

Man-Yau (“Joseph”) Chan

Curriculum Vitae

RESEARCH INTERESTS

Ensemble data assimilation (DA)
Earth system prediction and data
Tropical meteorology

EDUCATION

DEC 2022 **Doctorate in Meteorology and Atmospheric Science**
THE PENNSYLVANIA STATE UNIVERSITY

MAY 2017 **Bachelors in Science (Physics), Honors with Distinction**
NATIONAL UNIVERSITY OF SINGAPORE

FELLOWSHIPS

2022 **Advanced Study Program (ASP) Post-doctoral Fellowship**
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH (NCAR)

Awarded a 2 year postdoctoral fellowship to work on novel methods to improve weather and land surface forecasts through the utilization of satellite observation.

2019 **Advanced Study Program (ASP) Graduate Visitor Program (GVP) Fellowship**
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH (NCAR)

Awarded a 3-month fellowship to visit & collaborate with an NCAR scientist on novel DA algorithms

2017 **University Graduate Fellowship & Arnulf I. Muan Graduate Fellowship**
THE PENNSYLVANIA STATE UNIVERSITY

Awarded 2 one-year fellowships in recognition of academic excellence to support the tuition and stipend for my Ph.D. studies in the Department of Meteorology and Atmospheric Sciences.

📍 Room 363, NCAR Mesa Laboratory Tower B
1850 Table Mesa Dr, CO 80305
✉ manyau@ucar.edu

AWARDS

2022 **John C. Wyngaard Graduate Research Award**
THE PENNSYLVANIA STATE UNIVERSITY
(PSU) DEPARTMENT OF METEOROLOGY
AND ATMOSPHERIC SCIENCE

Received an award for academic and research excellence throughout my PhD studies in PSU’s Department of Meteorology and Atmospheric Science.

2021 **First Place Oral Presentation Winner in the Student Competition**
AMERICAN METEOROLOGICAL SOCIETY
ANNUAL MEETING 2021 24TH CONFERENCE ON SATELLITE METEOROLOGY,
OCEANOGRAPHY AND CLIMATOLOGY

Awarded first place in the Student Competition for an oral presentation on the impacts of assimilating all-sky geostationary satellite infrared radiance observations on a tropical squall line.

2021 **Second Place Winner for the Graduate Research Showcase**
THE PENNSYLVANIA STATE UNIVERSITY
(PSU) COLLEGE OF EARTH AND MINERAL
SCIENCES (EMS)

Awarded second place for a presentation to the broader EMS community that showcased my PhD research on geostationary satellite infrared radiance data assimilation.

2020 **Outstanding Oral Presentation**
FOURTH MIDWEST STUDENT CONFERENCE ON ATMOSPHERIC RESEARCH

Outstanding oral presentation on the impacts of assimilating all-sky geostationary satellite infrared radiance observations on a tropical squall line.

2019 **Hans Neuberger Award**
THE PENNSYLVANIA STATE UNIVERSITY

Awarded for the excellent teaching of Meteorology.

WORK HISTORY (PART 1)

JAN 2024 – FUTURE

Department of Geography, The Ohio State University

Assistant Professor

I will be developing novel data assimilation methods to convert satellite observations into enhancements for Earth systems datasets and forecasts.

JAN 2023 – DEC 2023

National Center for Atmospheric Research

Advanced Study Program Postdoctoral Fellow

I will be developing novel data assimilation methods to convert satellite observations into enhancements for Earth systems datasets and forecasts.

APR 2019 – DEC 2022

The Pennsylvania State University

Research Assistant

Researched on applications of all-sky geostationary infrared radiance observations ensemble data assimilation to improve forecasts and analyses of tropical mesoscale convective systems. Also worked on improving ensemble data assimilation algorithms for assimilating nonlinear observations.

JAN 2019 – APR 2019

The Pennsylvania State University

Course Instructor

Taught an introductory course on programming for undergraduates in the Department of Meteorology and Atmospheric Sciences (METEO 273). The course covered fundamental concepts in programming and syntax. Worked together with a faculty member teaching another group in the same course to create course materials. Also graded the assignments, tests and final projects.

AUG 2018 – JAN 2019

The Pennsylvania State University

Research Assistant

Researched on applications of all-sky geostationary infrared radiance observations ensemble data assimilation to improve forecasts and analyses of tropical convection.

WORK HISTORY (PART 2)

JULY 2015 – MAY 2017

National University of Singapore, Special Programme in Science

Student Mentor

Facilitated weekly sessions for a graded course on the Universe, with topics that ranged from stellar physics to cosmology. The attendees were an even mixture of Physics, Life Science and Chemistry majors. Also interviewed and decided on freshmen applications to the Special Programme in Science, performed viva voce for and graded the research of a sophomore group in the Special Programme in Science, and determined the acceptance of more freshmen research proposals.

MAY 2015 – AUG 2015

Center for Climate Research Singapore

Intern

Learnt and employed numerical weather models with a high performance computing cluster to produce weather predictions. Also created computer scripts and interfaces to assist in daily forecasts and research.

OTHER TEACHING EXPERIENCES

JAN 2012 – DEC 2016

City Harvest Church Tuition Ministry

Volunteer Teacher

Taught Physics and Mathematics for secondary school students on a voluntary basis. Many of these students come from underprivileged families and/or are at risk of under-performing for their graduation national examinations.

JAN 2013 – DEC 2014

Tuition Teacher

Taught extra classes for General Paper for students taking the Singapore-Cambridge General Certificate of Education Advanced Level examinations.

FIRST-AUTHORED PUBLICATIONS

- 1 **Chan, M.-Y.**, Chen X. and Anderson J. (2023): The potential benefits of handling mixture statistics via a bi-Gaussian EnKF: tests with all-sky satellite infrared radiances. *Journal of Advances in Modeling Earth Systems*. doi: 10.1029/2022MS003357
- 2 **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
- 3 **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
- 4 **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
- 5 **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
- 6 **Chan, M. Y.**, Lo, J. C. and Orton, T. (2019), The structure of tropical Sumatra squalls. *Weather*. doi:10.1002/wea.3375

CO-AUTHORED PUBLICATIONS

- 1 Hartman, C. M., Chen X. and **Chan M.-Y.** (2023): 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
- 2 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
- 3 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
- 4 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

INVITED SEMINARS

2023 Mesoscale and Microscale Meteorology Laboratory, National Center for Atmospheric Research, USA

Gave an invited seminar on 1) improving the analyses and predictions of tropical mesoscale convective systems through assimilating satellite IR observations, 2) a new high resolution Tropical Mesoscale Convective System Reanalysis (TMeCSR), and 3) enhancing the impacts of IR data assimilation using a novel and efficient bi-Gaussian EnKF

2023 Naval Research Laboratory, USA

Gave an invited seminar on 1) improving the analyses and predictions of tropical mesoscale convective systems through assimilating satellite IR observations, 2) a new high resolution Tropical Mesoscale Convective System Reanalysis (TMeCSR), and 3) enhancing the impacts of IR data assimilation using a novel and efficient bi-Gaussian EnKF

2022 Environmental Modeling Center, National Center for Environmental Prediction, USA

Gave an invited seminar on advancing the data assimilation of geostationary satellite IR observations through advancing an efficient bi-Gaussian EnKF.

2022 Center for Climate Research Singapore, Meteorological Service Singapore, Singapore

Gave an hour-long invited seminar on 1) improving the analyses and predictions of tropical mesoscale convective systems through assimilating satellite IR observations, and 2) enhancing these improvements through using a novel and efficient bi-Gaussian EnKF.

2021 Special Programme in Science, National University of Singapore, Singapore

Gave an hour-long informal invited seminar on satellite data assimilation to a mixture of scientists and undergraduates studying life science, chemistry and physics.

CONFERENCE PRESENTATIONS

2022 8th International Symposium on Data Assimilation

Gave two oral presentations: 1) on improving satellite IR data assimilation using an efficient bi-Gaussian EnKF (BGENKF), and 2) on the severe dry biases introduced by the sequential assimilation of satellite IR observations.

2022 American Meteorological Society 35th Conference on Hurricanes and Tropical Meteorology

Gave an oral presentation on the drawbacks (severely dry biased increments and MPI bottlenecks) of using a sequential ensemble Kalman filter to assimilate satellite IR observations.

2022 American Meteorological Society Annual Meeting 2022

Gave an oral presentation on improving satellite IR data assimilation using an efficient bi-Gaussian EnKF (BGENKF).

2021 American Meteorological Society Annual Meeting 2021

Gave two oral presentations: 1) improving the analyses and forecasts of a tropical squall using geostationary IR observations, and 2) an efficient bi-Gaussian EnKF (BGENKF) for satellite IR data assimilation.

2020 Fourth Midwest Student Conference on Atmospheric Research, University of Illinois at Urbana-Champaign

Gave an oral presentation on improving analyses and forecasts of a tropical squall using geostationary IR observations.

2020 American Meteorological Society Annual Meeting 2020

Presented a poster on the potential impacts of assimilating all-sky satellite infrared radiances on the analyses and prediction of tropical convection.

2019 Ninth Annual Young Scientist Symposium on Atmospheric Research, Colorado State University

Gave an oral presentation on the potential impacts of assimilating all-sky satellite infrared radiances on the analyses and prediction of tropical convection.