Curriculum Vitae

Man-Yau ("Joseph") Chan

Assistant Professor
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Earned Degrees

The Pennsylvania State University	Meteorology and Atmospheric Science	Ph.D. (2022)
National University of Singapore	Physics	B.Sc. (Hons; 2017)

Research Areas and Interests

Data Assimilation, Numerical Weather Prediction, Uncertainty Quantification and Propagation

Employment History

Jan 2024 – present	Assistant Professor	Atmospheric Science Program, Department of Geography, The Ohio State University
Jan 2023 – Dec 2023	Postdoctoral Fellow	Advanced Study Program (ASP), National Center for Atmospheric Research
Apr 2019 – Dec 2022	Graduate Research Assistant	Department of Meteorology and Atmospheric Science, The Pennsylvania State University
Jan 2019 – Apr 2019	Course Instructor	Department of Meteorology and Atmospheric Science, The Pennsylvania State University
Aug 2017 – Jan 2019	Graduate Research Assistant	Department of Meteorology and Atmospheric Science, The Pennsylvania State University

Teaching Experience (The Ohio State University) *[AU = Autumn, SP = Spring, Red = projected]*

ATMOSSC 5502	Physical Meteorology	SP26, SP27
ATMOSSC 5950	Atmospheric Thermodynamics	AU25, AU26
GEOG 8901	Problems in Climatology: Data Assimilation	SP26
ATMOSSC 4194	Group Studies: Physical Meteorology	SP25
ATMOSSC 4194	Group Studies: Practical Programming and Data Analysis for Atmospheric Science	AU24
ATMOSSC 2940	Basic Meteorology	SP24

Courses Created (The Ohio State University)

ATMOSSC 5401: Practical Data Processing and Analysis for Atmospheric Sciences
This course teaches data processing and analysis skills that are crucial for all careers in atmospheric science. As such, all federal meteorologist positions and professional certifications by the American Meteorological Society requires taking this course or equivalent experience. I spearheaded the creation of this course by writing the course syllabus and proposal, creating the first complete set of teaching materials for the course, and by teaching the first version of course in Fall 2024 as ATMOSSC 4194 Group Studies. ATMOSSC 5401 has been officially approved and is now a required course in OSU's BSc program in Atmospheric Science.

ATMOSSC 5502: Physical Meteorology
This course teaches the fundamentals of the cloud physics, radiation physics and atmospheric chemistry that are essential for understanding the atmosphere and numerical weather modelling. All federal meteorologist positions and professional certifications by the American Meteorological Society requires taking this course or equivalent experience. I spearheaded the creation of this course by writing the course syllabus and proposal, created multiple complete sets of teaching materials, and taught the first version of this course in Spring 2025 as ATMOSSC 4194 Group Studies. ATMOSSC 5502 has been officially approved, is now a required course in OSU's BSc program in Atmospheric Science, and will be taught by me for the foreseeable future.

Teaching Awards (The Ohio State University)

- Finalist in the 2025 College of Arts and Sciences' Outstanding Teaching Award.

Publications

ORCiD: https://orcid.org/0000-0001-5037-1991
Google Scholar: https://scholar.google.com/citations?user=n34AAP8AAAAJ&hl=en

Peer-Reviewed Journal Articles (Red: Student)

1. **Chan, M.-Y.**, Chipilski H. G., **Schwartz J.**, **Albrecht M.**, **Ridgway A.**, **Shuvo S. D.** (2026): The Multiscale Non-Gaussian Statistics of Free-Running 1000-Member General Circulation Model Ensembles. *Atmospheric Science Letters*. doi: 10.1002/asl2.70048.
2. **Chan, M.-Y.** (2026): Improving Infrared Radiance Ensemble Data Assimilation through Mitigating Deleterious Non-Gaussian Artifacts. *Quarterly Journal of the Royal Meteorological Society.* doi: 10.1002/qj.70039
3. **Chan, M.-Y.** (2024): Improving Ensemble Data Assimilation with Probit-space Ensemble Size Expansion for Gaussian Copulas (PESE-GC). *Nonlinear Processes in Geophysics.* doi: 10.5194/egusphere-2023-2699
4. **Chan, M.-Y.**, Chen X. and Anderson J. L. (2023): The potential benefits of handling clear and cloudy ensemble members separately through an efficient bi-Gaussian EnKF. *Journal of Advances in Modeling Earth Systems.* doi: 10.1029/2022MS003357
5. **Chan, M.-Y.**, Chen X. and Leung R. L. (2022): A high-resolution Tropical Mesoscale Convective System Reanalysis (TMeCSR). *Journal of Advances in Modeling Earth Systems.* doi: 10.1029/2021MS002948
6. Hartman, C. M., Chen X. and **Chan M.-Y.** (2022): Improving Tropical Cyclogenesis Forecasts of Hurricane Irma (2017) through the Assimilation of All-sky Infrared Brightness Temperatures. *Monthly Weather Review.* doi: 10.1175/MWR-D-22-0196.1.
7. **Chan, M.-Y.**, and Chen X. (2021): Improving the Analyses and Forecasts of a Tropical Squall Line Using Upper Tropospheric Infrared Satellite Observations. *Advances in Atmospheric Sciences*. doi: 10.1007/s00376-021-0449-8.
8. Zhang, Y., Sieron S. B., Lu Y., Chen X., Nystrom R. G., Minamide M., **Chan M.-Y.**, Hartman C. M., Yao Z., Ruppert J. H., Okazaki A., Greybush S. J., Clothiaux E. E. and Zhang F. (2021): Ensemble-Based Assimilation of Satellite All-Sky Microwave Radiances Improves Intensity and Rainfall Predictions for Hurricane Harvey (2017). *Geophysical Research Letters*. doi: 10.1029/2021GL096410.
9. Hartman, C. M., Chen X., Clothiaux E. E. and **Chan M.-Y.** (2021): Improving the Analysis and Forecast of Hurricane Dorian (2019) with Simultaneous Assimilation of GOES-16 All-Sky Infrared Brightness Temperatures and Tail Doppler Radar Radial Velocities. *Monthly Weather Review*. doi: 10.1175/MWR-D-20-0338.1.
10. He, J., Ma X., Ge X., Liu J., Cheng W., **Chan M.-Y.** and Xiao Z. (2021): Variational Quality Control of Non-Gaussian Innovations in the GRAPES m3DVAR System: Mass Field Evaluation of Assimilation Experiments. Advances in Atmospheric Sciences. doi: 10.1007/s00376-021-0336-3.

11. **Chan, M.-Y.**, Anderson J. L. and Chen X. (2020): An Efficient Bi-Gaussian Ensemble Kalman Filter for Satellite Infrared Radiance Data Assimilation. *Monthly Weather Review.* doi: 10.1175/MWR-D-20-0142.1.
12. **Chan, M.-Y.**, Zhang F., Chen X. and Leung R. L. (2020): Impacts of Assimilating All-sky Satellite Infrared Radiances on Convection-Permitting Analysis and Prediction of Tropical Convection. *Monthly Weather Review.* doi: 10.1175/MWR-D-19-0343.1.
13. **Chan, M. Y.**, Lo, J. C. and Orton, T. (2018): The structure of tropical Sumatra squalls. *Weather*. doi: 10.1002/wea.3375.

Manuscripts in Progress

1. Luszczak W., **Chan, M.-Y.** (*minor revisions*): Using Cosmic Rays to Predict the Weather: Meteorological Data Assimilation of Atmospheric Muon Flux Data. *Physical Review D. Projected publication date: 2026.*
2. **Chan, M.-Y.**, Satterfield E., Hyer E., Rubin J. (*major revisions*): Distribution-respecting Model-Space Localization for the Non-Variational Ensemble Data Assimilation of Non-Local Observations: Formulation and Experiments with Clear-sky Infrared Radiances. *Will submit to Monthly Weather Review. Projected publication date: 2026*
3. Chin-Hsuan Peng, Chen X., **Chan M.-Y.**, Leung L. R., Feng Z. (*under review*): Enhancing Convection Forecast during MJO Initiation Using High-Resolution All-Sky Infrared Radiance Assimilation. *Will submit to Journal of Advances in Modeling Earth Systems. Projected publication date: 2026*

Current & Pending Funding Support

Principal Investigator
Project Title: Improving the Navy's Numerical Atmospheric Predictions by Advancing Novel Transformative Low-Cost Forecast Ensemble Creation Methods
Agency: Office of Naval Research
Solicitation: Young Investigator Program
Award Period: 01 October 2024 to 30 September 2027
Amount Requested: $723,810
Outcome: Funded and ongoing.

Principal Investigator
Project Title: Will Improving Land States Benefit S2S Forecasts? Novel Assessments Using Realistic Land State Uncertainties and Strongly-Coupled Land-Atmosphere All-Sky Satellite Infrared Radiance Data Assimilation
Agency: Weather Program Office (WPO), National Oceanic and Atmospheric Administration (NOAA)
Solicitation: Subseasonal to Seasonal Grant Competition (NOAA-OAR-WPO-2025-28599)
Award Period: 01 August 2026 to 31 July 2029
Amount Requested: $1,025,757
Outcome: Recommended for funding.

Co-Principal Investigator
Project Title: Astroparticle Meteorology: Integrating Astroparticle Physics and Meteorology for Coordinated Atmospheric Observation
Agency: National Science Foundation
Solicitation: Growing Convergence Research (GCR)
Award Period: 01 January 2027 to 31 December 2031
Amount Requested: $3,211,911
Outcome: Under review.

Co-Principal Investigator
Project Title: GRID-AI: Great Lakes Resilient Infrastructure & Decision making through AI
Agency: Department of Energy
Solicitation: DE-FOA-0003600
Award Period: 01 September 2026 to 31 August 2029
Amount Requested: $5,000,000
Outcome: Under review.

Research Fellowships

National Center for Atmospheric Research	Advanced Study Program (ASP) Postdoctoral Fellowship	2022
National Center for Atmospheric Research	Advanced Study Program (ASP) Graduate Visitor Program Fellowship	2019
The Pennsylvania State University	University Graduate Fellowship	2017
The Pennsylvania State University	Arnulf I. Muan Graduate Fellowship	2017

Other Research-Related Awards

The Pennsylvania State University	John C. Wyngaard Graduate Research Award	2022
American Meteorological Society Annual Meeting 2021	First Place Oral Presentation Winner in the Student Competition	2021
The Pennsylvania State University	Second Place Winner for the Graduate Research Showcase	2021
Fourth Midwest Student Conference on Atmospheric Research	Outstanding Oral Presentation	2020
The Pennsylvania State University	Hans Neuberger Award (for excellent teaching of meteorology)	2019

Invited Seminars

1. Advancing the Data Assimilation of Observations into Numerical Weather Prediction
   Department of Meteorology and Atmospheric Science, The Pennsylvania State University (Aug 2025)

2. Ensemble Data Assimilation (EnsDA): Improving Atmospheric Forecasts by Fusing Models with Observations
   Department of Engineering Physics, Air Force Institute of Technology (May 15, 2025)

3. Ensemble Data Assimilation (EnsDA): Creating Weather Forecasts by Marrying Ensembles and Observations
   29th Annual Weather, Water, and Climate Symposium, The Ohio State University (Mar 21, 2025)

4. Advancing the Geospatial Big Data Fusion of Observations and Forecast Models
   Department of Scientific Computing, Florida State University (Aug 28, 2024)

5. Improving the Ensemble Data Assimilation of Geostationary Satellite Infrared Imagery
   Department of Atmospheric Science, Colorado State University (Nov 16, 2023)

6. Improving the analysis and forecasts of tropical mesoscale convective systems by advancing the ensemble data assimilation of satellite infrared imagery
   Mesoscale and Microscale Meteorology Laboratory, National Center for Atmospheric Research, USA (June 2023)

7. Improving the analysis and forecasts of tropical mesoscale convective systems by advancing the ensemble data assimilation of satellite infrared imagery
   Naval Research Laboratory, USA (June 2023)

8. The Bi-Gaussian Ensemble Kalman Filter (BGEnKF): A Cloud-Aware Ensemble Data Assimilation Method
   Environmental Modeling Center, National Center for Environmental Prediction (Dec 2022)

9. Improving the Analyses and Forecasts of Tropical Mesoscale Convective Systems by Advancing the Ensemble Data Assimilation of Geostationary Satellite Infrared Radiances
   Center for Climate Research Singapore, Meteorological Service Singapore, Singapore (Nov 2022)

10. Restraining Tropical Chaos with Satellite Observations
    Special Programme in Science, National University of Singapore, Singapore (Sept 2021)

Conference Presentations

1. ***(invited)*** Benefitting NOAA through Improving the Exploitation of Observations in Ensemble Data Assimilation
   Unifying Innovations in Forecasting Capabilities Workshop (2025; UIFCW)

2. Advancing EnKF-based Infrared Radiance DA through Understanding and Mitigating Non-Gaussian Artefacts

American Meteorological Society's 29th Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (2025)

3. A Dime a Hundred: Cost Effective Large Ensembles through Probit-space Ensemble Size Expansion for Gaussian Copulas (PESE-GC)
   American Meteorological Society's Fourth Symposium on Community Modelling and Innovation (2025)

4. A high-resolution Tropical Mesoscale Convective System Reanalysis (TMeCSR; "tea-mixer")
   American Meteorological Society's Second Symposium on the Future of Weather, Forecasting, and Practice (2024)

5. Mitigating the curse of small ensembles with Probit-space Ensemble Size Expansion for Gaussian Copulas (PESE-GC; "peace gee-see")
   American Meteorological Society's 28th Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (2024)

6. A high-resolution Tropical Mesoscale Convective System Reanalysis (TMeCSR; "tea-mixer")
   15th International Conference on Mesoscale Convective Systems (2023)

7. Mitigating the curse of small ensembles with Probit-space Ensemble Size Expansion for Gaussian Copulas (PESE-GC; "peace gee-see")
   The 9th International Symposium for Data Assimilation (2023)

8. The Potential Benefits of Handling Mixture Statistics via a Bi-Gaussian EnKF: Tests with All-Sky Satellite Infrared Radiances
   American Meteorological Society's 27th Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (2023)

9. On the Importance of Parallel EnKFs for All-sky Infrared Data Assimilation
   The 8th International Symposium for Data Assimilation (2022)

10. An Efficient Bi-Gaussian Ensemble Kalman Filter (BGEnKF) for Satellite Infrared Data Assimilation
    The 8th International Symposium for Data Assimilation (2022)

11. On the Importance of Parallel EnKFs for All-sky Infrared Data Assimilation
    American Meteorological Society's 35th Conference on Hurricanes and Tropical Meteorology (2022)

12. An Efficient Bi-Gaussian Ensemble Kalman Filter (BGEnKF) for Satellite Infrared Data Assimilation
    American Meteorological Society's 26th Conference on Integrated Observing and Assimilation Systems for Atmosphere, Oceans and Land Surface (2022)

13. Improving Analyses and Forecasts of a Tropical Squall Line using Geostationary Infrared Observations
    Asia Oceania Geosciences Society's Annual Meeting (2021)

14. An Efficient Bi-Gaussian Ensemble Kalman Filter (BGEnKF) for Satellite Infrared Data Assimilation
    American Meteorological Society's 25th Conference on Integrated Observing and Assimilation Systems for Atmosphere, Oceans and Land Surface (2021)

15. Improving Analyses and Forecasts of a Tropical Squall Line using Geostationary Infrared Observations
    American Meteorological Society's 24th Conference on Satellite Meteorology, Oceanography and Climatology (2021)

16. Improving Analyses and Forecasts of a Tropical Squall Line using Geostationary Infrared Observations
    Fourth Midwest Student Conference on Atmospheric Research, University of Illinois at Urbana-Champaign (2020)

17. All-sky Geostationary Infrared Data Assimilation over the Tropics
    Ninth Annual Young Scientist Symposium on Atmospheric Research, Colorado State University (2019)

18. Potential impacts of assimilating All-Sky Satellite Infrared Radiances on Convention-Permitting Analysis and Prediction of Tropical Convection
    Eighth American Meteorological Society Symposium on the Joint Center for Satellite Data Assimilation (JCSDA; 2019)

Conference Session Chair

- American Meteorological Society's 29th Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (2025)
- American Meteorological Society's 28th Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (2024)

Other Research-related Professional Activities

- Member of the American Meteorological Society (AMS)
- Member of the American Geophysical Union (AGU)
- Peer Reviewer for manuscripts submitted to research journals at AMS, AGU, the European Geosciences Union (EGU), and the Royal Meteorological Society (RMS).
- Associate Editor of the AMS Monthly Weather Review journal.
- Editor of the Springer Nature journal Advances in Atmospheric Sciences.

Service Roles (The Ohio State University)

- Faculty member on the Graduate Studies Committee, Department of Geography
- Graduate Faculty Representative, The Graduate School
- Curriculum overhaul: Participated in the overhauling of the undergraduate Atmospheric Science Program major curriculum. My main contributions are the creation and teaching of two new atmospheric science courses to ensure the curriculum complies with federal requirements.