeda, 2014: Polarimetric Doppler radar analysis of orientation of a stationary rainband with changing orientations in July 2010. *J. Meteor. Soc. Japan*, vol. 92, 457–481, doi: 10.2151/jmsj.2014-503.

Oue, M., H. Uyeda and D.-I. Lee, 2011: Raindrop size distribution parameters estimated from polarimetric radar variables in convective cells around Okinawa Island during the Baiu period. *Asia-Pacific J. of Atmos. Sci*., vol. 47(1), 33–44, doi:10.1007/s13143-011-1003-x.

Oue, M., H. Uyeda and Y. Shusse, 2010: Two types of precipitation particle distribution in convective cells accompanying a Baiu frontal rainband around Okinawa Island, Japan. *J. Geophys. Res.*, vol. 115, D02201, doi: 10.1029/2009JD011957.

(i) Products

Oue, M., A. Tatarevic, P. Kollias, D. Wang, and K.-M. Yu, "The Cloud Resolving Model Radar Simulator (CR-SIM) Version 3.3" (2019). SoMAS Research Data. 4.
https://commons.library.stonybrook.edu/somasdata/4

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