Curriculum Vitae

KOH Tieh Yong

Weather and Climate Scientist, Theoretical Physicist,
Sustainability Science Educator, Environmental Science Consultant

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Education Qualifications

PhD (Atmospheric Science), Massachusetts Institute of Technology, 2001
MASt (Mathematics: Theoretical Physics), University of Cambridge, 2024
BSc Hons I (Physics), Imperial College London, 1994

Academic and Professional Experience

2024 – present	Associate Professor (part-time), School of Science and Technology, Singapore University of Social Sciences
2021 – 2023	Associate Professor, School of Science and Technology, Singapore University of Social Sciences
2017 – 2021	Associate Professor, Centre for University Core, College of Lifelong and Experiential Learning, Singapore University of Social Sciences (*renamed from SIM University)
2016 – 2017	Associate Professor, UniSIM College, SIM University
2015 – 2016	Associate Professor (with tenure), Asian School of the Environment, Nanyang Technological University (NTU)
2013 – 2015	Associate Professor (with tenure), School of Physical & Mathematical Sciences, NTU
2009 – 2016	Principal Investigator, Earth Observatory of Singapore, NTU
2008 – 2017	Co-Investigator, Center for Environmental Sensing and Modeling (CENSAM), Singapore-MIT Alliance for Research and Technology (SMART)
2005 – 2014	Principal Investigator, Temasek Laboratories, NTU
2004 – 2013	Assistant Professor, School of Physical & Mathematical Sciences, NTU
2001 – 2004	Research Scientist (A), Temasek Laboratories, National University of Singapore (NUS)
2001	Visiting Scientist, Laboratoire de Météorologie Dynamique (LMD), Ecole Polytechnique

Consultancy Experience

2022 - 2023	Consultant, Weather Incident Investigation, Pan-United Concrete Pte Ltd, Singapore
2021	Instructor, Training Course on Climate for Secondary and Pre-university Geography Teachers, Academy of Singapore Teachers, Ministry of Education, Singapore
2020	Consultant and Contributor, "ASEAN State of Climate Change Report", Institute of Global Environmental Strategies, Bangkok, Thailand / Centre for International Law, National University of Singapore, Singapore (commissioned by ASEAN Working Group on Climate Change)
2014 – 2015	Project Consultant, "Development of Weather Database in Singapore for Atmospheric Dispersion Modelling", DSO National Laboratories, Singapore
2012	Project Consultant, "Sensitivity of Dispersion Modelling Results to Perturbations in Wind Magnitude", DSO National Laboratories, Singapore

Awards and Honours

2013	Nanyang Education Award, Nanyang Technological University
2012	Koh Boon Hwee Scholars Award, Nanyang Technological University (honoured by student Ng Huei Ying Nelly)
2011	Koh Boon Hwee Scholars Award, Nanyang Technological University (honoured twice, independently by students Wang Shengtao and Chiang Qi Ming Aron)
1996 – 1999	Jule Charney Prize, Massachusetts Institute of Technology
1994	Granville Prize, University of London
1994	Governors' Prize, Imperial College London

Selection of Courses Taught

2024	Linear Algebra
2023	Multivariate Calculus
2022	Mathematical Methods II: Laplace & Fourier Transforms, Linear 2nd Order ODE/PDE
2022	Mathematical Methods I: Linear Algebra & Linear 1st Order ODE
2022	Enterprise Leadership for Transformation 03, Session 10 - Sustainable Energy and Carbon Mitigation Policies
2021	Executive Management Programme 06, Session 10 - Why Do Good: Sustainable Development
2019 – 2021	Science for Sustainability
2017 – 2018	Sustainability and Technology
2014 – 2016	Climate and Climate Change
2008 – 2010	Atmospheric Physics
2007	Statistical Mechanics
2006 – 2013	Classical Mechanics
2005	Complex Methods for the Sciences
2005	Calculus for the Sciences I

Selected Professional Activities (Scientific Profession)

2024 – 2025	Member, International Scientific Committee, 8th WMO International Workshop on Monsoons (IWM-8).
2024 – present	Registered in List of Neutrals at World Intellectual Property Organization.
2023 – present	Registered in List of Experts at Intellectual Property Office of Singapore
2022 – present	Provisional Member, Asia Pacific Institute of Experts
2022 – present	Co-chair (2016 – 2022: Member), Working Group on Asian-Australian Monsoon, CLIVAR/GEWEX Monsoons Panel, World Climate Research Programme, World Meteorological Organisation
2022	Invited Participant, "Geopolitics and Domestic Policy Implications of Climate Change", Inaugural LKYSPP Strategic Roundtable with Prime Minister's Office Strategy Group and National Climate Change Secretariat, Lee Kuan Yew School of Public Policy (LKYSPP), National University of Singapore, Singapore
2022	Accredited Participant, Asia Pacific Institute of Experts Membership Accreditation Course 2022, Singapore
2022	Invited Speaker, 18th ASEAN Climate Outlook Forum, Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)
2021	Invited Panellist, Conversations on "UN Sustainable Development Goals" and "Climate Change (UN IPCC A6R)", 18th Annual Meeting, Asia-Oceania Geosciences Society, Singapore
2021	Invited Speaker, "Weather Prediction by Numerical Methods Module 2" Workshop, Meteorological Service Singapore and ASEAN Specialised Meteorological Centre
2021	Invited Speaker, Third Workshop on ASEAN Regional Climate Data, Analysis and Projections, Meteorological Service Singapore and ASEAN Specialised Meteorological Centre
2021 - 2023	Lead Coordinator, Sustainability Cluster @ SUSS, Singapore University of Social Sciences
2017 – 2020	Member, Stratospheric and Tropospheric Influences on Tropical Convective Systems, Stratosphere-Troposphere Processes and their Role in Climate, World Climate Research Programme, World Meteorological Organisation
2016 – 2024	Editor, Scientific Online Letters on the Atmosphere, Meteorological Society of Japan
2015	Invited Speaker, International Student Energy Summit
2014 – 2023	Member, Madden-Jullian Oscillation Task Force, Working Group on Numerical Experimentation, World Meteorological Organisation
2013	Expert Reviewer, 5th Assessment Report, Working Group 1, Inter-governmental Panel for Climate Change
2012	Member, Climate Science Experts Network, Meteorological Service Singapore
2012	Reviewer, White Paper for Competitive Research Programme (CRP) 10th Call-for-Proposals, National Research Foundation, Singapore

2012	Editor, Advances in Geosciences, Vol. 28 - Atmospheric Science and Ocean Science
2011	Editor, Advances in Geosciences, Vol. 22 - Atmospheric Science
2010 – 2022	Secretary, Atmospheric Sciences Section, Asia-Oceania Geosciences Society
2010	Contributor, WWRP/WGNE Joint Working Group on Forecast Verification Research, WWRP-WCRP, World Meteorological Organization
2004	Conference Publication Chair, 2nd Annual Meeting, Asia-Oceania Geosciences Society
2004 – 2023	Member, Asia-Oceania Geosciences Society
2002	Reviewer, Atmospheric Sciences Research Grant, Natural Environment Research Council, United Kingdom

Selected Professional Activities (Education and Outreach)

2022	Organiser and Lecturer, Online Workshop on Atmospheric Dynamics, College of Science, Nanyang Technological University, Singapore
2021	Invited Expert, “Inter-varsity Singapore Green Plan 2030 Youth Conversation”, National Youth Council, Singapore
2021	Invited Panelist, “Perspectives on Opportunities for Geography Students in Universities”, 2021 Geography Symposium, Singapore
2020	Member, Academic Audit Committee, Singapore University of Social Sciences
2020	Member, Syllabus Development Committee for Pre-University Geography, Ministry of Education, Singapore
2019	Member, Curriculum Review Committee for Pre-University Geography, Ministry of Education, Singapore
2015	Invited Panelist, Earth Day Film Screening "Chasing Ice", organized by Asian Venture Philanthropy Network
2014 – 2016	Member, NTU Teaching Council, Nanyang Technological University
2014	Examiner, Asian Physics Olympiad
2013 – 2014	Member, Advisory Committee, Climate Change Exhibition II, Singapore Science Centre
2009 – 2010	Member, 'A'-level Mathematics Syllabuses Consultative Committee, Ministry of Education
2007 – 2008	Member, Advisory Committee, Climate Change Exhibition I, Singapore Science Centre
2008 – 2022	Member, Selection Panel, WSPC-ICAAS Most Outstanding Junior College Science Student Award, jointly awarded by Imperical College Alumni Association of Singapore (ICAAS) and World Scientific Publishing Company (WSPC) and facilitated by the Ministry of Education
2006	Examiner, International Physics Olympiad

2005	Member, Steering Committee, Science.05, annual science activity month jointly organized by Singapore Science Centre and A*STAR

Research Interests

- Weather and climate of Southeast Asia
- Atmospheric modelling, prediction and predictability
- General circulation of the atmosphere
- Mixing and transport of tracers in fluids
- Geophysical fluid dynamics
- General Relativity, Lie Groups and Algebras, Quantum Field Theory

Research Grants

Total funding of $7,734,400 (SGD) over 15 years

2015 - 2017	$276,000	Rainfall as Self-Organized Criticality: Observations and Models
2013 - 2017	$1,093,100	Monsoon Dynamics, Predictability and Tropical Paleoclimate
2013 - 2015	$192,000	Rainfall, Mesoscale Weather, Climate Change and Urban Boundary Layer
2012 - 2014	$540,000	Weather Research IV
2011 - 2015	$562,700	Combined statistical downscaling and disaggregation of regional climate data
2011 - 2012	$184,800	Urban Boundary Layer and Mesoscale Weather Modelling
2010 - 2012	$184,800	Atmospheric Modelling of Singapore and Southeast Asia
2010 - 2011	$91,200	Urban Canyon and Boundary Layer Modelling
2009 - 2014	$579,800	Regional Climate Downscale of El Nino and Indian Ocean Dipole
2009 - 2012	$1,600,000	Weather Research III
2005 - 2008	$1,200,000	Weather Research II
2005 - 2016	$150,000	Geophysical Fluid Dynamics of Tropical Atmospheres
2002 - 2005	$1,080,000	Weather Research I

Publications

Journal Articles (Refereed)

1. Suematsu, T., Z. Martin, E. Barnes, C. Demott, S. Hagos, Y.-G. Ham, D. Kim, H, Kim, T. Y. Koh and E. Maloney (2024), “**Incorrect computation of Madden-Julian oscillation prediction skill**”, npj Climate and Atmospheric Science, 7, 134. DOI: 10.1038/s41612-024-00687-1.
2. Panda, J., T.-Y. Koh, A. Mukherjee, X.-X. Li, L. K. Norfod (2024), "**Numerical modeling of the distinct urbanization impact over Singapore during two contrasting weather scenarios**", Urban Climate, 55, 101924. DOI: 10.1016/j.uclim.2024.101924.

3. Koseki, S., R. Fonseca, T.-Y. Koh and C.-K. Teo (2023), “**Upper tropospheric cloud-radiation interaction induced by monsoon surge over the South China Sea**”, Meteorol. Appl., 30(2), e2125. DOI: 10.1002/met.2125.
4. Feng, L., T. Zhang, T.-Y. Koh and E. Hill (2021), "**Selected years of monsoon variations and extratropical dry-air intrusions compared with the Sumatran GPS Array observations in Indonesia**", J. Meteorol. Soc. Japan, 99(2), 505-536. DOI: 10.2151/jmsj.2021-026.
5. Teo, C.-K., T.-Y. Koh, K. K. W. Cheung, B. Legras, H. N. Huynh, L. Y. Chew and L. Norford (2021), "**Scaling characteristics of modelled tropical oceanic rain clusters**", Quart. J. Roy. Meteorol. Soc., 147(735), 1055-1069. DOI: 10.1002/qj.3959.
6. Tay, K, T.-Y. Koh and M. Skote (2021), "**Characterizing mesoscale variability in low-level jet simulations for CBLAST-LOW 2001 campaign**", Meteorol. Atmos. Phys., 133(2), 163-179. DOI: 10.1007/s00703-020-00736-3.
7. Fonseca, R., T.-Y. Koh and C.-K. Teo (2019), "**Multi-scale interactions in a high-resolution tropical-belt experiment and observations**", Clim. Dyn., 52(5), 3503-3532. DOI: 10.1007/s00382-018-4332-y.
8. Tieo, J.-J., T.-Y. Koh, M. Skote and N. Srikanth (2018), "**Variance characteristics of tropical radiosonde winds using a vector-tensor method**", Energies, 11(1), 137. DOI: 10.3390/en11010137.
9. Teo, C.-K., H.-N. Huynh, T.-Y. Koh, K. K. W. Cheung, B. Legras, L.-Y. Chew and L. Norford (2017), "**The universal scaling characteristics of tropical oceanic rain clusters**", J. Geophys. Res., 122(11), 5582–5599. DOI: 10.1002/2016JD025921.
10. Lestari, R. K. and T.-Y. Koh (2016), "**Statistical evidence for asymmetry in ENSO-IOD interaction**", Atmos. Ocean, 54(5), 498-504. DOI: 10.1080/07055900.2016.1211084.
11. Li, X. X., T.-Y. Koh, J. Panda and L. K. Norford (2016), "**Impact of urbanization patterns on the local climate of a tropical city Singapore: an ensemble study**", J. Geophys. Res., 121(9), 4386-4403. DOI: 10.1002/2015JD024452.
12. Koh, T.-Y. and R. Fonseca (2016), "**Subgrid-scale cloud-radiation feedback for the Betts-Miller-Janjic convection scheme**", Quart. J. Roy. Meteorol. Soc., 142(695), 989-1006. DOI: 10.1002/qj.2702.
13. Fonseca, R. M., T. Zhang and K. T. Yong (2015), "**Improved simulation of precipitation in the tropics using a modified BMJ scheme in the WRF model**", Geosci. Model Dev., 8, 2915-2928, DOI: 10.5194/gmd-8-2915-2015.
14. Koh, T.Y. and F. Wan (2015), "**Theory of the norm induced metric in atmospheric dynamics**", Atmospheric Chemistry and Physics, 15, 2571-2594, DOI: 10.5194/acp-15-2571-2015.
15. Chen, H., P. Malanotte-Rizzoli, T.-Y. Koh, G. Song (2014), **"The relative importance of the wind-driven and tidal circulations in Malacca Strait**", Cont. Shelf Res., 88, 92-102. DOI: 10.5194/acp-15-2571-2015.
16. Koseki, S., T.-Y. Koh and C.-K. Teo (2014), "**Borneo vortex and meso-scale convective rainfall**", Atmos. Chem. and Phys., 14, 4539-4562, DOI: 10.5194/acp-14-4539-2014.

17. Lee, S. Y. and T. Y. Koh (2014), "**Isentropic Primitive Equations for the Troposphere**", Quarterly Journal of the Royal Meteorological Society, 140(685), 2484â€“2490. DOI: 10.1002/qj.2312.
18. Li, X. X., T.-Y. Koh, D. Entekhabi, M. Roth, J. Panda and L. K. Norford (2013), "**A multi-resolution ensemble study of a tropical urban environment and its interactions with the background regional atmosphere**", J. Geophys. Res., 118(17), 9804-9818. DOI: 10.1002/jgrd.50795.
19. Koseki, S., T. Y. Koh and C. K. Teo (2013), "**Effects of the Cold Tongue in the South China Sea on the Monsoon, Diurnal Cycle and Rainfall in the Maritime Continent**", Quart. J. Roy. Meteorol. Soc., 139(675), 1566-1582. DOI: 10.1002/qj.2052.
20. Koh, T. Y., S. Wang and B. C. Bhatt (2012), "**A diagnostic suite to assess NWP performance**", J. Geophys. Res., 117, D13109, DOI: 10.1029/2011JD017103.
21. Lee, S. Y. and Koh, T. Y. (2012), "**Teleconnection between Australian winter temperature and Indian summer monsoon rainfall**", Atmospheric Chemistry and Physics, 12, 669-681, DOI:10.5194/acp-12-669-2012.
22. Li, X. X., R. E. Britter, L. K. Norford, T. Y. Koh and D. Entekhabi (2012), "**Flow and pollutant transport in urban street canyons of different aspect ratios with ground heating: large-eddy simulation**", Bound. Layer Meteorol., 142(2), 289-304. DOI: 10.1007/s10546-011-9670-9.
23. Koh, T. Y., B. C. Bhatt, K. K. W. Cheung, C. K. Teo, Y. H. Lee, M. Roth and Purnawirman (2012), "**Using the spectral scaling exponent for validation of quantitative precipitation forecasts**", Meteorology and Atmospheric Physics, 115(1), 35-45, DOI:10.1007/s00703-011-0166-4.
24. Teo, C. K., T. Y. Koh, C. F. Lo, B. C. Bhatt (2011), "**Principal Component Analysis of observed and modelled diurnal rainfall in the Maritime Continent**", J. Clim., 24(17), 4662-4675. DOI: 10.1175/2011JCLI4047.1.
25. Koh, T. Y., Y. S. Djamil and C. K. Teo (2011), "**Statistical dynamics of tropical wind in radiosonde data**", Atmos. Chem. and Phys., 11, 4177-4189, DOI: 10.5194/acp-11-4177-2011.
26. Li, X. X., R. E. Britter, T. Y. Koh, L. K. Norford, C. H. Liu, D. Entekhabi and Y. C. Leung (2010), "**Large-eddy simulation of flow and pollutant transport in urban street canyons with ground heating**", Bound. Layer Meteorol., 137(2), 187-204, DOI: 10.1007/s10546-010-9534-8.
27. Bhatt, B. C., T. Y. Koh, M. K. Yamamoto and K. Nakamura (2010), "**Diurnal Cycle of Convective Activity over South Asia Diagnosed from METEOSAT-5 and TRMM Data**", Terrestrial, Atmospheric and Oceanic Sciences, 21 (5), 841-854, DOI: 10.3319/TAO.2010.02.04.01(A).
28. Teo, C. K. and T. Y. Koh (2010), "**Nadir correction of AIRS radiances**", Journal of Atmospheric and Oceanic Technology, 27, 470-480, DOI:10.1175/2009JTECHA1341.1.
29. Koh, T. Y. and J. S. Ng (2009), "**Improved Diagnostics for NWP Verification in the Tropics**", J. Geophys. Res., 114, D12102, DOI: 10.1029/2008JD011179.
30. Koh, T. Y. and C. K. Teo (2009), "**Towards a mesoscale observation network in Southeast Asia**", Bull. Amer. Meteor. Soc., 90(4), DOI: 10.1175/2008BAMS2561.1.
31. Joseph, B., B. C. Bhatt, T. Y. Koh and S. Chen (2008), "**Sea breeze simulation over Malay Peninsula over an intermonsoon period**", J. Geophys. Res., 113, D20122, DOI: 10.1029/2008JD010319.

32. Koh, T. Y. and R. A. Plumb (2004), "**Isentropic zonal average formalism and the near-surface circulation** ", Quart. J. Roy. Meteorol. Soc., 130(600), 1631-1654. DOI: 10.1256/qj.02.219.
33. Koh, T. Y. and B. Legras (2002), "**Hyperbolic lines and the stratospheric polar vortex**", Chaos, 12(2), 382-394. DOI: 10.1063/1.1480442. [most cited paper]
34. Koh, T. Y. and R. A. Plumb (2000), "**Lobe dynamics applied to barotropic Rossby-wave breaking**", Phys. Fluids, 12(6), 1518-1528. DOI: 10.1063/1.870400.

Book Chapters

1. Annamalai, H., W. R. Boos, G. Martin, B. Mapes, Y. Ming, P. Mukhopadhyay, T.-Y. Koh and S. Rao (2021), "**Grand Challenges in Asian Summer Monsoon Modeling — Representation of Processes and Sources of Model Error**" in The Multiscale Global Monsoon System, C.-P. Chang, K.-J. Ha, R. H. Johnson, D. Kim, G. N. C. Lau and B. Wang, Eds., Vol. 11, World Scientific Series on Asia-Pacific Weather and Climate, World Scientific Publishing Co, pp. 420. ISBN: 978-981-121-659-6 (hardcover), 978-981-121-661-9(e-book).
2. Robertson, A. W., V. Moron, C.-P. Chang, F. Tangang, E. Aldrian, T. Y. Koh, L. Juneng (2011), "**The Maritime Continent Monsoon**" in The Global Monsoon System - Research and Forecast, C.-P. Chang, Y. Ding, N.-C. Lau, R. H. Johnson, B. Wang and T. Yasunari, Eds., Vol. 5, World Scientific Series on Asia-Pacific Weather and Climate, World Scientific Publishing Co, pp. 594. ISBN: 978-981-4343-40-4.
3. Koh, T. Y. and P. Linden (2011), "**Geophysical and Environmental Fluid Mechanics**" in Environmental Hazards, the Fluid Dynamics and Geophysics of Extreme Events, H. K. Moffatt and E. Shuckburgh, Eds., Vol. 21, Lecture Notes Series, Institute for Mathematical Sciences, National University of Singapore, World Scientific Publishing Co, pp. 315. ISBN: 978-981-4366-99-1.

Proceeding Papers

1. Ajayamohan, R. S., G. Martin, T. Turkington, H. Fujinami, J. Basconcillo, H. Annamalai, S. Jayawardena, R. Ashrit, H. Takahashi, and T. Y. Koh (2024), "**Asian Summer Monsoon Variability during 2022–2023: Beyond Canonical Teleconnection Patterns**", GEWEX Quarterly, 34(3), 8 – 10.
2. Koh T.-Y. (2015), "**Statistical Distributions and Climate Change**", Procedia IUTAM, 17, 53-58, DOI: 10.1016/j.piutam.2015.06.009.
3. Panda, J. and T.-Y. Koh (2014), "**Interaction between urban surface boundary and mesoscale weather**", Proceedings of the 11th Symposium on the Urban Environment, American Meteorological Society, 2-6 February 2014.
4. Koh, T. Y. and R. A. Plumb (2003), "**Isentropic zonal average formalism and the near-surface circulation**", Proceedings of the 14th Conference on Atmospheric and Oceanic Fluid Dynamics, American Meteorological Society, 9-13 June 2003.

Technical Publications

1. K. Saito, T. Kuroda, S. Hayashi, H. Seko, M. Kunii, Y. Shoji, M. Ueno, T. Kawabata, S. Yoden, S. Otsuka, N. J. Trilaksono, T.-Y. Koh, S. Koseki, L. Duc, K. T. Xin, W.-K. Wong and K. C. Gouda (2011), "**International Research for Prevention and Mitigation of Meteorological Disasters in Southeast Asia**", Technical Reports of the Meteorological Research Institute, 65, pp.198, ISSN: 0386-4049.
2. Koh, T. Y. (2010), "Alpha index" and "Elliptical representation of vector errors" in **Forecast Verification: Issues, Methods and FAQ**, by WWRP/WGNE Joint Working Group on Forecast Verification Research, WWRP-WCRP, World Meteorological Organization. (Accessible at https://www.cawcr.gov.au/projects/verification/)

PhD Thesis

1. Koh, T. Y. (2001), "**Isentropic diagnostics of mid-latitude circulation and transport**", Ph.D. thesis, Massachusetts Institute of Technology, USA, 288pp.

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