

# Yuan-Ming Cheng

**National Research Council (NRC) Postdoctoral Research Associate**

NOAA Physical Sciences Laboratory | 325 Broadway Boulder, Colorado 80305

yuan-ming.cheng@noaa.gov | 303-497-3193

## EDUCATION

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**Ph.D., Atmospheric Sciences, University at Albany, State University of New York** 2019

Advisor: Professor Chris D. Thorncroft

Thesis title: Variability of African easterly waves

**M.S., Atmospheric Sciences, National Taiwan University** 2011

Advisor: Professor Chun-Chieh Wu

Thesis title: The role of boundary layer dynamical processes in tropical cyclone intensity

**B.S., Chemical Engineering, National Taiwan University** 2009

Minor in Atmospheric Sciences

## APPOINTMENTS

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**Postdoctoral Research Associate at NOAA PSL** 2019–present

- I lead a project funded by the NRC and NOAA to work with Dr. George N. Kiladis and his group on tropical circulations at the synoptic to subseasonal time scales and their interactions with mid-latitude circulations and mesoscale convective systems.
- I perform extensive statistical analysis, such as principal component, power spectrum, and regression analyses, of observations and reanalysis data and compare results against an empirical dynamical model.
- I develop process-level diagnostics to understand and visualize physical mechanisms. I present the results at conferences and publish in journals.

**Graduate Research Assistant at University at Albany** 2014–2019

- I characterized the variability of African easterly waves and documented their interactions with equatorial and mid-latitude circulations by utilizing statistical analyses, case studies, and idealized modeling.
- I investigated tropical cyclone genesis using WRF mechanism-denial experiments and verified them against observations. I also systematically tested model sensitivity and stability to parameterization.

**Research Assistant at National Taiwan University** 2013–2014

- I conducted WRF ensemble simulations and investigated the dynamics of secondary eyewall formation in tropical cyclones. I also explored various facets of tropical cyclones such as rapid intensification, boundary layer dynamics, and oceanic feedback.

**Weather Officer as a Second Lieutenant, Taiwan Air Force** 2011–2012

- I led daily weather discussions and issued daily forecasts to military personnel as an operational forecaster on a team for each shift. I provided flight-route nowcasts and recommended go-no go flight decisions.

## HONORS AND AWARDS

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National Research Council Research Associateship Award 2019–2022

Dean's Award for the Best M.S. Thesis, College of Science, National Taiwan University 2011

## FIELD EXPERIENCE

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**DOTSTAR–Dropwindsonde Observations for Typhoon Surveillance near TAIwan Region 2010**  
As a surveillance flight quality control specialist, I worked with flight crews and used the NCAR-Atmospheric Sounding Processing Environment program to collect data on research flights into typhoons.

**ATOMIC–Atlantic Tradewind Ocean–Atmosphere Mesoscale Interaction Campaign 2020**  
I led daily weather briefings to inform observations for the field campaign.

## REFEREED PUBLICATIONS

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**Cheng, Y.-M.**, S. Tulich, G. N. Kiladis, and J. Dias, 2022: Two extratropical pathways to forcing tropical convective disturbances *J. Climate*, *accepted*, doi.org/10.1175/JCLI-D-22-0171.1.

**Cheng, Y.-M.**, C. D. Thorncroft, and G. N. Kiladis: Mixed-Rossby gravity waves and their relationship with African easterly waves, *in prep.*

**Cheng, Y.-M.**, J. J. Alland, K. L. Corbosiero, C. D. Thorncroft and B. H. Tang: Tropical cyclone genesis associated with African easterly waves north of the African easterly jet, *in prep.*

Laura A. Holt, François Lott, Rolando R. Garcia, George N. Kiladis, **Y.-M. Cheng** et al., 2020: An evaluation of tropical waves and wave forcing of the QBO in the QBOi models. *Quart. J. Roy. Met. Soc.*, *148*,1541–1567, doi.org/10.1002/qj.3827.

**Cheng, Y.-M.**, C. D. Thorncroft, and G. N. Kiladis, 2019: Two contrasting behaviors of African easterly waves. *J. Atmos. Sci.*, *76*, 1753–1768, doi.org/10.1175/JAS-D-18-0300.1.

## BOOK CHAPTER

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Antoine Venaille, Juliana Dias, **Yuan-Ming Cheng**: Large-scale Atmospheric Dynamics: Equatorial Waves in *Atmospheric Dynamics*, currently being edited by Caroline Muller, Riwal Plougonven, and Gwendal Rivière

## PROFESSIONAL DEVELOPMENT

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**Mind the Gap 2 Workshop 2022**  
Selected to participate in a National Science Foundation-sponsored workshop dedicated to educating the next generation of atmospheric scientists for careers in industry.

**NASA Summer School at the Jet Propulsion Laboratory 2016**  
Selected to attend a NASA summer school where the next generation of scientists were brought together to focus on using satellite observations to improve and advance climate models.

## SKILLS

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<b>Programming</b>	NCL, Python, Fortran, GrADS, MATLAB, Shell script, GitHub, CDO, NCO
<b>Modeling</b>	WRF, MM5, Dynamical Research Empirical Atmospheric Model (from Univ. of Reading)
<b>Languages</b>	English (fluent), Mandarin (native) and Taiwanese (fluent)

## SERVICES

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**Reviewer** for JCLI, MWR, JAS, JAMC, JGR Atmospheres, and IPCC AR6 2019–present  
**Co-chair** of the Tropical Waves Session at the 35th Conference on Hurricanes and Tropical Meteorology 2022  
**Lead and coordinator of outreach programs** at University at Albany 2015–2019

## SELECTED CONFERENCE PRESENTATIONS

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**Cheng, Y.-M.**, G. N. Kiladis, J. Dias, and S. Tulich, 2022: Impact of convectively coupled equatorial waves on the characteristics and organization of MCSs. 35<sup>th</sup> Conference on Hurricanes and Tropical Meteorology, New Orleans, LA.

**Cheng, Y.-M.**, S. Tulich, and G. N. Kiladis, 2022: ENSO impacts on the extratropical forcing of convectively coupled Kelvin waves. 102<sup>th</sup> AMS Annual Meeting, online.

**Cheng, Y.-M.**, S. Tulich, and G. Kiladis, 2021: Two extratropical pathways to forcing tropical convection. 34<sup>th</sup> Conference on Hurricanes and Tropical Meteorology, online.

**Cheng, Y.-M.**, C. D. Thorncroft, and G. Kiladis, 2020: African easterly wave characteristics: climate variability and trends. 100<sup>th</sup> AMS Annual Meeting, Boston, MA.

**Cheng, Y.-M.**, C. D. Thorncroft, and A. Brammer, 2018: Intraseasonal variability of African easterly waves. 2<sup>nd</sup> International Conference on Subseasonal to Seasonal Prediction, Boulder, CO.

**Cheng, Y.-M.**, and C. D. Thorncroft, 2018: Variability of African easterly wave structures. 33<sup>rd</sup> Conference on Hurricanes and Tropical Meteorology, Ponte Vedra, FL.

Alland, J. J., and **Y.-M. Cheng**, 2018: The role of African easterly waves north of the African easterly jet on tropical cyclogenesis. 33<sup>rd</sup> Conference on Hurricanes and Tropical Meteorology, Ponte Vedra, FL.

**Cheng, Y.-M.**, C. D. Thorncroft, and G. N. Kiladis, 2017: A survey of synoptic waves over West Africa. 8<sup>th</sup> Northeast Tropical Meteorology Workshop, Rensselaerville, NY.

**Cheng, Y.-M.**, and C. D. Thorncroft, 2017: A survey of synoptic waves over West Africa. General Assembly 2017, European Geosciences Union, Vienna, Austria.

**Cheng, Y.-M.** and C. D. Thorncroft, 2016: Three-dimensional structure of synoptic waves over West Africa based on empirical orthogonal functions. NOAA's 41<sup>st</sup> Climate Diagnostics and Prediction Workshop, Orono, Maine.

**Cheng, Y.-M.**, and C. D. Thorncroft, 2016: Three-dimensional structure of African easterly waves based on empirical orthogonal functions. 32<sup>nd</sup> Conference on Hurricanes and Tropical Meteorology, San Juan, PR.

**Cheng, Y.-M.**, and C.-C. Wu, 2014: The role of boundary layer dynamics on tropical cyclone intensity. 31<sup>st</sup> Conference on Hurricanes and Tropical Meteorology, San Diego, CA.