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Last update: 2020/04/13

EDUCATION

1990-Sep ~ 1996-Jun Ph.D. Graduate Institute of Environmental Engineering,
National Central Uni., Taiwan

1986-Sep ~ 1990-Jun B.S. Department of Environmental Science, Tung-Hai Uni., Taiwan

EMPLOYMENT

2016-Jan ~ present Deputy Director RCEC, Academia Sinica, Taiwan

2012-Mar ~ present Research Fellow RCEC, Academia Sinica, Taiwan

2007-Jan ~ 2012-Mar Associate Research Fellow RCEC, Academia Sinica, Taiwan

2001-Aug ~ 2007-Jan Assistant Research Fellow IES/RCEC, Academia Sinica, Taiwan

1996-Oct ~ 2001-Aug Research Fellow CESH, TRI, Taiwan

HONORS & AWARDS

2009 TAO Most Cited Article Award, Chinese Geoscience Union

2018 TAAR Chiu-Sen Award, Taiwan Aerosol Research Association

ACADEMIC SERVICE

- SSC member, the International Commission on Atmospheric Chemistry and Global Pollution (iCACGP, one of the Commissions of IAMAS/IUGG, <http://icacgp.org/>) [2019 ~ present]
- International SSC member, the Effect of Megacities on the transport and transformation of pollutants on the Regional and Global scales (EMeRGe, a DFG funded project, <http://www.iup.uni-bremen.de/emerge/home/home.html>) [2017 ~ present]
- Associate Editor, Atmospheric Research (a Journal published by Elsevier, <https://www.journals.elsevier.com/atmospheric-research/>) [2013 ~ present]
- Committee Member, Panel committee of Earth Science Research Promotion Center, MOST, Taiwan [2016 ~ present]
- Committee Member, Panel committee of Atmospheric Sciences, MOST, Taiwan [2016 ~ 2018]

RESEARCH INTERESTS

- Production, transformation and transport of urban air pollutants
- Physico-chemical characterization of atmospheric aerosols
- Air pollution and public health
- Atmospheric chemistry and climate change

RESEARCH HIGHLIGHTS

1. Long-term study on the East-Asian outflow aerosols and background air quality around Taiwan

The East-Asia (EA), in particular the eastern and northern China, is one of the major source regions of atmospheric aerosols in the world. The aerosols transported on the EA continental outflows could have significant impacts to the air quality and radiation budget in this region. Thus, I have started investigation on the physico-chemical properties of EA outflow aerosols since I joined RCEC in 2001.

2. Physico-chemical characterization of urban aerosols with implications for air pollution control strategies

Fine particulate matter (PM_{2.5}) and ozone (O₃) are the major air pollutants in not only Taiwan but also most of the urban areas in the world. Formulation of an effective control strategy for the ambient levels of PM_{2.5} and O₃ is thereby a great challenge. In the context, physico-chemical studies are critically important to air quality improvement because both O₃ and a large fraction of PM_{2.5} are known as secondary pollutants, which are products of atmospheric chemical reactions among the gaseous precursors emitted from respective pollution sources.

3. Cross-disciplinary study on the health impacts of particulate matters (PM)

Exposure to fine particulate matters (e.g., PM_{2.5}) were associated with diseases and thereby increases in morbidity and mortality. However, details in the physiologic mechanisms that are responsible for the association are not clear yet. In particular, while the physico-chemical properties of PM (e.g., chemical composition and size distribution) are highly variable, the association established in epidemiological studies is subject to significant uncertainties. In cross-disciplinary collaboration with toxicologists and physiologists, a series of in vivo studies on the physiologic responses to long-term exposure to urban PM were performed. The cross-disciplinary studies have elucidated the association between PM exposure and the changes in morbidity and mortality observed in epidemiological studies, which have, in together, contributed significant scientific evidences to support setting up of stricter laws and regulations on air pollution control.

PUBLICATIONS (2019 -2014)

1. Chen, Y.-C., **Chou, C. C.-K.**, Tsai, Y.-J., Chang, S.-Y., Chen, W.-N. (2019). The hourly characteristics of aerosol chemical compositions under fog and high particle pollution events in Kinmen. *Atmospheric Research*, 223, 132 – 141.
2. Lin, C.-A, Chen, Y.-C., Liu, C.-Y., Chen, W.-T., Seinfeld, J. H., **Chou, C. C.-K.** (2019). Satellite-derived correlation of SO₂, NO₂, and aerosol optical depth with meteorological conditions over East Asia from 2005 to 2015. *Remote Sensing*, 11, 1738;

doi:10.3390/rs11151738.

3. Chen, P.-Y., Tan, P.-H., **Chou, C. C.-K.**, Lin, Y.-S., Chen, W.-N., Shiu, C.-J. (2019). Impacts of holiday characteristics and number of vacation days on “holiday effect” in Taipei: Implications on ozone control strategies. *Atmospheric Environment*, 202, 357 – 369.
4. Jung, C.-C., **Chou, C. C.-K.***, Lin, C.-Y., Shen, C.-C., Lin, Y.-C., Huang, Y.-T., Tsai, C.-Y., Yao, P.-H., Huang, C.-R., Huang, W.-R., Chen, M.-J., Huang, S.-H., Chang, S.-C. (2019). C-Sr-Pb isotopic characteristics of PM_{2.5} transported on the East-Asian continental outflows. *Atmospheric Research*, 223, 88-97.
5. Lee, C. S. L., **Chou, C. C.-K.***, Cheung, H. C., Tsai, C.-Y., Huang, W.-R., Huang, S.-H., Chen, M.-J., Liao, H.-T., Wu, C.-F., Tsao, T.-M., Tsai, M.-J., Su, T.-C. (2019). Seasonal variation of chemical characteristics of fine particulate matter at a high-elevation subtropical forest in East Asia. *Environmental Pollution*, 246, 668-677.
6. Jung, C.-C., Wu, P.-C., Tseng, C.-H., **Chou, C. C.-K.**, Su, H.-J. (2018). Contribution of Indoor- and Outdoor-Generated Fine and Coarse Particles to Indoor Air in Taiwanese Hospitals. *AEROSOL AND AIR QUALITY RESEARCH*, 18, 3234-3242.
7. Adcock, K. E., Reeves, C. E., Gooch, L. J., Leedham Elvidge, E. C., Ashfold, M. J., Brenninkmeijer, C. A. M., **Chou, C. C.-K.**, Fraser, P. J., Langenfelds, R. L., Mohd Hanif, N., O'Doherty, S., Oram, D. E., Ou-Yang, C.-F., Phang, S. M., Samah, A. A., Röckmann, T., Sturges, W. T., and Laube, J. C. (2018). Continued increase of CFC-113a (CCl₃CF₃) mixing ratios in the global atmosphere: emissions, occurrence and potential sources, *Atmos. Chem. Phys.*, 18, 4737-4751.
8. Tsao, T.-M., Tsai, M.-J., Huang, J.-S., Cheng, W.-F., Wu, C.-F., **Chou, C. C.-K.**, Su, T.-C. (2018). Health effects of a forest environment on natural killer cells in humans: an observational pilot study. *Oncotarget*, 9, 16501-16511.
9. Chuang, H.-C., Lin, Y.-J., **Chou, C. C.-K.**, Hwang, J.-S., Chen, C.-C., Yan, Y.-H., Hsieh, H.-I., Chuang, K.-J., Cheng, T.-J. (2017). Alterations in cardiovascular function by particulate matter in rats using a crossover design. *Environmental Pollution*, 231, 812-820.
10. Liao, H.-T., Yau, Y.-C., Huang, C.-S., Chen, N., Chow, J. C., Watson, J. G., Tsai, S.-W., **Chou, C. C.-K.***, Wu, C.-F.* (2017). Source apportionment of urban air pollutants using constrained receptor models with a priori profile information. *Environmental Pollution*, 227, 323 – 333.
11. Ma, Y., Lu, K., **Chou, C. C.-K.**, Li, X., Zhang, Y. (2017). Strong deviations from the NO-NO₂-O₃ photostationary state in the Pearl River Delta: Indications of active peroxy radical and chlorine radical chemistry. *Atmospheric Environment*, 163, 22-34.
12. Liao, H.-T., **Chou, C. C.-K.**, Huang, S.-H., Lu, C.-J., Chen, C.-C., Hopke, P. K., Wu, C.-F. (2017). Source apportionment of PM_{2.5} size distribution and composition data from multiple stationary sites using a mobile platform. *Atmospheric Research*, 190, 21-28.
13. **Chou, C. C.-K.***, Hsu, W.-C., Chang, S.-Y., Chen, W.-N., Chen, M.-J., Huang, W.-R., Huang, S.-H., Tsai, C.-Y., Chang, S.-C., Lee, C.-T., Liu, S.-C. (2017). Seasonality of the mass

- concentration and chemical composition of aerosols around an urbanized basin in East Asia. *J. Geophys. Res. Atmos.*, 122, doi:10.1002/2016JD025728.
14. Pani, S. K., Lee, C.-T., **Chou, C. C.-K.**, Shimada, K., Hatakeyama, S., Takami, A., Wang, S.-H., Lin, N.-H. (2017). Chemical characterization of wintertime aerosols over islands and mountains in East Asia: Impacts of the continental Asian outflow. *Aerosol and Air Quality Research*, 17, 3006-3036.
 15. Huang, K.-L., Liu, S.-Y., **Chou, C.-C.-K.**, Lee, Y.-H., Cheng, T.-J. (2017). The effect of size-segregated ambient particulate matter on Th1/Th2-like immune responses in mice. *PLOS ONE*, 12, e0173158.
 16. Chuang, M.-T., **Chou, C. C.-K.**, Lin, N.-H., Takami, A., Hsiao, T.-C., Lin, T.-H., Fu, J. S., Pani, S. K., Lu, Y.-R., Yang, T.-Y. (2017). A simulation study on PM_{2.5} sources and meteorological characteristics at the northern tip of Taiwan in the early stage of the Asian haze period. *Aerosol and Air Quality Research*, 17, 3166-3178.
 17. Liu, C.-J., Liu, C.-Y., Mong, N. T., **Chou, C. C.-K.** (2016). Spatial correlation of satellite-derived PM_{2.5} with hospital admissions for respiratory diseases. *Remote Sensing*, 8, 914; doi:10.3390/rs8110914.
 18. Wu, C.-F., Shen, F.-H., Li, Y.-R., Tsao, T.-M., Tsai, M.-J., Chen, C.-C., Hwang, J.-S., Hsuh, S. H.-J., Chao, H., Chuang, K.-J., **Chou, C. C.-K.**, Wang, Y.-N., Ho, C.-C., Su, T.-C. (2016). Association of short-term exposure to fine particulate matter and nitrogen dioxide with acute cardiovascular effects. *Science of the Total Environment*, 569-570, 300-305.
 19. Salvador, C. M., Ho, T.-T., **Chou, C. C.-K.***, Chen, M.-J., Huang, W.-R., Huang, S.-H. (2016). Characterization of the organic matter in submicron urban aerosols using a Thermo-Desorption Proton-Transfer-Reaction Time-of-Flight Mass Spectrometer (TD-PTR-TOF-MS). *Atmospheric Environment*, 140, 565-575.
 20. Chuang, M.-T., Lee, C.-T., **Chou, C. C.-K.**, Chou, Engling, G., Chang, S.-Y., Chang, S.-C., Sheu, G.-R., Lin, N.-H., Sopajaree, K., Chang, Y. J., Hong, G.-J. (2016). Aerosol transport from Chiang Mai, Thailand to Mt. Lulin, Taiwan - Implication of aerosol aging during long-range transport. *Atmospheric Environment* 137 (2016) 101-112.
 21. Cheung, H. C., **Chou, C. C.-K.***, Chen, M.-J., Huang, W.-R., Huang, S.-H., Tsai, C.-Y., Lee, C. S. L. (2016). Seasonal variations of ultra-fine and submicron aerosols in Taipei, Taiwan: implications for particle formation processes in a subtropical urban area. *Atmos. Chem. Phys.*, 16, 1317-1330.
 22. Lin, Y.-C., Hsu, S.-C., **Chou, C. C.-K.**, Zhang, R., Wu, Y., Kao, S.-J., Luo, L., Huang, C.-H., Lin, S.-H., Huang, Y.-T. (2016). Wintertime haze deterioration in Beijing by industrial pollution deduced from trace metal fingerprints and enhanced health risk by heavy metals. *Environmental Pollution*, 208, 284-293.
 23. Lee, C.-T., Ram, S. S., Nguyen, D. L., **Chou, C. C.-K.**, Chang, S.-Y., Lin, N.-H., Chang, S.-C., Hsiao, T.-C., Sheu, G.-R., Ou-Yang, C. F., Chi, K. H., Wang, S.-H., Wu, X.-C. (2016). Aerosol

Chemical Profile of Near-Source Biomass Burning Smoke in Sonla, Vietnam during 7-SEAS Campaigns in 2012 and 2013. *Aerosol and Air Quality Research*, 16, 2603–2617.

24. Liao, H. T., **Chou, C. C.-K.**, Chow, J. C., Watson, J. G., Hopke, P. K., Wu, C. F. (2015). Source and risk apportionment of selected VOCs and PM_{2.5} species using partially constrained receptor models with multiple time resolution data. *ENVIRONMENTAL POLLUTION*, 205, 121-130.
25. Tsai, I.-C., Chen, J.-P., Lin, Y.-C., **Chou, C. C.-K.**, Chen, W.-N. (2015). Numerical investigation of the coagulation mixing between dust and hygroscopic aerosol particles and its impacts. *JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES*, 120, 4213-4233.
26. Cheung, H. C., **Chou, C. C.-K.***, Jayaratne, E. R., Morawska, L. (2015). Impact of particle formation on atmospheric ions and particle number concentrations in an urban environment. *Atmospheric Research*, 157, 127-136.
27. Yan, Y.-H., **Chou, C. C.-K.**, Wang, J.-S., Tung, C.-L., Li, Y.-R., Lo, K., Cheng, T.-J. (2014). Subchronic effects of inhaled ambient particulate matter on glucose homeostasis and target organ damage in a type 1 diabetic rat model. *Toxicology and Applied Pharmacology*, 281, 211-220.
28. Salvador, C. M. and **Chou, C. C.-K.*** (2014). Analysis of semi-volatile materials (SVM) in fine particulate matter. *Atmos. Environ.*, 95, 288-295.
29. Chen, S. P., Chang, C. C., Liu, J. J., **Chou, C. C.-K.**, Chang, J. S., Wang, J. L. (2014). Recent improvement in air quality as evidenced by the island-wide monitoring network in Taiwan. *Atmos. Environ.*, 96, 70-77.
30. Tsao, T. M., Tsai, M. J., Wang, Y. N., in, H. L., Wu, C. F., wang, J. S., Hsu, S., Chao, H., Chuang, K. J., **Chou, C. C.-K.**, Su, T. C. (2014). The Health Effects of a Forest Environment on Subclinical Cardiovascular Disease and Heath-Related Quality of Life. **PLOS One**, 9(7): e103231.
31. Chuang, M.-T., Lee, C.-T., **Chou, C. C.-K.** et al. (2014). Carbonaceous aerosols in the air masses transported from Indochina to Taiwan: Long-term observation at Mt. Lulin. *Atmos. Environ.*, 89, 507-516.
32. Hung, H. M., Lu, W. J., Chen, W. N., Chang, C. C., **Chou, C. C.-K.**, Lin, P. H. (2014). Enhancement of the hygroscopicity parameter kappa of rural aerosols in northern Taiwan by anthropogenic emissions. *Atmos. Environ.*, 84, 78-87.
33. Kuo, C.-P., Liao, H.-T., **Chou, C.-C.-K.**, Wu, C.-F. (2014). Source apportionment of particulate matter and selected volatile organic compounds with multiple time resolution data. *Science of the Total Environment*, 472, 880-887.
34. Chi, K. H., **Chou, C. C.-K.**, Peng, C. M., Chang, M. B., Lin, C. Y., Li, C. T. (2014). Increase of Ambient PCDD/F Concentrations in Northern Taiwan during Asian Dust Storm and Winter Monsoon Episodes. *Aerosol and Air Quality Research*, 14, 1279-1291.