Qiu Yang

Research Scientist at Pacific Northwest National Laboratory (PNNL)
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(Last Update: August 21, 2020)

RESEARCH INTERESTS

Multi-scale organization of tropical convection such as Madden-Julian Oscillation, diurnal cycle, ITCZ, convectively coupled equatorial waves, mesoscale convective systems, Monsoon, and El Niño

Mathematical modeling of large-scale atmospheric flows, such as multi-scale asymptotic models and stochastic dynamic models

Computational fluid dynamics methods for idealized and intermediate models, cloud-resolving simulations, and GCMs

Convective parameterization for interactions between moisture and large-scale circulation

Geophysical fluid dynamics theory

EMPLOYMENT

Research Scientist 2020 Sep.–present

- Computational Climate Science Group, Earth & Biological Sciences Directorate, Pacific Northwest National Laboratory (PNNL), USA
- Address: 902 Battelle Blvd, Richland, WA 99354

Academic Visitor 2018 Mar.–May

- Atmospheric Modeling & Predictability Section of Climate and Global Dynamics Laboratory, National Center for Atmospheric Research (NCAR), USA
- Host: Mitchell Moncrieff

Academic Visitor 2017 Sep.–Dec., 2019 May–Jul.

- Department of Mathematics and Statistics, University of Victoria (UVic), Canada
- Host: Boualem Khouider

Postdoc Associate 2017 Jul.–2020 Aug.

- Address: Center for Atmosphere Ocean Science, Courant Institute, New York University, USA
- Funding source: Center for Prototype Climate Modeling in NYU Abu Dhabi, UAE
- Research Topic: Upscale Impact of Mesoscale Convective Systems on Tropical Weather and Climate
- Co-mentored by Andrew Majda (NYU), Boualem Khouider (UVic) and Mitchell Moncrieff (NCAR)

EDUCATION

Ph.D. in Mathematics and Atmosphere and Ocean Sciences 2012 fall–2017 spring

- Center for Atmosphere Ocean Science, Courant Institute, New York University, NY, USA

· Thesis: Multi-Scale Models for the Scale Interaction of Organized Tropical Convection
· Thesis Advisor: Andrew J. Majda

B.S. in Mathematics 2008 fall–2012 spring

· Zhiyuan College, Shanghai Jiao Tong University, Shanghai, China
· Thesis: Optimal Transport of Water in the Biological Network
· Thesis Advisor: David Cai (Courant, NYU) and Dan Hu (SJTU)

PUBLICATIONS

(* denotes corresponding author)

2019

[10] **Yang, Q.***, Andrew J. Majda, Brenowitz, N.D., 2019: *Effects of Rotation on the Multiscale Organization of Convection in a Global 2D Cloud Resolving Model*, Journal of the Atmospheric Sciences, 76(11), pp.3669-3696.

[9] **Yang, Q.***, Andrew J. Majda, Mitchell W. Moncrieff, 2019: *Upscale Impact of Mesoscale Convective Systems and Its Parameterization in An Idealized GCM for An MJO Analog above the Equator*, Journal of the Atmospheric Sciences, 76(3), pp.865-892.

[8] **Yang, Q.**, Boualem Khouider*, Andrew J. Majda, Michele De La Chevrotiere, 2019: *Northward Propagation, Initiation and Termination of Boreal Summer Intraseasonal Oscillations in a Zonally Symmetric Model*, Journal of the Atmospheric Sciences, 76(2), pp.639-668.

[7] **Yang, Q.***, Majda, A.J., 2019: *Upscale Impact of Mesoscale Disturbances of Tropical Convection on 2-Day Waves*. Journal of the Atmospheric Sciences, 76(1), pp.171-194.

2018

[6] Brenowitz, N.D.*, Majda, A.J., **Yang, Q.**, 2018: *The Multiscale Impacts of Organized Convection in Global 2-D Cloud-Resolving Models*. Journal of Advances in Modeling Earth Systems, 10(8), pp.2009-2025.

[5] **Yang, Q.*** and Majda, A.J., 2018: *Upscale Impact of Mesoscale Disturbances of Tropical Convection on Convectively Coupled Kelvin Waves*. Journal of the Atmospheric Sciences, 75(1), pp.85-111.

2014-2017

[4] **Yang, Q.***, Majda, A.J. and Khouider B., 2017: *ITCZ Breakdown and Its Upscale Impact on the Planetary-Scale Circulation over the Eastern Pacific*. Journal of the Atmospheric Sciences, 74(12), pp.4023-4045.

[3] **Yang, Q.*** and Majda, A.J., 2017: *Upscale Impact of Mesoscale Disturbances of Tropical Convection on Synoptic-Scale Equatorial Waves in Two-Dimensional Flows*. Journal of the Atmospheric Sciences, 74(9), pp.3099-3120.

[2] Majda, A.J. and **Yang, Q.***, 2016: *A Multi-Scale Model for the Intraseasonal Impact of the Diurnal Cycle over the Maritime Continent on the Madden-Julian Oscillation*. Journal of the Atmospheric Sciences, 73(2), pp.579-604.

[1] **Yang, Q.*** and Majda, A.J., 2014: *A Multi-scale Model for the Intraseasonal Impact of the Diurnal Cycle of Tropical Convection*. Theoretical and Computational Fluid Dynamics, 28(6), pp.605-633.

CONFERENCES AND TALKS

Jan. 8, 2020 Seminar talk at the Institute of Natural Sciences, Shanghai Jiao Tong University. The title of my talk is "Upscale Impact of Mesoscale Convective Systems on the Madden-Julian Oscillation and Its Parameterization in a Coarse-Resolution GCM".

Jan. 3, 2020 Seminar talk at the Atmosphere-Ocean Department, Peking University. The title of

my talk is "Upscale Impact of Mesoscale Convective Systems on the Madden-Julian Oscillation and Its Parameterization in a Coarse-Resolution GCM".

Jan. 2, 2020 Seminar talk at the Institute of Atmospheric Physics, Chinese Academy of Sciences. The title of my talk is "Upscale Impact of Mesoscale Convective Systems on the Madden-Julian Oscillation and Its Parameterization in a Coarse-Resolution GCM".

Dec. 27, 2019 Seminar talk at the Atmosphere-Ocean Department, Fudan University. The title of my talk is "Upscale Impact of Mesoscale Convective Systems on the Madden-Julian Oscillation and Its Parameterization in a Coarse-Resolution GCM".

Dec. 11, 2019 AGU fall meeting at San Francisco, poster presentation entitled "Upscale Impact of Mesoscale Convective Systems on the Madden-Julian Oscillation and Its Parameterization in a Coarse-Resolution GCM".

Jul. 25, 2019 Celebration conference in honor of Professor Andrew J. Majdas 70th birthday, "Scientific Grand Challenges and New Perspectives in Applied Mathematics: Ocean, Atmosphere and Climate Sciences" at University of Victoria. Oral talk entitled "Upscale Impact of Mesoscale Convective Systems on the CCEWs and MJO and Its Parameterization in an Idealized GCM".

Dec. 21, 2018 2018 Young Mathematician Forum at Department of Mathematical Sciences, Shanghai Jiao Tong University, China, Oral talk entitled "Multi-scale interactions of organized tropical convection: from multi-scale asymptotic models to comprehensive numerical simulations"

Dec. 19, 2018 Academic Colloquium at Department of Atmospheric and Oceanic Sciences, Fudan University, China, Oral talk entitled "Upscale Impact of Mesoscale Convective Systems and Its Parameterization in an Idealized GCM for a MJO Analog above the Equator"

Dec. 10, 2018 AGU fall meeting at Washington, DC, poster presentation entitled "Upscale Impact of Mesoscale Convective Systems and Its Parameterization in an Idealized GCM for a MJO Analog above the Equator"

May 03, 2018 Climate & Global Dynamics (CGD) research report at NCAR, Oral Talk entitled "*Upscale Impact of Mesoscale Convective Systems and Its Parameterization in GCMs: an idealized testbed*"

Apr. 16-20, 2018 American Meteorological Society's 33rd Conference on Hurricanes and Tropical Meteorology, Oral Talk entitled "*Upscale Impact of Mesoscale Disturbances of Tropical Convection on Convectively Coupled Kelvin Waves*"

Dec. 11-15, 2017 AGU fall meeting at New Orleans, Poster Presentation

Nov. 29, 2017 Applied math seminar in Department of Mathematics and Statistics at UVic, Victoria, Canada, Oral Talk

May 9, 2017 Seminar talk at Department of Atmosphere Science, Princeton University, New Jersey, Oral Talk.

Dec. 12-16, 2016 AGU fall meeting at San Francisco, Poster Presentation

Sep. 15, 2016 AOCD seminar series at Department of Geology & Geophysics, Yale University, New Haven, Oral Talk.

Jan. 28-30, 2016 Multidisciplinary University Research Initiative (MURI) Workshop, New York, Oral Talk.

Sep. 2015 Columbia Workshop 'Monsoons & ITCZ: the annual cycle in the Holocene and the future', New York, USA, Poster Presentation

Apr. 2015 BIRS Workshop 'Stochasticity and Organization of Tropical Convection', Banff, Canada,

Oral Talk

Aug. 16-21, 2014 The World Weather Open Science Conference (WWOSC), Montreal, Canada, Poster Presentation

HONORS

NYU GSAS Dean's Student Travel Grant Program 2016
McCracken scholarship of New York University 2012-2017
Meritorious Award in the Mathematical Contest in Modeling 2010

TEACHING

Recitation Leader for Algebra and Calculus, MATH-UA.9.002-003 Spring 2015

COMMUNITY SERVICE

Outstanding Student Presentation Award Judge for 2019 AGU fall meeting Dec 2019
Member of the reviewer board for the MDPI journal *Atmosphere* *since Nov 2019*
Paper reviewer for *since 2017*
- *Journal of the Atmospheric Sciences*
- *Climate Dynamics*
- *Dynamics of atmospheres and oceans*
- *Journal Marine Science and Engineering*
- *Atmosphere*
- *Climate*
- *Geosciences*
- *Mathematics*

Member of American Meteorological Society and American Geophysical Union *since 2016*
Research proposal reviewer for National Science Center, Poland *June 2017*

COMPUTER SKILLS

Programming languages:
Fortran, C++, MATLAB, Python, Linux, High-Performance Computing clusters, Latex, Lyx

Running and revising codes of models:
System for Atmospheric Modeling (SAM), Weather Research and Forecasting Model (WRF), HOMME dynamic core for CAM, both deterministic and stochastic multicloud models

LANGUAGE

English: fluent; Mandarin: native

REFERENCES

Andrew J. Majda
Email: jdm11@cims.nyu.edu (Prof. Majda's administrative assistant)
Affiliation: Center for Atmosphere and Ocean Science, Courant Institute of Mathematical Sciences, New York University, USA

Mitchell W. Moncrieff
Email: moncrief@ucar.edu
Affiliation: Atmospheric Modeling & Predictability Section of Climate and Global Dynamics Laboratory, National Center for Atmospheric Research (NCAR), USA

Boualem Khouider
Email: khouider@uvic.ca
Affiliation: Department of Mathematics and Statistics, University of Victoria, Canada