

FUNG, Ka Ming

Department of Civil and Environmental Engineering, Massachusetts Institute of Technology

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EDUCATION BACKGROUND

The Chinese University of Hong Kong (CUHK)

Doctor of Philosophy in Earth and Atmospheric Sciences

Aug 2015 – Aug 2019

- *Thesis Title:* Modeling and Assessing the Impacts of Sustainable Agricultural Practices on Air Quality and Climate
- *Advisor:* Amos Pui Kuen Tai

Master of Science in Mathematics (*Final GPA:* 3.688/4)

Sep 2011 – Jun 2012

Hong Kong University of Science and Technology (HKUST)

Bachelor of Engineering in Mechanical Engineering (Second Class Honor, Division I)

Sep 2006 – Jun 2009

RESEARCH EXPERIENCE

Postdoctoral Associate, Department of Civil and Environmental Engineering,
Massachusetts Institute of Technology

Sep 2019 – Present

Supervised by: Colette Heald

- investigates how marine dimethyl sulfide (DMS) oxidation affects atmospheric aerosol formation and climate using the Community Earth System Model (CESM)

Visiting Researcher, Leverhulme Centre for Climate Change Mitigation, Department
of Animal and Plant Sciences, The University of Sheffield

Mar – May 2019

Hosted by: Maria Val Martin

Sponsored by: Global Scholarship Programme for Research Excellence, CUHK

- developed a new scheme to quantify the canopy capture of ammonia emitted from vegetated land and croplands in the Community Land Model (CLM)
- validated simulated ammonia against various datasets of satellite & in-situ observations and emission inventories

Visiting Scholar, Department of Environmental Sciences, Emory University

Oct 2017 – Mar 2018

Hosted by: Eri Saikawa

Sponsored by: Pre-doctoral Fellowship, Emory University

- implemented into CLM novel parameterizations of belowground crop-crop competition and soil ammonia volatilization
- assisted in soil sample collection and heavy metal measurement for a feasibility assessment of urban farming in Atlanta, Georgia, USA

Junior Research Assistant, Earth System Science Programme, CUHK

Apr – Jul 2015

- studied global impacts of agricultural activities using a biogeochemical model DeNitrification-DeComposition (DNDC), a 3-D global chemical transport model (GEOS-Chem), and CESM
- conducted data analysis on agricultural nitrogen emissions, crop production, and soil biogeochemical processes using R

Junior Research Assistant, Department of Imaging and Interventional Radiology,
CUHK

Mar 2013 – Mar 2015

- published a paper in *Scientific Reports* (*DOI:* 10.1038/srep14140)
- prepared proposals, gave presentations to the selection committees, and obtained a total of HKD3.2M research grants from the Innovation and Technology Fund (*Project Ref.:* ITS/149/14FP and ITS/293/14FP)
- built tools for mathematical and statistical analyses on four-dimensional medical images using MATLAB
- coordinated a study concerning the influence of education background on brain activities of science/medicine students, including recruiting 40 university freshmen, scheduling for brain scans, and performing on-campus cognitive tests

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PUBLICATIONS

Journal articles:

1. **K. M. Fung**, A. P. K. Tai, T. Yong, X. Liu & H.-M. Lam (2019) **Co-benefits of intercropping as a sustainable farming method for safeguarding both food security and air quality**, *Environmental Research Letters* (DOI: 10.1088/1748-9326/aafc8b)
2. D. Wang, F. Zhu, **K. M. Fung**, W. Zhu, Y. Luo, W. C. W. Chu, V. C. T. Mok, J. Wu, L. Shi, A. T. Ahuja & Y. Mao (2015) **Predicting Cerebral Hyperperfusion Syndrome Following Superficial Temporal Artery to Middle Cerebral Artery Bypass based on Intraoperative Perfusion-Weighted Magnetic Resonance Imaging**, *Scientific Reports* (DOI: 10.1038/srep14140)

PRESENTATIONS

Invited Talks:

1. **Modelling and Assessing the Impacts of Intercropping, as a Sustainable Farming Practice, on Food Security, Air Quality, and Public Health**, *Centre for Atmospheric Science Seminars*, Department of Chemistry, University of Cambridge, Cambridge, UK (10 May 2019)

Conference Talks:

1. **Impacts of Ammonia-Aerosol-Climate Feedbacks on Food Security and Air Quality**, *Community Earth System Model Land Model Working Group Meeting 2020*, Boulder, Colorado, USA (4 Mar 2020)
2. **Modeling ammonia-aerosol-climate feedback mechanisms using an earth system model: Implications for future food security and air quality**, *American Geophysical Union (AGU) Fall Meeting 2019*, San Francisco, California, USA (11 Dec 2019)
3. **Modeling and Assessing the Impacts of Sustainable Farming Practices on Food Security, Air Quality, and Public Health**, *The Chemistry Climate Model Initiative (CCMI) Science Workshop*, Hong Kong (9 Aug 2019)
4. **Improving the terrestrial N cycle modeling for a better estimation of agricultural ammonia emission under sustainable farming alternatives**, *AGU Fall Meeting 2018*, Washington DC, USA (10 Dec 2018)
5. **Large-scale adoption of intercropping for securing global food supply and air quality – a model study using CLM 4.5**, *Community Earth System Model Land Model Working Group Meeting 2018*, Boulder, Colorado, USA (5 Feb 2018)
6. **Modeling large-scale adoption of intercropping as a sustainable agricultural practice for food security and air pollution mitigation around the globe**, *AGU Fall Meeting 2017*, New Orleans, Louisiana, USA (15 Dec 2017)
7. **Modeling and assessing effectiveness of intercropping as a sustainable agricultural practice for food security and air pollution mitigation**, *5th Integrated Land Ecosystem-Atmosphere Processes Study (iLEAPS) Science Conference*, University of Oxford, Oxford, UK (11 Sep 2017)

Conference Posters:

1. **Co-benefits of Intercropping, as a Sustainable Farming Practice, for Safeguarding Food Supply and Air Quality**, *Gordon Research Conference – Urbanization, Water and Food Security*, HKUST, Hong Kong (22 Jul 2019)
2. **Estimation of agricultural ammonia emission under sustainable farming practices by improving terrestrial nitrogen cycle modeling**, *7th Annual Composition-Climate Interaction Meeting*, Exeter, UK (20 Mar 2019)
3. **Co-benefits of maize-soybean intercropping for securing air quality and global food supply**, *Global Young Scientists Summit 2019*, Singapore (23 Jan 2019)

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4. **Potential co-benefits of intercropping as a sustainable agricultural practice for both air pollution mitigation and global food security**, *Joint 14th iCACGP Symposium and 15th IGAC Science Conference*, Takamatsu, Japan (27 Sep 2018)
5. **Evaluating effectiveness of maize-soybean intercropping in securing food production and air quality in China using DNDC and GEOS-Chem**, *The 8th International GEOS-Chem Meeting*, Harvard University, Massachusetts, USA (3 May 2017)
6. **Effectiveness of intercropping with soybean as a sustainable farming practice to maintain food production and reduce air pollution in China**, *AGU Fall Meeting 2016*, San Francisco, California, USA (12 Dec 2016)

TEACHING EXPERIENCE

Guest Lecturer, Graduate Division of Earth and Atmospheric Sciences, CUHK

- EASC5001 Research Frontiers in Earth & Atmospheric Sciences I (a special lecture on nitrogen cycle modeling) *Fall 2018*

Mentor, Earth System Science Programme, CUHK

- ESSC4820 Senior Project II *Spring 2017*
- ESSC4810 Senior Project I *Fall 2016*

Teaching Assistant, Earth System Science Programme, CUHK

- ESSC4520 Numerical Methods and Modeling for Earth and Atmospheric Sciences *Spring 2016*
- ESSC2020 Climate System Dynamics *Fall 2015*

AWARDS & HONORS

Travel Support for *Community Earth System Model Land Model Working Group Meeting 2020*, National Centre for Atmospheric Research *2020*

Li Po Chun Charitable Trust Fund Postgraduate Scholarship *2019*

Travel Support, *7th Annual Composition-Climate Interaction Meeting*, National Centre for Atmospheric Science, University of Leeds *2019*

Global Scholarship Programme for Research Excellence, Office of Academic Links, CUHK *2019*

Selected Attendee, *Global Young Scientists Summit 2019*, Singapore Government *2019*

Travel Grant and Selected Attendee of the Early Career Short Course, *Joint 14th iCACGP Symposium & 15th IGAC Science Conference*, IGAC Project *2018*

Pre-doctoral Fellowship, Institute for Quantitative Theory and Methods, Emory University *2017*

Reaching Out Award, HKSAR Government *2017*

Winner of The Young Scholar Competition, *WUN Symposium cum Research Summit – Impacts of Grain Legume Research and Development in Developing Countries*, CUHK *2017*

Service Award, Earth System Science Programme, CUHK *2015/16 & 2016/17*

OTHER WORK EXPERIENCE

Mathematics Teacher, NTK Academic Group *Oct 2012 – Mar 2013*

- specialized in mathematics of IB, GCE, I/GCSE curricula at various levels
- wrote study guides & exercise books

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Management Trainee, The Jardine Engineering Corporation, Limited

Jul 2009 – May 2011

- managed air pollution control projects on building crematoria with flue gas treatment facilities
- participated in tender bidding processes which won a contract worth >HKD100M (Ref.: SST326, Architectural Services Department, HKSAR Government)
- developed automatic data analysis programs of government contracts awarded by local companies using VBA for Excel

INTERNSHIP

Co-op Student Trainee, The Jardine Engineering Corporation, Limited

Feb – Jun 2009

- engaged in projects related to supplying, building, and operating facilities for material handling, waste management, & air pollution treatment

PROFESSIONAL ACTIVITIES

Conference/Workshop Organizing Committee

- *CCMI Summer School & Science Workshop*, IGAC *2019*
- *Early Career Scientist Workshop, 5th iLEAPS Science Conference* *2017*
- *Workshop on Modeling Land-Atmosphere Interactions: Fire, Agricultural and Canopy Processes*, CUHK *2017*

Journal Referee

- *Journal of Geophysical Research: Biogeosciences* *2020*
- *Environmental Research Letters* *2019 – 2020*
- *Environmental Research Communications* *2019*

Student Volunteer, AGU Fall Meetings

2018 & 2019

Regional Head (SE Asia & Pacific), Early Career Scientist Regional Network, iLEAPS

2018 – 2019

COMMUNITY SERVICE

Resident Tutor & Honorary Resident Tutor, Daisy Li Hall, New Asia College, CUHK

2013 – 2019

Councilor, HKUST Students' Union (SU) Council

2008 – 2009

Student Ambassador, School of Engineering, HKUST

2008 – 2009

Publication Secretary, Glacier, HOUSE III Students' Association, HKUSTSU

2007

LANGUAGES

Chinese fluent written, native Cantonese and conversational Mandarin

English fluent spoken and written, attended IELTS in 2008 with an overall score of 7.0

COMPUTER SKILLS

Scientific Modeling CESM, CAM-chem, CLM, DNDC, GEOS-Chem, WRF

Programming C++, Fortran, MATLAB, Python, R, VBA for Excel

Graphical Drawing Adobe Illustrator, Photoshop

Technical Drawing Autodesk 3ds Max, AutoCAD, SolidWorks