Yu-Chiao Liang

Department of Atmospheric Sciences
National Taiwan University
No. 1, Sec. 4, Roosevelt Rd
Taipei, Taiwan, 10673

Phone:+886-2-33663907
yuchiaoliang@ntu.edu.tw
pamip.yuchiao@gmail.com
https://littleyuchiao.wixsite.com/yuchiao

Research Interests

I use reanalysis products and global climate models to study (i) the causes and effects of polar amplification; (ii) the large-scale atmospheric circulation forced by polar and other forcings; (iii) the global and regional hydroclimate.

Education

2018	Ph.D., Earth System Science, *University of California, Irvine, USA*
	Advisor: Dr Jin-Yi Yu
2014	M.Sc., Earth System Science, *University of California, Irvine, USA*
2010	B.Sc., Atmospheric Sciences and Mathematics, *National Taiwan University, Taiwan*

Professional Appointments

2021-	Assistant Professor, *Department of Atmospheric Sciences, National Taiwan University*
2020-21	Postdoctoral Research Scientist, *Lamont-Doherty Earth Observatory of Columbia University*
	Advisors: Drs Lorenzo M. Polvani, Michael Previdi, and Karen L. Smith
2018-20	Postdoctoral Investigator, *Physical Oceanography, Woods Hole Oceanographic Institution*
	Advisors: Drs Young-Oh Kwon, Claude Frankignoul, Gokhan Danabasoglu, and Stephen Yeager

Fellowships and Honors

2018	NATPA-SCAL Scholarship, *North America Taiwanese Professor's Association*
2018	Associate Graduate Students Travel Grants, *University of California, Irvine, USA*
2014-15	Government Scholarship for Study Abroad, *Ministry of Education, Taiwan*
2010	Research Creativity Award for Undergraduates, *National Science Council, Taiwan*
2009-10	Undergraduate Research Project Fellowship, *National Science Council, Taiwan*
2005-06	Presidential Award (top 5% students), *National Taiwan University, Taiwan*

Publications

Referred

2021

[14] Y.-N. Kuo, M.-H. Lo, and **Y.-C. Liang**, Y.-H. Tseng, and C.-W. Hsu, Terrestrial water storage anomalies emphasize interannual variations in global mean sea level evolutions during 1997-1998 and 2015-2016 El Niños, *Geophysical Research Letters*, **48**, e2021GL094104.

[13] **Liang, Y.-C.**, C. Frankignoul, Y.-O. Kwon, G. Gastineau, E. Manzini, L. Suo, G. Danabasoglu, S. Yeager, Y. Gao, J. Attema, A. Cherchi, R. Ghosh, D. Matei, J. V. Mecking, T. Tian, and Y. Zhang, Is the Impact of the Observed Arctic Sea-ice Variability on the Cold Season Atmospheric Circulation Underestimated in Large-ensemble AGCM Experiments? *Journal of Climate*, **34**, 8419-8443, doi.org:10.1175/JCLI-D-20-0578.1.

[12] **Liang, Y.-C.**, Y.-O. Kwon, and C. Frankignoul, Autumn Arctic Pacific sea-ice dipole as a source of predictability for subsequent spring Barents sea-ice condition, *Journal of Climate*, **34**, 787-804,

doi:10.1175/JCLI-D-20-0172.1.

2020

[11] **Liang, Y.-C.**, M.-H. Lo, C.-W. Lan, H. Seo, S. Yeager, C. C. Ummenhofer, R.-J. Wu, and J. D. Steffen, 2020: Amplified seasonal cycle in hydroclimate over the Amazon river basin and its plume region in the tropical Atlantic, *Nature Communications*, **11**, 4390, doi:10.1038/s41467-020-18187-0.

[10] **Liang, Y.-C.**, Y.-O. Kwon, C. Frankignoul, G. Danabasoglu, S. Yeager, A. Cherchi, Y. Gao, G. Gastineau, R. Ghosh, D. Matei, J. V. Mecking, D. Peano, L. Suo, and T. Tian, 2020: Quantification of the Arctic sea ice-driven atmospheric circulation variability in coordinated large ensemble simulations, *Geophysical Research Letters*, **47**, e2019GL085397, doi:10.1029/2019GL085397.

[9] Tseng, Y.-H., R. Ding, S. Zhao, Y.-C. Kuo, and **Y.-C. Liang**, 2020: Could the North Pacific Oscillation be modified by the initiation of East Asian winter monsoon? *Journal of Climate*, **33**, 2389-2406, doi:10.1175/JCLI-D-19-0112.1.

2013-2019

[8] Chen, C.-C., M.-H. Lo, E.-S. Im, J.-Y. Yu, **Y.-C. Liang**, W.-T. Chen, I. Tang, C.-W. Lan, R.-J. Wu, and R.-Y. Chien, 2019: Thermodynamic and dynamic responses to deforestation in the Maritime Continent: A modeling study, *Journal of Climate*, **32**, 3505-3527.

[7] **Liang, Y.-C**., M. R. Mazloff, I. Rosso, S.-W. Fang, and J.-Y. Yu, 2018: A multi-variate Empirical Orthogonal Function method to construct nitrate maps in the Southern Ocean, *Journal of Atmospheric and Oceanic Technology*, **35**, 1050-1509, doi:10.1175/JTECH-D-18-0018.1.

[6] **Liang, Y.-C.**, J.-Y. Yu, E. S. Saltzman, and F. Wang, 2017: Linking the Tropical Northern Hemisphere pattern to the Pacific warm blob and Atlantic cold blob, *Journal of Climate,* **30**, 9041-9057, doi:10.1175/JCLI-D-17-0149.1.

[5] **Liang, Y.-C.**, C.-C. Chou, J.-Y. Yu, and M.-H. Lo, 2016: Mapping the locations of asymmetric and symmetric discharge responses in global rivers to the two types of El Niño*, Environmental Research Letters*, **11**, doi:10.1088/1748-9326/11/4/044012.

[4] **Liang, Y.-C.**, J.-Y. Yu, M.-H. Lo, and C. Wang, 2015: The changing influence of El Niño on the Great Plains Low-Level Jet, *Atmospheric Science Letters*, **16**, 512-517, doi:10.1002/asl.590.

[3] **Liang, Y.-C.**, M.-H. Lo, and J.-Y. Yu, 2014: Asymmetric responses of land hydroclimatology to two types of El Niño in the Mississippi River Basin, *Geophysical Research Letters*, **41**, 582-588, doi:10.1002/2013GL058828.

[2] Young, C.-C., **Y.-C. Liang**, Y.-H. Tseng, and C.-H. Chow, 2014: Characteristics of the RAW-filtered leapfrog time-Stepping scheme in the ocean general circulation model, *Monthly Weather Review*, **142**, 434-447.

[1] Young, C.-C., Y.-H. Tseng, M.-L. Shen, **Y.-C. Liang**, M.-H. Chien, and C.-H. Chien, 2013: Software development of the Taiwan multi-scale community ocean model (TIMCOM), *Environmental Modelling and Software*, **34**, 214-219.

Under Review and In Preparation

Ghosh, R., E. Manzini, Y. Gao, G. Gastineau, A. Cherchi, C. Frankignoul, **Y.-C. Liang**, Y.-O. Kwon, L. Suo, J. V. Mecking, T. Tian, Y. Zhang, and D. Matei, A clear role of Arctic sea ice loss for the winter warm Arctic cold Eurasia trend. (under review).

Liang, Y.-C., L. M. Polvani, M. Previdi, K. L. Smith, M. R. England, and G. Chiodo, Stronger Arctic amplification from ozone-depleting substances than from carbon dioxide (under review).

Liang, Y.-C. L. M. Polvani, and I. Mitevski, Arctic amplification, and its seasonal migration, over a wide range

of CO2 forcing (under review).

Suo, L., Y. Gao., G. Gastineau, **Y.-C. Liang**, R. Ghosh, T. Tian, Y. Zhang, Y.-O. Kwon, D. Matei, O. H. Ottera, S. Yang, Simulated contribution of the interdecadal Pacific oscillation to the west-central Eurasian cooling (under review).

Other Publications

Liang, Y.-C., Y.-O. Kwon, 2021: WHOI WACCM large ensemble. Version 1.0. UCAR/NCAR - DASH Repository. https://doi.org/10.5065/djjf-da26. Accessed 20 Mar 2021.

Manzini, E., R. Ghosh, D. Matei, G. Gastineau, A. Simon, **Y.-C. Liang**, Y.-O. Kwon, A. Cherchi, and S. Yang, 2019: Identification of key processes in bridging the Arctic warming impact and its variation on decadal timescale, Blue-Action Work Package 3, Deliverable: 3.2.

Presentations

Oral:

2021

Weak atmospheric circulation responses to Arctic sea-ice loss in large0ensemble simulations, *University at Albany*, New York, USA (virtual talk).

An overview of recent Arctic climate change, *Central Weather Bureau*, Taipei, Taiwan.

The causes and consequences of Arctic amplification in large-ensemble simulations, *2021 CHIAxYMC2021*, Taipei, Taiwan (virtual meeting).

Arctic amplification and its seasonal cycle in response to abrupt CO2 forcing, *2021 CESM Workshop*, virtual session (virtual meeting).

Investigating the stratospheric response to Arctic sea-ice loss in PAMIP's transient coupled experiments, *2021 Polar-amplification MIP virtual workshop* (virtual meeting).

Stronger Arctic amplification from ozone-depleting substances than from carbon dioxide, *2021 CESM Polar Climate Working Group Meeting* (virtual meeting).

Are the Impacts of the Observed Arctic Sea-ice Variability on the Cold Season Atmospheric Circulation Underestimated in AGCM Experiments, *2021 AMS Annual Meeting* (virtual meeting).

2020

Are the Impacts of the Observed Arctic Sea-ice Variability on the Cold Season Atmospheric Circulation Underestimated in AGCM Experiments, *2020 Blue-Action Annual Meeting* (virtual meeting).

The Impact of the Observed Arctic Sea-ice Variability on the Cold Season Atmospheric Circulation in Large-ensemble AGCM Experiments, *2020 CESM Workshop*, virtual session.

Quantification of the Arctic sea ice-driven atmospheric circulation variability in coordinated large ensemble simulations, *2020 AMS Annual Meeting*, Boston, MA, USA.

An autumn Arctic Pacific sea-ice dipole as a source of predictability for subsequent spring Barents-Kara sea-ice condition, *2020 AMS Annual Meeting*, Boston, MA, USA.

Quantification of the Arctic sea ice-driven atmospheric circulation variability in coordinated large ensemble simulations, *Institute of Oceanography, National Taiwan University*, Taipei, Taiwan.

2019

Quantification of the Arctic sea ice-driven atmospheric circulation variability in coordinated large ensemble simulations, *Research Center for Environmental Changes, Academia Sinica*, Taipei, Taiwan.

Quantification of the Arctic sea ice-driven atmospheric circulation variability in coordinated large ensemble simulations, *2019 Blue-Action Annual Meeting*, Edinburgh, UK.

Quantification of the Arctic sea ice-driven atmospheric circulation variability in coordinated large ensemble simulations, *2019 WHOI Postdoc Symposium, Jonsson Center of the National Academies*,

Woods Hole, MA, USA.

Atmospheric responses to Arctic sea-ice loss in a high-top Whole Atmosphere Community Climate Model version 6 (WACCM6), *2019 PAMIP Workshop*, Totnes, UK (presented by pre-recording).

The changing impacts of El Niño and Arctic warming on mid-latitude climate variability, *Department of Atmospheric Sciences, National Taiwan University*, Taipei, Taiwan.

A multi-variate empirical orthogonal function method to construct nitrate maps in the Southern Ocean, *Department of Atmospheric Sciences, National Taiwan University*, Taipei, Taiwan.

The changing impacts of El Niño on mid-latitude hydroclimate, *Institute of Oceanography, National Taiwan University*, Taipei, Taiwan.

The Changing Impacts of El Niño and Arctic Warming on Mid-latitude Climate Variability, *Yale University*, CT, USA.

The Changing Impacts of El Niño and Arctic Warming on Mid-latitude Climate Variability, *Woods Hole Oceanographic Institution*, MA, USA.

2012-2018

A brief history of climate modeling, UC-Irvine, CA, USA.

The Arctic warming and North American climate, *CSU*, San Marcos, CA, USA.

A multi-variate EOF approach to construct nitrate maps in the Southern Ocean, *2018 Ocean Science Meeting*, Portland, OR, USA.

Arctic warming intensifies North Pacific-Atlantic ocean connectivity, *Department of Atmospheric Sciences, National Taiwan University*, Taipei, Taiwan.

Can Arctic warming intensify North Pacific-Atlantic ocean connectivity? *2017 AGU Fall Meeting*, New Orleans, CA, USA.

An atmospheric conducting mechanisms behind the synchronization of the Pacific and Atlantic blobs, *Department of Atmospheric Sciences, National Taiwan University*, Taipei, Taiwan.

Synchronization of the Pacific and Atlantic Blobs via an Atmospheric Conductor Pattern, *Research Center for Environmental Changes, Academia Sinica*, Taipei, Taiwan.

Synchronization of the Pacific and Atlantic Blobs via an Atmospheric Conductor Pattern, *2016 AGU Fall Meeting*, San Francisco, CA, USA.

The influences of changing El Niño on US hydroclimate, *Research Center for Environmental Changes, Academia Sinica*, Taipei, Taiwan.

The influences of changing El Niño on US hydroclimate, *Department of Atmospheric Sciences, National Taiwan University*, Taipei, Taiwan, Taipei, Taiwan.

Application of the third-order RAW-filtered leapfrog scheme for ocean modeling, *2012 Ocean Sciences Meeting*, Salt Lake City, UT, USA.

Poster:

Are the Impacts of the Observed Arctic Sea-ice Variability on the Cold Season Atmospheric Circulation Underestimated in AGCM Experiments, *2020 AGU Fall Meeting* (virtual meeting).

An autumn Arctic Pacific sea-ice dipole as a source of predictability for subsequent spring Barents-Kara sea-ice condition, *2020 Ocean Sciences Meeting*, San Diego, CA, USA (presented by S.-W. Fang).

Atmospheric responses to Arctic sea ice loss in a high-top atmospheric general circulation model, *CESM Annual Meeting*, Boulder, CO, USA.

Atmospheric responses to Arctic sea ice loss in a high-top atmospheric general circulation model, *15th Conference on Polar Meteorology and Oceanography*, Boulder, CO, USA (presented by S. Yeager).

Atmospheric responses to Arctic sea ice loss in a high-top atmospheric general circulation model, *2018 AGU Fall Meeting*, Washington, D.C., USA.

Mapping the locations of asymmetric and symmetric discharge responses in global rivers to the two types

of El Niño, *2015 AGU Fall Meeting*, San Francisco, CA, USA.

Distinct impacts of the two types of El Niño on the strength of Great Plains low-level jet, *2014 AGU Fall Meeting*, San Francisco, CA, USA.

Asymmetric responses of land water storage to two types of ENSO over the Mississippi river basin, *2013 AGU Fall Meeting*, San Francisco, CA, USA.

Effects of Amazon river discharge on the oceanic physics and surrounding circulation system, *2012 AGU Fall Meeting*, San Francisco, CA, USA.

Teaching Activities

Teaching Assistant

2016 Catastrophe, *University of California, Irvine,* worked with Lecturer Elizabeth Crook

2016 The Atmosphere, *University of California, Irvine,* worked with Lecturer Elizabeth Crook

2015 Data Analysis, *University of California, Irvine,* worked with Assistant Prof. Mathieu Morlighem

2015 Earth's Atmosphere, *University of California, Irvine,* worked with Prof. Jin-Yi Yu

2015 Climate Change, *University of California, Irvine,* worked with Assistant Prof. Michael Pritchard

2014 Modeling the Earth, *University of California, Irvine,* worked with Prof. François Primeau

2010 Advanced Numerical Methods and Applications (1), *National Taiwan University*

2010 Calculus, General Mathematics (2), *National Taiwan University*

2009 Calculus, General Mathematics (1), *National Taiwan University*

Certificate

2016 Machine Learning, *Stanford University*, *Coursera*.

Programming Skills

Python - publication graphics, data analysis, machine learning and deep learning tools.

NCL - publication graphics, data analysis.

MATLAB - publication graphics, data analysis, machine learning tools.

Fortran - data analysis, climate model modifications.

Linux - shell scripts.

Other Activities

- Journal manuscript referee: *Atmosphere, Climate Dynamics, Current Agriculture Research Journal, Environmental Research Letters, Geophysical Research Letters, Geoscientific Model Development, International Journal of Climatology, Journal of Climate, Journal of Geophysical Research-Oceans, Terrestrial, Atmospheric and Oceanic Sciences.*

- 2021-present, Polar Amplification Model Intercomparison Project Online Webinar, organizing committee member.

- 2021-present, Climate Hotpots In Action (CHIA) Forum Webinar, organizing committee member.

- 2021, Early Career Scientist workshop at Arctic Science Summit Week, organizing committee member.

- 2021, APECS/MRI/PAGES-ECN/PYRN/YESS group review of the Second Order Draft (SOD) of the Working Group II (WGII) contribution to the IPCC Sixth Assessment Report (AR6): *Impacts, Adaptation and Vulnerability*.

- 2019-2021, Young Earth System Scientists Community, Online Events Working Group.

- 2018-2019, Woods Hole Oceanographic Institution Post-Generals Mentoring Program.
- 2015-2016, Graduate Student Representative at Department of Earth System Science, University of California, Irvine.