# Yi-Ling HWONG 方奕羚

www.yiling-hwong.com

## SUMMARY

Postdoctoral researcher in atmospheric (climate) science specialising in convective process modelling. Completed a PhD in machine learning and science communication. Currently an EU Marie Curie Fellow. Previously worked as a big data engineer for the CMS detector of the Large Hadron Collider experiment at CERN. Fluent in five languages, including English, Mandarin and German. Avid reader, science communicator and musician. Extensive international experience and passionate about environmental and social justice causes.

## EDUCATION

Aug 2015 – Oct 2018 **Doctor of Philosophy (PhD)**
*University of New South Wales (UNSW), Australia*
Develop machine learning techniques to analyse social media big data to examine the impact of space and climate science communication

Mar 2004 – Aug 2008 **Master of Engineering (M.Eng) in Power Engineering**
*University of Applied Sciences Karlsruhe, Germany*
Graduated 2nd in cohort. Thesis: Development of the control system for a liquid helium production plant for the Large Hadron Collider experiment

## PROFESSIONAL EXPERIENCE

Apr 2022 – current **Postdoctoral Research Fellow (IST-BRIDGE / Marie Curie Fellow)**
*Institute of Science and Technology Austria (ISTA), Klosterneuburg, Austria*
Study convective processes using high resolution models (SAM and WRF) and the impact of convective organisation on climate change and extreme precipitation

Nov 2018 – Feb 2022 **Postdoctoral Research Associate**
*Climate Change Research Centre, UNSW, Sydney, Australia*
Study convective parameterisation in atmospheric models, design numerical methods in the WRF model to analyse convective schemes.

Aug 2015 – Oct 2018 **PhD Researcher**
*UNSW, Sydney, Australia*
Develop machine learning methods to study processes & outcomes of social media space and climate science communication. Supervised & unsupervised learning.

Jul 2017 – Feb 2018 **Research Assistant**
*Project Artificial General Intelligence (AGI), Sydney, Australia*
Research techniques in the development of artificial general intelligence, including reinforcement learning, Spike-Timing Dependent Plasticity, etc.

Aug 2014 – May 2015 **Communication Officer**
*Evolve Housing (non-profit), Sydney, Australia*
Manage and implement organisation digital communication strategy.

Jun 2012 – Apr 2014 **Digital Communication Officer**
*Doctors without Borders, Geneva, Switzerland*
Manage organisation website migration and redesign project (website visitors increased by over 60% after relaunch).

Dec 2008 – May 2012 **Data Acquisition Engineer**
*European Org. for Nuclear Research (CERN), Geneva, Switzerland*
Develop analysis toolkit of Finite State Machines for the Compact Muon Solenoid (CMS) detector of the LHC accelerator.

## AWARDS & GRANTS (SELECTED)

Apr 2022 Recipient of the Marie Curie COFUND Fellowship

Jun 2018 Winner of 3-minute thesis competition at UNSW School of Biological, Earth, and Environmental Sciences

Jan 2017, 2018 Winner of Outstanding Student Paper Award (OSPA), American Geophysical Union (AGU) Fall Meeting

Dec 2017 National finalist, Campus Travel & Virgin Australia STEM Travel Grant

Jun 2017 Winner of the Palaeontology, Geobiology and Earth Archives (PANGEA) Research Centre Outstanding Postgraduate Research Presentation Award

2009 – 2011 Recipient of the Marie Curie Fellowship under the 7th Framework Programme

2004 – 2008 Recipient of the Malaysian Public Service (JPA) Scholarship, awarded to the top 1% of the country's high school graduates

## TEACHING & SUPERVISION

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| Apr 2020 – Feb 2022 | **Co-supervision of student in Honours Project**<br>*University of New South Wales (UNSW), Sydney, Australia*<br>Project: Investigation of convective processes using advanced numerical and machine learning methods |
| Jan 2016 – Feb 2018 | **Educator**<br>*Thinkspace at the Powerhouse Museum, Sydney, Australia*<br>Teach programming (Python, C#), game design (Unity, Minecraft) & physical computing (Arduino, Raspberry Pi) to students between the ages of 7 & 12 |
| Jul 2015 – Oct 2015 | **Teaching assistant**<br>*UNSW, Sydney, Australia*<br>Moderate discussions, mark assignments, provide feedback and guide students in the Introduction to Astronomy course (School of Physics) |
| Feb 2011 | **Lab designer, tutor and instructor**<br>*The 2nd International School of Trigger and Data Acquisition, Rome, Italy*<br>Conceptualise and design lab exercises in trigger and data acquisition methods in accelerator physics, lab instructor for M.Sc and PhD students |
| Feb 2010 | **Tutor and lab instructor**<br>*The 1st International School of Trigger and Data Acquisition, Ankara, Turkey*<br>Teach M.Sc and PhD students the basics of trigger and data acquisition in high energy physics and guide them in lab exercises |

## LANGUAGES & SKILLS

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| Languages | Mandarin (mother tongue), English, German, Malay, French (basic user), Cantonese and Hokkien |
| Programming languages | Python, Fortran, R, C, C#, HTML, CSS |
| Atmospheric models | WRF, SAM, NCAR Global Model Testbed |
| Data science | scikit-learn, Weka, MatLab |
| Database & version control | MySQL, MongoDB, Git |
| Operating systems | Linux, Mac OS, Windows |
| Others | Piano (Performer's Certificate in solo piano from the Trinity College London), viola |

## SPEAKING & OUTREACH (SELECTED)

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| Sep 2021 | Moderator for "Climate Messaging" session at the Global Climate Festival |
| Apr 2021 | Invited seminar at Uni. of California Davis on Convective Parameterization |
| Jun 2020 | WRF model representative at the International e-workshop on Standards for SCM / LES Comparisons |
| Sep 2019 | Presenter at the Australian Research Council (ARC) Centre of Excellence for Climate Extremes (CLEX) annual workshop on extreme rainfall |
| Apr 2019 | Public talk "How Do We Begin to Understand the Origins of the Universe?", given at the Woollhara Library, Australia |
| Dec 2018 | Co-convener at AGU Fall Meeting session on "Communicating science – Practice, Research and Reflection" |
| Dec 2017 | Invited speaker at the AGU Fall Meeting (New Orleans, USA) |
| Aug 2016 | Invited speaker at the Sydney Science Festival, speaking about the LHC project |
| Jul 2012 | Panel speaker at the Partnership Symposium on EU-ASEAN Science, Technology & Innovation Cooperation, ESOF convention (Dublin, Ireland) |
| Sep 2011 | Invited speaker for the session "Mobility of Researchers in Europe: An Endeavour for All" at the European Association for International Education conference (Copenhagen, Denmark) |

## VOLUNTEERING (SELECTED)

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| Apr 2022 – current | Representative, Postdoc Association (PDA) at ISTA |
| Feb 2019 – Feb 2022 | Mentor, City East Mentor Program for Refugees & Migrants (Sydney, Australia) |
| Aug 2019 – Feb 2022 | Representative for early career researchers, CCRC at UNSW (Sydney, Australia) |
| Jul 2017 – Jul 2018 | President, Community Speaker Toastmaster Club (Sydney, Australia) |
| Jul 2016 – Jul 2017 | VP of Education, Community Speaker Toastmaster Club |
| Jul 2015 – Jul 2016 | VP of Membership, Community Speaker Toastmaster Club |
| Jan 2015 – Dec 2016 | Editor in Chief, Scientific Malaysian magazine |
| 2009 – 2010 | Editor, UN RESPECT Refugee e-zine (nominated for UN Volunteering Award) |

## PUBLICATIONS (CLIMATE SCIENCE)

*First author publications*

**Hwong, Y. L.,** Sherwood, S. C., Fuchs, D. (2022). Can We Use 1D Models to Predict 3D Model Response to Forcing in an Idealized Framework? *Journal of Advances in Modeling Earth Systems*, 14(4), e2021MS002785.

**Hwong, Y.L.,** Song, S., Sherwood, S. C., Stirling, A., Rio, C., Roehrig, R., ... & Touzé-Peiffer, L. (2021). Characterizing Convection Schemes Using Their Responses to Imposed Tendency Perturbations. *Journal of Advances in Modeling Earth Systems*, 13(5), e2021MS002461.

*Selected refereed conference proceedings and abstracts*

Colin, M., **Hwong, Y. L.,** Nie, J., Wu, C. M., Dixit, V. (2022, Aug). Co-convener for accepted session proposal (Idealised Frameworks, Modelling, and Observations to Understand Moist Convective Processes at Various Scales). *19th Annual Meeting Asia Oceania Geosciences Society (AOGS).*

**Hwong, Y. L.,** Sherwood, S. C., Fuchs, D. (2022, May). Can We Use Single-Column Models to Predict 3D Model Response to Forcing in an Idealized Radiative-Convective Equilibrium Framework? *35th Conference on Hurricanes and Tropical Meteorology.* Abstract accepted for oral presentation.

**Hwong, Y. L.,** Sherwood, S. C., Fuchs, D. (2021, Dec). Comparing the Physics of 1D vs. 3D Atmospheric Models Using Their Linearised Responses. *24th International Congress on Modelling and Simulation (MODSIM2021).* Extended abstract accepted for oral presentation.

**Hwong, Y. L.,** Sherwood, S. C., Fuchs, D. (2021, Dec). Can We Use 1D Models to Predict 3D Physics? *AGU Fall Meeting.* Abstract accepted for poster presentation.

Raupach, T., **Hwong, Y. L.,** Sherwood, S. C. (2021, Dec). Simulated convection responses to temperature and moisture perturbations in large eddy simulations. *24th International Congress on Modelling and Simulation (MODSIM2021).* Extended abstract accepted for oral presentation.

**Hwong, Y. L**., Song, S., Sherwood, S. C., Stirling, A., Rio, C., Roehrig, R., ... & Touzé-Peiffer, L. (2021, Apr). Characterising Convection Schemes Using Their Linearised Responses to Convective Tendency Perturbations. *Improvement and calibration of clouds in models (virtual).* Oral presentation.

Colin, M., Sherwood, S. C., **Hwong, Y. L.** (2021, Mar). Comparing convective memory in different schemes with imposed fixed large-scale state. *Atmospheric Modelling virtual workshop.* Oral presentation.

**Hwong, Y. L.,** Sherwood, S. C., Song, S. (2019, Jul). Using WRF Single-Column Model as a Testbed for Convective Parameterisation. *Convection Parametrization: Progress and Challenges workshop*, MetOffice, UK. Poster presentation.

Sherwood, S. C., **Hwong, Y. L.,** Song, S., Stirling, A., Rio, C., Roehrig, R., ... & Daleu, C. (2019, Dec). Characterizing Convective Schemes by Their Linearized Responses. In *AGU Fall Meeting Abstracts* (Vol. 2019, pp. A31L-2773).

Sherwood, S. C., Colin, M., **Hwong, Y. L.,** Song, S., & Fuchs, D. (2019, Dec). Exploring convective memory and quasi-equilibrium. In *AGU Fall Meeting Abstracts* (Vol. 2019, pp. A31L-2772).

## PUBLICATIONS (SCI. COMM & PARTICLE PHYSICS)

*First author publications*

**Hwong, Y. L.** (2018). Communicating space science on social media: A study of engagement and trust in science. *Doctoral dissertation*, Faculty of Science, University of New South Wales.

**Hwong, Y. L.,** Oliver, C., Van Kranendonk, M., Sammut, C., & Seroussi, Y. (2017). What makes you tick? The psychology of social media engagement in space science communication. *Computers in Human Behavior*, *68*, 480-492.

**Hwong, Y. L.,** Keiren, J. J., Kusters, V. J., Leemans, S., & Willemse, T. A. (2013). Formalising and analysing the control software of the compact muon solenoid experiment at the large hadron collider. *Science of Computer Programming*, *78*(12), 2435-2452.

*Selected refereed conference proceedings and abstracts*

**Hwong, Y. L.,** Oliver, C. (2018, Nov). How Should We Communicate Science on Social Media? A Machine Learning Approach to Science Communication Research. *Australian Science Communicators Tenth National Conference*. Sydney, Australia. Oral presentation.

**Hwong, Y. L.,** Oliver, C., Van Kranendonk, M. (2018, Jun). In Science We Trust: Does Social Media Engagement with Scientists Improve Public Trust in Science? *Astrobiology Australasia Meeting*. Rotorua, New Zealand. Oral presentation.

**Hwong, Y. L.,** Oliver, C., & Van Kranendonk, M. J. (2017, Dec). To Trust or Not to Trust? What Drives Public Trust in Science in Social Media Engagement. In *AGU Fall Meeting Abstracts* (Vol. 2017, pp. U13B-39).

**Hwong, Y. L.,** Kusters, V. J., & Willemse, T. A. (2011). Analysing the control software of the compact muon solenoid experiment at the large hadron collider. In *International Conference on Fundamentals of Software Engineering* (pp. 174-189). Springer, Berlin, Heidelberg.