Tsz-Kin Lai | Curriculum Vitae

Department of Atmospheric and Oceanic Sciences, McGill University
Room 945, Burnside Hall, 805 Sherbrooke Street West, Montreal, Quebec H3A 0B9, Canada
✉ eric.lai@mail.mcgill.ca • www.meteo.mcgill.ca/∼tklai

Research Interests

Tropical Cyclones, Mesoscale Convective Systems, Tropical Meteorology, Severe Weather, Cloud Dynamics

Education

McGill University — **Montreal, Canada**
PhD Candidate in Atmospheric and Oceanic Sciences — *2015–Present*

University of Reading — **Reading, UK**
MSc in Atmosphere, Ocean and Climate — *2013*

- Dissertation: *Emergence of Tropical Cyclones in Baroclinic Waves*
- Supervisors: Prof. John Methven and Dr. Rosalind J. Cornforth
- Graduated with Distinction

The Chinese University of Hong Kong — **Hong Kong**
B.Sc. in Physics with minor in Earth System Science — *2012*

- Bachelor Final Year Project: *Advanced Bias Removal Approach using a Kalman Filter for Probabilistic Wind Speed Forecasts During the Period of Tropical Cyclone Influence*
- Supervisors: Mr. Ping Cheung (Scientific Officer, Hong Kong Observatory) and Dr. Kam-Moon Pang

Research and Work Experience

Research

Research Application Laboratory (RAL), National Center for Atmospheric Research (NCAR) — **Boulder, USA**
Visiting Student — *Jul 2019–Oct 2019*

- Tropical Cyclone Inner Eyewall Decay in Numerical Experiments
- Host: Dr. Eric A. Hendricks

Department of Atmospheric and Oceanic Sciences, McGill University — **Montreal, Canada**
Graduate Research Assistant — *Sep 2015–Present*

- Tropical Cyclone Eyewall Replacement Cycle

Fugro GEOS Ltd. (now Fugro GB Marine Ltd.) — **South Oxfordshire, UK**
Meteorology Researcher — *Dec 2013–Jul 2015*

- Participated in meteorological research project on "Improving Forecasts of African Dust Storms" in collaboration with University of Leeds.
- Participated in research project on "Holistic Vessel Performance and Routing System" in collaborations with University of Southampton etc.
- Performed internal projects such as Nigeria lightning statistics and verification of wind speed forecast produced by WRF and GFS.

Department of Meteorology, University of Reading — **Reading, UK**
Voluntary Research Assistant — *Aug 2013–Aug 2015*

- Performed a research project about tropical cyclogenesis based on my masters dissertation.

Hong Kong Observatory — **Hong Kong**
Summer Intern Student — *Summer 2011*

- Worked on "Improving the very short range convective weather forecast for the Hong Kong Flight Information Region (HKFIR)"
- Developed an improved forecasting approach based on ECMWF model

Institute of Space and Earth Information Science, The Chinese University of Hong Kong — **Hong Kong**
Student Research Assistant — *Summer 2010*

- Studied the influence of ENSO on the weather in Hong Kong

Teaching and Technical

Department of Atmospheric and Oceanic Sciences, McGill University — **Montreal, Canada**
Teaching Assistant — *Sep 2016–Present*

- ATOC214 Introduction: Physics of the Atmosphere (Fall 2016, Fall 2018)
- ATOC184 Science of Storms (Winter 2017, Winter 2018, Winter 2019, Winter 2020)
- ATOC181 Introduction to Atmospheric Science (Fall 2017)

Department of Applied Physics, The Hong Kong Polytechnic University — **Hong Kong**
Technical Helper for Community Weather Information Network (Co-WIN) — *Summer 2009*

- Monitored, maintained and upgraded the automatic weather stations of Co-WIN;
- Processed data-testing and apparatus calibration.

Selected Honours and Awards

2019: **Graduate Mobility Award,** *McGill University,* Canada

2017–2019: **Graduate Research Enhancement and Travel (GREAT) Award,** *McGill University,* Canada

2015–2018: **Graduate Excellence Fellowship,** *McGill University,* Canada

2015–2016: **Atmospheric and Oceanic Sciences Graduate Award,** *McGill University,* Canada

2012: **International Masters Bursary,** *University of Reading,* UK

2011: **Individual Second Prize and Team Champion,** *The 12th Challenge Cup – National Competition in Science and Technology for University Students,* China

2011: **Hong Kong Observatory Scholarship,** *Hong Kong Observatory,* Hong Kong

2011: **Second Runner-up in Undergraduate Individual Entry,** *Professor Sir Charles K. Kao Student Creativity Awards 2011, The Chinese University of Hong Kong,* Hong Kong

Peer-reviewed Publications

- **Lai, T.-K.,** K. Menelaou, and M. K. Yau, 2019: Barotropic instability across the moat and inner eyewall dissipation: A numerical study of Hurricane Wilma (2005). *J. Atmos. Sci.,* **76,** 989–1013, doi:10.1175/JAS-D-18-0191.1.
- Menelaou, K., M. K. Yau, and **T.-K. Lai**, 2018: A possible three-dimensional mechanism for oscillating wobbles in tropical cyclone-like vortices with concentric eyewalls. *J. Atmos. Sci.,* **75,** 2157–2174, doi:10.1175/JAS-D-18-0005.1.

Presentations

- **Lai, T.-K.**, E. A. Hendricks, K. Menelaou, and M. K. Yau, 2019: Barotropic Instability across the Moat and Inner Eyewall Decay: Numerical Experiments. *AGU Fall Meeting 2019,* San Francisco, CA, USA. (oral)
- **Lai, T.-K.**, E. A. Hendricks, K. Menelaou, and M. K. Yau, 2019: Barotropic Instability across the Moat and Inner Eyewall Dissipation: A Real Case Simulation and Numerical Experiments. *NCAR MMM Dynamics Happy Hour Seminar Series,* Boulder, CO, USA. (invited talk)
- **Lai, T.-K.**, K. Menelaou, and M. K. Yau, 2019: Barotropic Instability across the Moat and Inner Eyewall Dissipation: A Real Case Simulation and An Idealised Experiment. *9th Northeast Tropical Workshop,* Dedham, MA, USA. (oral)
- **Lai, T.-K.**, K. Menelaou, and M. K. Yau, 2018: Barotropic Instability across the Moat and Inner Eyewall Dissipation: A Numerical Study of Hurricane Wilma (2005). *AGU Fall Meeting 2018,* Washington, DC, USA. (oral)
- **Lai, T.-K.**, K. Menelaou, and M. K. Yau, 2018: A Dynamical Perspective on Inner Eyewall Dissipation in Hurricane Wilma (2005). *AMS 33rd Conference on Hurricanes and Tropical Meteorology,* Ponte Vedra, FL, USA. (poster)
- **Lai, T.-K.**, and M. K. Yau, 2017: Emergence of PV Skirts in TC-like Vortices. *8th Northeast Tropical Meteorology Conference,* Rensselaerville, NY, USA. (poster)

Professional Affiliations

Member: *American Meteorological Society,* USA

Student Member: *American Geophysical Union,* USA

Other Professional Experience

The Meteorological Society, The Student Union of the Chinese University of Hong Kong — **Hong Kong**
Founder and former President (2010–2011)

Languages

Cantonese: Native

Mandarin: Native
English: Fluent

Computer Skills

Operating Systems: Unix, Linux, Windows, Mac OS
Programming: Python, Fortran, Perl (basic), C++ (basic)
Computing: MATLAB, Mathematica, R (basic)
Visualization: GrADS, IDL, NCL (basic)
Scripting: PHP, JavaScript, PowerShell (basic)
Typography: LaTeX
Miscellaneous: MySQL, MS Office, HTML, CSS