

Kwun Yip Fung (Samuel)

Postdoctoral Associate in Cooperative Institute For Marine And Atmospheric Studies (CIMAS) of Rosenstiel School of Marine and Atmospheric Science (RSMAS) in the University of Miami;
Hurricane Research Division, Atlantic Oceanographic and Meteorological Laboratory (AOML), National Oceanic and Atmospheric Administration (NOAA)

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Education

The University of Texas at Austin

Texas, US

Ph.D., Geological Sciences, GPA: 3.99/4.00

2018 – 2023

Dissertation: "Improved urban extreme weather simulation by capturing urban heterogeneity"

The Chinese University of Hong Kong

Hong Kong

M.Phil., Earth and Atmospheric Sciences

2016 – 2018

Thesis: "Comparing the anthropogenic heat and global warming impacts on extreme rainfall in Southern China Pearl River Delta based on dynamical downscaling"

The Chinese University of Hong Kong

Hong Kong

B.Sc., Earth System Science, First Class Honours, GPA 3.71/4.00

2012 – 2016

Thesis: "The importance of aerosol-phase radical-radical reactions on the heterogeneous OH oxidation of organic aerosols"

Publication

- **Fung, K. Y.**, Yang, Z.-L., Niyogi, D. (2024). Capturing urban heterogeneity enhances tropical cyclones simulation in Houston. *Journal of Geophysical Research: Atmospheres*, 129(19). doi: 10.1029/2024JD040807
- **Fung, K. Y.**, Yang, Z.-L., Martilli, A., Kravenhoff, E. S., Niyogi, D. (2024). Prioritizing equity in urban heat mitigation. *PNAS nexus*, 3(9). doi: 10.1093/pnasnexus/pgae360
- **Fung K. Y.**, Yang, Z.-L., & Niyogi, D. (2022). Improving the local climate zone classification with building height, imperviousness, and machine learning for urban models. *Computational Urban Science*, 2(1). doi: 10.1007/s43762-022-00046-x
- Hu, C., Tam, C., Li, X., Huang, K., Ren, C., **Fung, K. Y.**, & Wang, Z. (2023). Mega-city Development Impact on hourly extreme rainfall over the South China Greater Bay Area under near-future climate warming. *Urban Climate*, 48, 101389. doi:10.1016/j.uclim.2022.101389
- **Fung, K. Y.**, Tam, C.-Y., Lee, T. C., & Wang, Z. (2021). Comparing the Influence of Global Warming and Urban Anthropogenic Heat on Extreme Precipitation in Urbanized Pearl River Delta Area Based on Dynamical Downscaling. *Journal of Geophysical Research: Atmospheres*, 126(21). doi: 10.1029/2021JD035047
- Hu, C., **Fung, K. Y.**, Tam, C.-Y., & Wang, Z. (2021). Urbanization Impacts on Pearl River Delta Extreme Rainfall Sensitivity to Land Cover Change Versus Anthropogenic Heat. *Earth And Space Science*, 8(3). doi: 10.1029/2020ea001536

Research Experience

University of Miami | Cooperative Institute for Marine and Atmospheric Studies; Atlantic Oceanographic and Meteorological Laboratory | Hurricane Research Division

Florida, US
Sep 2023 – Now

Postdoctoral Associate

- Improving the Hurricane Analysis and Forecast System (HAFS) with the development of a scale-aware turbulent kinetic energy planetary boundary layer scheme

The University of Texas at Austin | Department of Geological Sciences

Texas, US
Sep 2018 – Apr 2023

Graduate Student Researcher in Zong-Liang Yang and Dev Niyogi groups

- Analyzing the performance of multiple machine learning algorithms and urban auxiliary datasets in generating Local Climate Zone (LCZ) maps
- Studying the performance of implementing the LCZ classification scheme into the Weather and Research Forecasting model (WRF) in different weather conditions
- Studying the impact of urban overheating mitigation strategies on social equity
- Investigating antecedent soil condition on Hurricane rainfall
- Investigating urbanization impacts on tornadoes

Purdue University | Department of Agronomy

Summer Visitor in Dev Niyogi group

Indiana, US
Jun 2019 – Aug 2019

- Generated LCZ map for Austin area using SAGA GIS
- Incorporated LCZ schemes into Noah and Noah-MP land surface model in WRF

The Chinese University of Hong Kong | Earth and Atmospheric Sciences

Master's Student in Chi Yung Francis Tam group

Hong Kong
Aug 2016 – Aug 2018

- Used urban-WRF to downscale a global circulation model (GFDL-ESM2M)
- Analyzed the mechanisms (e.g. 2m temperature, CAPE, circulation)
- Presented results in various international conferences (AGU, AOGS – EGU)

The Chinese University of Hong Kong | Earth System Science Programme

Undergraduate Researcher in Man Nin Chan group

Hong Kong
Sep 2015 – Jul 2016

- Improved a kinetic molecular model (KMGAP) by importing radical chemistry
- Captured realistic physical and chemical properties change of aerosols during heterogeneous OH oxidation

Hong Kong Observatory

Research Intern in Development Division

Hong Kong
Jun 2015 – Jul 2015

- Performed statistical analysis to investigate the relationship between different global meteorological conditions (geopotential height, temperature, NAO, etc.) with Hong Kong reservoirs' yield

Scholarships and Fellowships

2020 – 2023	Future Investigators in NASA Earth and Space Science and Technology (FINESST) fellowship
2021	Brundrett Memorial EPS Fellowship The University of Texas at Austin
2016	Chung Chi College Class Scholarship The Chinese University of Hong Kong
2014, 2017	Talent Development Scholarship The Government of the HKSAR

Awards and Achievements

2022	Second Place in American Meteorological Society Annual Meeting Oral Presentation
2021	Second Place in Student Research Symposium Oral Presentation The University of Texas at Austin
2020	Outstanding Teaching Assistant Award The University of Texas at Austin
2017	Outstanding Student Paper Award American Geophysical Union
2015, 2016	Dean's Honours List The Chinese University of Hong Kong

Teaching Experience

The University of Texas at Austin

Climate: Past, Present, Future

Texas, US
(Lead Teaching Assistant) Jan 2020 – May 2020
(Teaching Assistant) Jan 2019 – May 2019

- Coordinated among different teaching assistants
- Prepared teaching materials (PowerPoints, Experiments, and Assignments)

Physical Geology

(Teaching Assistant) Sep 2019 – Dec 2019

- Introduced different types of rocks and minerals, tectonics, and hydrology
- Hosted regular office hours to address students' questions

The Chinese University of Hong Kong

Tropical Meteorology

Hong Kong
(Teaching Assistant) Jan 2017 – May 2017

- This course was a co-teaching course for both graduate undergraduate students
- Introduced the phenomena and motions in the tropical troposphere (e.g. ITCZ, ENSO, MJO, cyclones, and monsoons)
- Introduced methods to examine tropical atmospheric phenomena (e.g. Hovmöller diagram)

Global Environmental Change

(Teaching Assistant) Sep 2016 – Dec 2016

- Introduced the science and mechanisms behind the global warming issue
- Discussed global warming skeptics with students
- Designed materials and introduced how to analyze atmospheric data using NCL

Service

The University of Texas at Austin

Water, Climate, and Energy seminar series

- Coordinate weekly seminars

Texas, US

(Coordinator) Sep 2022 – May 2023

Presentations

- “Utilizing Urban Overheating Mitigation Strategies to Reduce Urban Heat Stress and Improve Equity”, *Florida International University*, Jan 2024 (**Invited Seminar**)
- “Utilizing Urban Overheating Mitigation Strategies to Reduce Urban Heat Stress and Improve Equity”, *American Geophysical Union Fall Meeting*, San Francisco, CA, Dec 2023 (Oral)
- “Significance of using building height and imperviousness information in improving LCZ classification”, *International Association for Urban Climate Meeting* (virtual), Aug 2022 (Poster)
- “Importance of Urban Characterization in Capturing Urban Sprawl and Heterogeneity on Hurricane Harvey Precipitation”, *Asia Oceania Geosciences Society Annual Meeting* (virtual), Aug 2022 (Poster)
- “Advancing the Local Climate Zones Classification method in Austin for Understanding Urban Extreme Weather”, *Jackson School Student Research Symposium*, Mar 2022 (Poster)
- “Improved Houston Weather Simulation by Implementing the WUDAPT Local Climate Zone Urban Classification Scheme in WRF”, *American Meteorological Society Annual Meeting* (virtual), Jan 2022 (Oral) [**Awarded Second place in Conference on Climate Variability and Change Oral Presentation**]
- “Evaluating the Brown Ocean Effect Using Land Surface Model and Satellite-Based Soil Moisture Products during a Hurricane Event”, *American Meteorological Society Annual Meeting* (virtual), Jan 2022 (Poster)
- “Advancing the Local Climate Zones Classification method in Austin for Understanding Urban Extreme Weather”, *American Geophysical Union Fall Meeting* (hybrid), New Orleans, LA, Dec 2021 (Poster)
- “Testing different dataset and machine learning methods accuracy in producing the Austin Local Climate Zone”, *Jackson School Student Research Symposium*, Feb 2021 (Poster) [**Awarded Second place in Late Career Ph.D. session Poster Presentation**]
- “Impact of implementing the Local Climate Zone urban classification scheme in WRF on weather simulations in Houston”, *American Geophysical Union Fall Meeting* (virtual), Dec 2020 (Oral)
- “Using Landsat imageries to construct recent high-resolution urban land use land cover dataset for urban modeling”, *Jackson School Student Research Symposium*, Feb 2020 (Poster)
- “Comparing the urbanization and global warming impacts on extreme rainfall characteristics in Southern China Pearl River Delta megacity based on dynamical downscaling”, *Jackson School Student Research Symposium*, Feb 2019 (Poster)
- “Comparing the urbanization and global warming impacts on extreme rainfall characteristics in Southern China Pearl River Delta megacity based on dynamical downscaling”, *American Geophysical Union Fall Meeting*, Washington, DC, Dec 2018 (eLightning Poster, Invited)
- “Comparing the urbanization and global warming impacts on extreme rainfall characteristics in Southern China Pearl River Delta megacity based on dynamical downscaling”, *New Dimensions for Natural Hazards in Asia: An AOGS-EGY Joint Conference*, Tagaytay, Philippines, Feb 2018 (Poster)
- “Comparing the urbanization and global warming impacts on extreme rainfall characteristics in Southern China Pearl River Delta megacity based on dynamical downscaling”, *American Geophysical Union Fall Meeting*, New Orleans, LA, Dec 2017 (Poster) [**Awarded Outstanding Student Paper Award in Natural Hazard session**]
- “Comparing the urbanization and global warming impacts on extreme rainfall characteristics in Southern China PRD megacity based on dynamical downscaling”, *International Workshop on Tropical-subtropical Weather, Climate and Oceans*, Guangzhou, China, Nov 2017, (Oral, Substitute Invited)
- “The Effect of Urbanization on Extreme Precipitation in Pearl River Delta (PRD) Region: Downscaling GFDL-ESM2M by WRF”, *Workshop of Urban Meteorology*, Hong Kong, Jun 2017 (Oral)