

CURRICULUM VITAE

CHENG-KU YU

SUMMARY: I have made long-term research efforts to improve our fundamental understanding of orographic precipitation and tropical cyclone rainbands. These observational works have original and innovative contributions to the basic sciences for the processes leading to the occurrence of heavy precipitation associated with topographic effects and the generation of tropical cyclone rainbands. What we learn from these studies has pivotal influences on improving the understanding and forecast of severe weather events in Taiwan as well as in other mountainous islands and regions of the world.

EDUCATION

1995	Ph. D., Atmospheric Sciences, National Taiwan University
1991	M. S., Atmospheric Sciences, National Taiwan University
1989	B. S., Meteorology, Chinese Culture University

POSITIONS

2023-present	Distinguished Professor, Department of Atmospheric Sciences, National Taiwan University
2021-present	Chair, Department of Atmospheric Sciences, National Taiwan University
2021-present	Director, Center for Atmospheric resource and disaster studies, National Taiwan University
2020-2021	Acting Chair, Department of Atmospheric Sciences, National Taiwan University
2018-2023	Director, Typhoon Research Center, College of Science, National Taiwan University
2014-2023	Professor, Department of Atmospheric Sciences, National Taiwan University
2009-2014	Professor, Department of Atmospheric Sciences, Chinese Culture University
2006-2009	Associate Professor, Department of Atmospheric Sciences, Chinese Culture University
2003-2006	Assistant Professor, Department of Atmospheric Sciences, Chinese Culture University
2001-2003	Postdoctoral Researcher Exclusively Engaged by the Ministry of Science and Technology of Taiwan, Department of Atmospheric Sciences, National Taiwan University
1999-2000	Postdoctoral Researcher, Department of Atmospheric Sciences, National Taiwan University
1996-1999	Research Associate, Department of Atmospheric Sciences, University of Washington
1995-1996	Postdoctoral Researcher, Postdoctoral fellowship of the National Youth Commission of Taiwan

HONORS AND AWARDS

- Fellow of the Meteorological Society of the Republic of China (2025)
- Distinguished Professor, National Taiwan University (2023)
- Outstanding Research Award, Ministry of Science and Technology (2021)
- Professor with exemption of review, College of Science, National Taiwan University (2018)
- Professor with Exceptional Performance by National Taiwan University (2018-2023)
- Teaching Award, National Taiwan University (2017)
- PI Fellowship of Special Excellence Awarded by the Ministry of Science and Technology of Taiwan (2010-2014)
- Excellent Young Scientist Research Project Awarded by the Ministry of Science and Technology of Taiwan (2011-2014)
- Outstanding Teaching Award (College of Science), Chinese Culture University (2011)

- Excellent Guidance Counselor in the 2010-2011 academic year, Chinese Culture University (2007, 2011)
- Best Reviewer Award, Terrestrial, Atmosphere and Oceanic Sciences (TAO) (2010)
- Research Paper Award, Chinese Culture University (2005-2014)

SELECTED STUDENT AWARDS AND PAPER HIGHLIGHTS

- Outstanding Presentation Award of American Meteorological Society (AMS) 21st Conference on Mountain Meteorology Received by Supervised Ph.D Student (Tsubaki Hosokawa) (2024)
- Nature Communications Paper (Yu, Lin and Pun, 2023) Highlighted in SPEC Monthly (April, 2024), NTU Newsletter (Dec. 2023) and COS of NTU e-News (2023)
- Matsuno Prize of 2023 Spring Meeting of the Meteorological Society of Japan Received by First Author of the NTU-KU Collaborative Work (Shimizu R., S. Shige, T. Iguchi, C.-K. Yu, and L.-W. Cheng, 2023: Narrowing the blind zone of the GPM dual-frequency precipitation radar to improve shallow precipitation detection in mountainous Areas. *J. Appl. Meteorol. Climatol.* **62**, 1437-1450, doi: org/10.1175/JAMC-D-22-0162.1.)
- Outstanding Student Presentation Award of 15th International Conference on Mesoscale Convective Systems and High-Impact Weather Received by Supervised Ph.D Student (Tsubaki Hosokawa) (2023)
- Best Student Poster Award of 19th Asia Oceania Geosciences Society (AOGS) Annual Meeting Received by Supervised Ph.D Student (Tsubaki Hosokawa) (2022)
- Scientific Reports Paper (Yu et al., 2018) Highlighted in COS of NTU e-News
- Water Resources Research Paper (Huang, Yu and Others, 2012) Highlighted in AGU Research Spotlight (EOS Vol. 93 No. 47) and NTU Newsletter

RESEARCH INTERESTS

Orographic Precipitation

Structure and Formation of Typhoon and Frontal Rainbands

Severe and Mesoscale Weather Systems

Tropical and Mid-latitude Convective Systems

Local Circulation and Precipitation

Ground-based and Airborne Radar Remote Sensing and Applications

PROFESSIONAL SERVICES

- Editor, Geoscience Letters (IF=4.0), AOGS (2017-present)
- Guest Editor, Remote Sensing (IF=4.2), (2021-2022)
- Editor-in-Chief, Atmospheric Sciences, Meteorological Society of the ROC (Taiwan) (2017-2021)
- Reviewer of Journal Papers:
 - Bulletin of the American Meteorological Society
 - Journal of Climate
 - npj Climate and Atmospheric Science
 - Journal of the Atmospheric Sciences
 - Atmospheric Chemistry and Physics
 - Scientific Reports
 - Quarterly Journal of the Royal Meteorological Society
 - Monthly Weather Review

International Journal of Climatology
 Journal of Geophysical Research (Atmospheres)
 Atmospheric Research
 Journal of the Meteorological Society of Japan
 Journal of Applied Meteorology and Climatology
 Weather and Forecasting
 Advances in Atmospheric Sciences
 Natural Hazards
 Asia-Pacific Journal of Atmospheric Sciences
 Meteorology and Atmospheric Physics
 Journal of Mechanical Science and Technology
 Terrestrial, Atmosphere and Oceanic Sciences
 Tropical Cyclone Research and Review
 Journal of Chung Cheng Institute of Technology (EI)
 World Meteorological Organization sponsored book
 World Scientific Publishing Co. Pte. Ltd.
 Atmospheric Sciences (Taiwan)
 Journal of Ching Yun University

- Reviewer of U.S. National Science Foundation (NSF) Research Proposals
- Accreditation committee member, National Science and Technology Center for Disaster Reduction (2017-present)
- Executive steering committee member, FORMOSAT-7/COSMIC-2 joint mission (2017-2023)
- Section Secretaries of Atmospheric Sciences, AOGS (2015-2023)
- Co-chair of panel committee, Atmospheric Science Discipline, Department of Natural Sciences and Sustainable Development, Ministry of Science and Technology (2019)
- Panel committee member, Atmospheric Science Discipline, Department of Natural Sciences and Sustainable Development, Ministry of Science and Technology (2017-2019)
- Panel committee member, Earth Science Research Promotion Center, Ministry of Science and Technology (2017-2019)
- Council member, Meteorological Society of the ROC (Taiwan) (2019-2023, 2024)
- Academic council commissioner, Meteorological Society of the ROC (Taiwan) (2017-2019)

PROFESSIONAL AFFILIATION

Member, ROC (Taiwan) Meteorological Society
 Member, American Meteorological Society (AMS)
 Member, American Geophysical Union (AGU)
 Member, Asia Oceania Geosciences Society (AOGS)

JOURNAL ARTICLES (*corresponding author)

Cheng, L.-W., **C.-K. Yu*** and S.-P. Chen, 2025: Identifying mechanisms of tropical cyclone generated orographic precipitation with Doppler radar and rain gauge observations. *npj Clim. Atmos. Sci.*, **8**, 35, doi: 10.1038/s41612-025-00921-4.

- Yu, C.- K.***, C.- Y. Lin and C.- H. Pun, 2023: Origin of outer tropical cyclone rainbands. *Nat. Commun.*, **14**, 7061 (2023), doi: <https://doi.org/10.1038/s41467-023-42896-x>.
- Shimizu R., S. Shige, T. Iguchi, **C.-K. Yu**, and L.-W. Cheng, 2023: Narrowing the blind zone of the GPM dual-frequency precipitation radar to improve shallow precipitation detection in mountainous Areas. *J. Appl. Meteorol. Climatol.* **62**, 1437-1450, doi: [org/10.1175/JAMC-D-22-0162.1](https://doi.org/10.1175/JAMC-D-22-0162.1).
- Yu, C.- K.***, W.- F. Liu, L.- W. Cheng, and C.- Y. Lin, 2022: Mechanisms of valley precipitation enhancement over Da-Tun Mountain. *Mon. Wea. Rev.*, **150**, 1851-1871, doi.org/10.1175/MWR-D-21-0195.1
- Chen, J.- P.*, T.-W. Hsieh, Y.-C. Lin, and **C.-K. Yu**, 2022: Accurate parameterization of precipitation particles' fall speeds for bulk cloud microphysics schemes. *Atmos. Res.*, **273**, doi:10.1016/j.atmosres.2022.106171.
- Lin, C.- Y. and **C.- K. Yu***, 2021: Taiwan rainbands formed in the outer region of tropical cyclones. *Mon. Wea. Rev.*, **149**, 1403-1418, doi: 10.1175/MWR-D-20-0216.1.
- Yu, C.- K.***, L.- W. Cheng, C.- C. Wu, and C.- L. Tsai, 2020: Outer tropical cyclone rainbands associated with Typhoon Matmo (2014). *Mon. Wea. Rev.*, **148**, 2935-2952, doi: 10.1175/MWR-D-20-0054.1.
- Chang, W.- Y., G.- W. Lee*, B. J.- D. Jou, W.- C. Lee, P.- L. Lin, and **C.- K. Yu**, 2020: Uncertainty in measured raindrop size distributions from four types of collocated instruments. *Remote Sens.*, **12**(7), 1167, doi: 10.3390/rs12071167.
- Huang, G.- Z., T.- C. Hsu, **C.- K. Yu**, J.- C. Huang*, and T.- C. Lin*, 2020: Dilution and precipitation dominated regulation of stream water chemistry of a volcanic watershed. *J. Hydrol.*, **583**, 124564, doi: 10.1016/j.jhydrol.2020.124564.
- Cheng, L.- W., and **C.- K. Yu***, 2019: Investigation of orographic precipitation over an isolated, three-dimensional complex topography with a dense gauge network, radar observations, and upslope model. *J. Atmos. Sci.*, **76**, 3387-3409, doi: 10.1175/JAS-D-19-0005.1.
- Yu, C.- K.***, C.- Y. Lin, and J.- S. Luo, 2019: Tracking a long-lasting outer tropical cyclone rainband: Origin and convective transformation. *J. Atmos. Sci.*, **76**, 3267-3283, doi: 10.1175/JAS-D-19-0126.1.
- Chen, Y.- C.*, K.- T. Chang, S.- F. Wang, J.- C. Huang, **C.- K. Yu**, J.- Y. Tu, H.- J. Chu and C.- C. Liu, 2019: Controls of preferential orientation of earthquake- and rainfall-triggered landslides in Taiwan's orogenic mountain belt. *Earth Surf. Process. Landforms*, doi:10.1002/esp.4601.
- Tsai, C.- L. *, K. Kim, Y.- C. Liou, G.- W. Lee and **C.- K. Yu**, 2018: Impacts of topography on airflow and precipitation in the Pyeongchang area seen from multiple-Doppler radar observations. *Mon. Wea. Rev.*, **146**, 3401-3424, doi: 10.1175/MWR-D-17-0394.1.
- Yu, C.- K.***, C.- Y. Lin, L.- W. Cheng, J.- S. Luo, C.- C. Wu, and Y. Chen, 2018: The degree of prevalence of similarity between outer tropical cyclone rainbands and squall lines. *Sci. Rep.*, **8**, 8247, doi: 10.1038/s41598-018-26553-8.
- Schomakers, J., H. Mayer, J.- Y. Lee, T.- Y. Lee, S.- H. Jien, A. Mentler, T. Hein, J.- C. Huang, Z.- Y. Hseu, L.- W. Cheng, **C.- K. Yu**, and F. Zehetner*, 2018: Soil aggregate breakdown and carbon release along a chronosequence of recovering landslide scars in a subtropical watershed. *Catena*, **165**, 530-536, doi:

10.1016/j.catena.2018.03.004.

- Yamamoto, M. K.*, S. Shige, C.- K. Yu, and L.- W. Cheng, 2017: Further improvement of the heavy orographic rainfall retrievals in the GSMap algorithm for microwave radiometers. *J. Appl. Meteorol. Climatol.*, **56**, 2607-2619, doi: 10.1175/JAMC-D-16-0332.1.
- Yu, C.- K.*, and C.- Y. Lin, 2017: Formation and maintenance of a long-lived Taiwan rainband during 1-3 March 2003. *J. Atmos. Sci.*, **74**, 1211-1232, doi:10.1175/JAS-D-16-0280.1.
- Yu, C.- K.*, and C.- L. Tsai, 2017: Structural changes of an outer tropical cyclone rainband encountering the topography of northern Taiwan. *Quart. J. Roy. Meteor. Soc.*, **143**, 1107–1122, doi: 10.1002/qj.2994.
- Yue, J., Z. Meng*, C.- K. Yu, and L.- W. Cheng, 2017: Impact of coastal radar observability on the forecast of track and rainfall of typhoon Morakot (2009) using a WRF-based EnKF data assimilation. *Adv. Atmos. Sci.*, **34**(1), 66-78, doi: 10.1007/s00376-016-6028-8.
- Lin, P.- H., Y.- J. Yang, C.- H. Liu, S.- P. Hsu, J.- H. Yang, C.- H. Wu, C.- K. Yu, S. Jan and C.- H. Sui*, 2016: Interaction of convection over the maritime continent - SCS with large-scale flow: 2016 winter monsoon pre-experiment . *Atmos. Sci.*, **44**(4), 237-352. (in Chinese with English abstract)
- Lin, C.- Y., and C.- K. Yu*, 2016: Effect of sea surface temperature on the convective lines off the southeastern coast of Taiwan. *Atmos. Sci.*, **44**(3), 215-235. (in Chinese with English abstract)
- Wu, C.- C.*, T.- H. Yen, Y.- H. Huang, C.- K. Yu, and S.- G. Chen, 2016: Statistical characteristic of heavy rainfall associated with typhoons near Taiwan based on the high-density automatic gauge data. *Bull. Amer. Meteor. Soc.*, **97**, 1363-1375, doi:10.1175/BAMS-D-15-00076.1.
- Yu, C.- K.*, P.- R. Hsieh, S. E. Yuter, L.- W. Cheng, C.- L. Tsai, C.- Y. Lin, and Y. Chen, 2016: Measuring droplet fall speed with a high-speed camera: Indoor accuracy and potential outdoor applications. *Atmos. Meas. Tech.*, **9**, 1755-1766, doi: 10.5194/amt-9-1755-2016.
- He, S., A. K. Liu, C.- K. Yu, Z. He*, J. Yang, G. Zheng, Y. Chen, 2016: Rainband feature tracking for wind speeds around typhoon eyes using multiple sensors. *Int. J. Remote Sens.*, **37**, 2016-2031, doi: 10.1080/01431161.2016.1142690.
- Yu, C.- K.*, and L.- W. Cheng, 2014: Dual-Doppler-derived profiles of the southwesterly flow associated with southwest and ordinary typhoons off the southwestern coast of Taiwan. *J. Atmos. Sci.*, **71**, 3202-3222, doi: 10.1175/JAS-D-13-0379.1.
- Cheng, L.- W., and C.- K. Yu*, 2014: Study of intensive rainfall observations over Da-Tun mountains: Distribution of orographic precipitation during the northeasterly monsoon. *Atmos. Sci.*, **42**(1), 61-85. (in Chinese with English abstract)
- Yu, C.- K.*, and L.- W. Cheng, 2013: Distribution and mechanisms of orographic precipitation associated with Typhoon Morakot (2009). *J. Atmos. Sci.*, **70**, 2894-2915, doi: 10.1175/JAS-D-12-0340.1.
- Yu, C.- K.*, and P.- R. Hsieh , 2013: Observational study of near-surface droplet fall speed. *Natural Sciences Newsletter*, Ministry of Science and Technology (National Science Council), **25**(1), 4-9.
- Yu, C.- K.*, and C.- L. Tsai, 2013: Structural and surface features of arc-shaped radar echoes along an outer tropical cyclone rainband. *J. Atmos. Sci.*, **70**, 56-72, doi: 10.1175/JAS-D-12-090.1.
- Huang, J.- C., C.- K. Yu*, J.- Y. Lee, L.- W. Cheng, T.- Y. Lee, and S.- J. Kao, 2012: Linking typhoon tracks and spatial

rainfall patterns for improving flood lead time predictions over a mesoscale mountainous watershed. *Water Resour. Res.*, **48**, W09540, doi:10.1029/2011WR011508. (AGU Research Spotlight, EOS Vol. 93 No. 47)

- Tsai, C.- L.*, and C.- K. Yu, 2012: Intercomparison analysis for Micro Rain Radar observations. *Atmos. Sci.*, **40**(2), 109-134. (in Chinese with English abstract)
- Tsai, C.- L.*, and C.- K. Yu, 2012: Structures of a typhoon rainband documented by dual-Doppler observations. *Quart. J. Meteor.*, **211**, 9-21. (in Chinese with English abstract)
- Yu, C.- K.*, and Y. Chen, 2012: Statistical analysis of surface characteristics of typhoon rainbands. *Natural Sciences Newsletter*, Ministry of Science and Technology (National Science Council), **24**(1), 8-14.
- Yu, C.- K.*, and Y. Chen, 2011: Surface fluctuations associated with tropical cyclone rainbands observed near Taiwan during 2000-08. *J. Atmos. Sci.*, **68**, 1568-1585, doi: 10.1175/2011JAS3725.1.
- Yu, C.- K.*, 2011: Orographic precipitation in the typhoon environment—unresolved and challenging issues. *Natural Sciences Newsletter*, Ministry of Science and Technology (National Science Council), **23**(1), 14-17.
- Yu, C.- K.*, and C.- L. Tsai, 2010: Surface pressure features of landfalling typhoon rainbands and their possible causes. *J. Atmos. Sci.*, **67**, 2893-2911, doi: 10.1175/2010JAS3312.1.
- Yu, C.- K.*, and Y.- H. Hsieh, 2009: Formation of the convective Lines off the mountainous coast of southeastern Taiwan: A case study of 3 January 2004. *Mon. Wea. Rev.*, **137**, 3072-3091, doi: 10.1175/2009MWR2867.1.
- Yu, C.- K.*, and C.- Y. Lin, 2008: Statistical location and timing of the convective Lines off the mountainous coast of southeastern Taiwan from long-term radar observations. *Mon. Wea. Rev.*, **136**, 5077-5094, doi: 10.1175/2008MWR2555.1.
- Yu, C.- K.*, and L.- W. Cheng, 2008: Radar observations of intense orographic precipitation associated with Typhoon Xangsane (2000). *Mon. Wea. Rev.*, **136**, 497-521, doi: 10.1175/2007MWR2129.1.
- Yu, C.- K.*, D. P. Jorgensen, and F. Roux, 2007: Multiple precipitation mechanisms over mountains observed by airborne Doppler radar during MAP IOP 5. *Mon. Wea. Rev.*, **135**, 955-984, doi: 10.1175/MWR3318.1.
- Tsai, C.- L.*, and C.- K. Yu, 2006: Preliminary analysis and application of the micro rain radar observations. *Quart. J. Meteor.*, **188**, 29-37. (in Chinese with English abstract)
- Yu, C.- K.*, and B. J.-D. Jou, 2005: Radar observations of the diurnally forced offshore convective lines along the southeastern coast of Taiwan. *Mon. Wea. Rev.*, **133**, 1613-1636, doi: 10.1175/MWR2937.1.
- Lin, P.- F., B. J.- D. Jou, and C.- K. Yu, 2003: Summer hailstorm observed by Doppler radars in northern Taiwan. *Atmos. Sci.*, **31**(4), 333-354. (in Chinese with English abstract)
- Yu, C.- K.*, and N. A. Bond, 2002: Airborne Doppler observations of a cold front in the vicinity of Vancouver Island. *Mon. Wea. Rev.*, **130**, 2692-2708, doi: 10.1175/1520-0493(2002)130<2692:ADOOAC>2.0.CO;2.
- Yu, C.- K., B. J.- D. Jou*, and D. P. Jorgensen, 2001: Retrieved thermodynamic structure of a subtropical, orographically influenced, quasi-stationary convective line. *Mon. Wea. Rev.*, **129**, 1099-1116, doi: 10.1175/1520-0493(2001)129<1099:RTSOAS>2.0.CO;2.
- Yu, C.- K., and B. F. Smull*, 2000: Airborne Doppler observations of a landfalling cold front upstream of steep

coastal orography. *Mon. Wea. Rev.*, **128**, 1577-1603, doi:
10.1175/1520-0493(2000)128<1577:ADOOAL>2.0.CO;2.

Yu, C.- K.*, B. J.-D. Jou, and B. F. Smull, 1999: Formative stage of a long-lived mesoscale vortex observed by airborne Doppler radar. *Mon. Wea. Rev.*, **127**, 838-857, doi:
10.1175/1520-0493(1999)127<0838:FSOALL>2.0.CO;2.

Jou, B. J.- D., and C.- K. Yu, 1991: Airborne Doppler radar observation of an oceanic mesoscale convective system during TAMEX. *Atmos. Sci.*, **19**(2), 149-176. (in Chinese with English abstract)