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A. Full CV

Education

- **Ph.D.:** Environmental Engineering, National Central University, Taiwan, 1996
- **B.S.:** Environmental Science, Tung-Hai University, Taiwan, 1990

Appointments

- **CEO of Air Quality Research Center**, Research Center for Environmental Changes, Academia Sinica (January 2021 – present)
- **Research Fellow**, Research Center for Environmental Changes, Academia Sinica (March 2012 – present)
- **Adjunct Professor**, Department of Atmospheric Sciences, National Taiwan University (August 2013 – present)
- **Adjunct Professor**, Department of Atmospheric Sciences, National Central University (August 2013 – present)

Honors & Awards

- **Invited Speaker**, The 2nd Topical Workshop on Transport and Transformation of Pollutants from European and Asian Major Population Centres. Bremen, Germany, 2018.
- **Invited Speaker**, 2017 Joint IAPSO-IAMAS-IAGA Assembly, Cape Town, South Africa 2017.
- **Invited Speaker**, Topical Workshop on Transport and Transformation of Pollutants from European and Asian Major Population Centres. Bremen, Germany, 2017.
- **Significant Research Achievement of Academia Sinica**, 2015
- **Significant Research Achievement of Academia Sinica**, 2013
- **Significant Research Achievement of Academia Sinica**, 2011
- **Invited Speaker**, 6th Annual Meeting of AOGS, Singapore, 2009
- **TAO Most Cited Article Award**, Chinese Geoscience Union, 2009
- **TAAR Chiu-Sen Award**, Taiwan Aerosol Research Association, 2008
- **Significant Research Achievement of Academia Sinica**, 2005

Publications for 2016 – 2021 (*: Corresponding author; # Number of citations based on Publons)

- Liao, H.-T., Lee, C.-L., Tsai, W.-C., Yu, J. Z., Tsai, S.-W., Chou, C. C.-K., Wu, C.-F.* (2021). Source apportionment of urban PM_{2.5} using positive matrix factorization with vertically distributed measurements of trace elements and nonpolar organic compounds. *Atmospheric Pollution Research*, 12, 200 – 207.
<https://doi.org/10.1016/j.apr.2021.03.007> (#: 0)
- Liao, H.-T., Chuang, M.-T., Tsai, P.-W., Chou, C. C.-K.*, Wu, C.-F.* (2021). Enhanced receptor modeling using expanded equations with parametric variables for secondary

- components of PM_{2.5}. *Aerosol and Air Quality Research*, 21(3), 200549.
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- Chen, C.-L., Chen, T.-Y., Hung, H.-M.*, Tsai, P.-W., Chou, C. C.-K., Chen, W.-N. (2021). The influence of upslope fog on hygroscopicity and chemical composition of aerosols at a forest site in Taiwan. *Atmospheric Environment*, 246, 118150.
<https://doi.org/10.1016/j.atmosenv.2020.118150> (#: 0)
 - Chao, H.-J., Huang, W.-C., Chen, C.-L., Chou, C. C.-K., Hung, H.-M.* (2020). Water adsorption vs. phase transition of aerosols monitored by a quartz crystal microbalance. *ACS Omega*, 5, 31858-31866. <https://doi.org/10.1021/acsomega.0c04698> (#: 0)
 - Salvador, C. M., Chou, C. C.-K.*, Ho, T.-T., Tsai, C.-Y., Tsao, T.-M., Tsai, M.-J., Su, T.-C. (2020). Contribution of terpenes to ozone formation and secondary organic aerosols in a subtropical forest impacted by urban pollution. *Atmosphere*, 11(11), 1232.
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 - Zhang, Y.*, Yu, F.*, Luo, G., Chen, J.-P., Chou, C. C. -K. (2020). Impact of Mineral Dust on Summertime Precipitation Over the Taiwan Region. *J. Geophys. Res. Atmosphere*, 125(19), e2020JD033120. <https://doi.org/10.1029/2020JD033120> (#: 0)
 - Singh, A., Chou, C. C.-K., Chang, S.-Y., Chang, S.-C., Lin, N.-H., Chuang, M.-T., Pani, S. K., Chi, K. H., Huang, C.-H., Lee, C.-T.* (2020). Long-term (2003-2018) trends in aerosol chemical components at a high-altitude background station in the western North Pacific: Impact of long-range transport from continental Asia. *Environmental Pollution*.265(B), 114813. <https://doi.org/10.1016/j.envpol.2020.114813> (#: 0)
 - Ohyama, H.*, Morino, I., Velazco, V. A., Klausner, T., Bagtasa, G., Kiel, M., Frey, M., Hori, A., Uchino, O., Matsunaga, T., Deutscher, N. M., DiGangi, J. P., Choi, Y., Diskin, G. S., Pusede, S. E., Fiehn, A., Roiger, A., Lichtenstern, M., Schlager, H., Wang, P. K., Chou, C. C.-K., Andres-Hernandez, M. D., Burrows, J. P. (2020). Validation of XCO₂ and XCH₄ retrieved from a portable Fourier transform spectrometer with those from in situ profiles from aircraft-borne instruments. *Atmospheric Measurement Techniques*, 13, 5149-5163. <https://doi.org/10.5194/amt-13-5149-2020> (#: 0)
 - Sun, C. Z., Adachi, K., Misawa, K., Cheung, H. C., Chou, C. C.-K., Takegawa, N.* (2020). Mixing State of Black Carbon Particles in Asian Outflow Observed at a Remote Site in Taiwan in the Spring of 2017. *J. Geophys. Res. Atmospheres*, 125(16), e2020JD032526. <https://doi.org/10.1029/2020JD032526> (#: 0)
 - Liao, H.-T., Chang, J.-C., Tsai, T.-T., Tsai, S.-W., Chou, C. C.-K., Wu, C.-F.* (2020). Vertical distribution of source apportioned PM_{2.5} using particulate-bound elements and polycyclic aromatic hydrocarbons in an urban area. *Journal Of Exposure Science And Environmental Epidemiology*, 30(4),659-669. <https://doi.org/10.1038/s41370-019-0153-2> (#: 3)
 - Cheung, H. C., Chou, C. C.-K.*, Lee, C. S. L., Kuo, W.-C., Chang, S.-C. (2020). Hygroscopic properties and cloud condensation nuclei activity of atmospheric aerosols under the influences of Asian continental outflow and new particle formation at a coastal site in eastern Asia. *Atmos. Chem. Phys.*, 20, 5911–5922.
<https://doi.org/10.5194/acp-20-5911-2020> (#: 6)
 - Droste, E. S.*, Adcock, K. E., Ashfold, M. J., Chou, C. C.-K., Fleming, Z., Fraser, P. J., Gooch, L. J., Hind, A. J., Langenfelds, R. L., Leedham Elvidge, E., Mohd Hanif, N., O'Doherty, S., Oram, D. E., Ou-Yang, C.-F., Panagi, M., Reeves, C. E., Sturges, W. T.,

- and Laube, J. C. (2020). Trends and emissions of six perfluorocarbons in the Northern Hemisphere and Southern Hemisphere. *Atmos. Chem. Phys.*, 20, 4787–4807, <https://doi.org/10.5194/acp-20-4787-2020>. (#:1)
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 - Chen, Y.-C.*, Chen, W.-N., Chou, C. C.-K., Matzarakis, A. (2020). Concepts and new implements for modified physiologically equivalent temperature. *Atmosphere*, 11, 694. doi:10.3390/atmos11070694, <https://www.mdpi.com/757240> (#: 2)
 - Salvador, C. M., Chou, C. C.-K.*, Cheung, H. C., Ho, T. T., Tsai, C.-Y., Tsao, T.-M., Tsai, M.-J., Su, T.-C. Su (2020). Measurements of submicron organonitrate particles: Implications for the impacts of NO_x pollution in a subtropical forest. *Atmos. Res.*, 245, 105080. <https://doi.org/10.1016/j.atmosres.2020.105080> (#: 1)
 - Liao, H.-T., Chang, J.-C., Tsai, T.-T., Tsai, S.-W., Chou, C. C.-K., Wu, C.-F. (2020). Vertical distribution of source apportioned PM_{2.5} using particulate-bound elements and polycyclic aromatic hydrocarbons in an urban area. *JESEE*, 30, 659-669. DOI: 10.1038/s41370-019-0153-2. <https://www.nature.com/articles/s41370-019-0153-2> (#: 3)
 - Hung, W.-T.*, Lu, C.-H., Wang, S.-H., Chen, S.-P., Tsai, F., Chou, C. C.-K. (2019). Investigation of long-range transported PM_{2.5} events over Northern Taiwan during 2005–2015 winter seasons. *Atmos. Environ.*, 217, 116920. <https://doi.org/10.1016/j.atmosenv.2019.116920>. (#: 4)
 - 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 Sens.*, 11, 1738. DOI: 10.3390/RS11151738(#: 6)
 - 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. DOI: 10.1016/J.ENVPOL.2018.11.033. (#: 6)
 - 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. *Atmos. Res.*, 223, 88-97. DOI: 10.1016/J.ATMOSRES.2019.03.011. (#: 4)
 - 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. *Atmos. Res.*, 223, 132-141. DOI: 10.1016/J.ATMOSRES.2019.03.008. DOI: 10.1016/J.ATMOSRES.2019.03.008. (#: 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. *Atmos. Environ.*, 202, 357-369. DOI: 10.1016/J.ATMOSENV.2019.01.029. (#: 5)

- 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. DOI: 10.4209/AAQR.2018.01.0006. (#: 1)
- 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. DOI: 10.5194/ACP-18-4737-2018. (#: 9)
- 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.
- 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. DOI: 10.4209/AAQR.2017.05.0185. (#: 20)
- 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. DOI: 10.4209/AAQR.2017.03.0097. (#: 19)
- 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. DOI: 10.1016/J.ENVPOL.2017.08.082. (#: 4)
- Ma, Y., Lu, K.* , Chou, C. C.-K., Li, X., Zhang, Y. (2017). Strong deviations from the NO-NO₂-O₃ photo-stationary state in the Pearl River Delta: Indications of active peroxy radical and chlorine radical chemistry. *Atmospheric Environment*, 163, 22-34. DOI: 10.1016/J.ATMOSENV.2017.05.012. (#: 6)
- 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. DOI: 10.1016/J.ENVPOL.2017.04.071. (#: 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. (#: 13)
- 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. DOI: 10.1016/J.ATMOSRES.2017.02.008. (#: 6)
- 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. DOI: 10.1371/JOURNAL.PONE.0173158. (#: 20)

- 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 Sens.*, 8, 914; doi:10.3390/rs8110914. (#: 10)
- Wu, C.-F.*, Shen, F.-H., Li, Y.-R., Tsao, T.-M., Tsai, M.-J., Chen, C.-C., Hwang, J.-S., Hsu, 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. DOI: 10.1016/J.SCITOTENV.2016.06.084 (#: 32)
- 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. DOI: 10.4209/AAQR.2015.07.0465 (#: 25)
- Chuang, M.-T.*, Lee, C.-T., Chou, C. C.-K., 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, 101-112.
- 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). *Atmos. Environ.*, 140, 565-575. DOI: 10.1016/J.ATMOSENV.2016.06.029 (#: 12)
- 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. DOI: 10.5194/ACP-16-1317-2016 (#: 6)
- 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. DOI: 10.1016/J.ENVPOL.2015.07.044 (#: 60)

Other Activities

- **SSC member**, the International Commission on Atmospheric Chemistry and Global Pollution (iCACGP) (2019 – present)
- **International SSC member**, the Effect of Megacities on the transport and transformation of pollutants on the Regional and Global scales (EMeRGe,) (2017 – present)
- **Associate Editor**, *Atmospheric Research* (2013 – present)
- **Committee Member**, Panel committee of Earth Science Research Promotion Center, MOST, Taiwan (2016 – 2020)
- **Committee Member**, Panel committee of Atmospheric Sciences, MOST, Taiwan (2016 – 2018)

B. Major Achievements and Contributions (2016-present)

- **Long-term study on the East-Asian pollution outflows 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 air pollutants in the world. The pollutants 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. One of the major tasks was to establish a long-term research station at a representative site. Cape Fuguei locates exactly at the northern tip of Taiwan (25°17'52.8" N, 121°32'16.8" E). This advantage allows the Cape Fuguei Research Station (CAFÉ) to be representative for investigation of Asian outflow air-mass under northeasterly monsoons without contamination of local pollution. I setup research facilities and started regular measurement of aerosol concentration and composition at CAFÉ Station since 2003. Observation of air pollutants have been performed at the CAFÉ research station for ~ 20 years, which is essential to studies on the changes of regional atmospheric composition. Moreover, this station is now serving as the national monitoring station of background air quality.

Recent research outcomes of this research station include: 1.) Cheung et al. (2020) indicated that gas-to-particle conversion processes could have played a significant role in the budget of aerosols in the study area. Based on our observation, this study raised hypothesis to elucidate how the newly formed nano-particles influence the activity of CCN, which has further evidenced the scientific argument of aerosol-cloud interaction. 2.) Droste et al., (2020) revealed that surface PFCs levels were enhanced around Taiwan, which evidenced the special climate impacts of electronic industry in the East Asia. This is the first publication showing this impact with high quality data. 3.) Adcock et al. (2020) assessed the emission of CFC-11 in China. We estimated CFC-11 emissions from China to have increased by 7 ± 5 Gg year⁻¹ from the 2008–2011 average to the 2014–2018 average, which was $50 \pm 40\%$ of the estimated increase in global CFC-11 emission.

- **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. I have been dedicated to studies on the formation of ozone and PM_{2.5} since I joined RCEC, and the research outcomes have helped elucidating the key processes governing the photochemical production of surface ozone and warned the issue of PM_{2.5} in Central/Southern Taiwan caused by photochemical production of secondary aerosols. Recent major outcomes include: 1.) Salvador et al. (2016) revealed that low molecular weight carboxylic acids (LMWCA, phthalic acid and glutaric acid for instance) constituted a major fraction of secondary organic aerosols in Taipei. This study demonstrated the substantial influences of photochemical oxidation of gaseous hydrocarbons and fatty acids in urban air quality with evidences of fundamental molecular chemistry. 2.) Cheung et al. (2016) revealed that the condensable organic molecules produced from photochemical reactions could have played critical roles in stabilization of the clusters of

sulfuric acid and, consequently, formation of new particles in urban environment. This study provided new experimental data to explain the occurrence of new particle burst events in a polluted urban area, which was thought confined in remote clean atmosphere. 3.) Salvador et al. (2020) found that the submicron particles in a forested area contained a significant amount of organonitrate, which were characterized by the molecular skeletons of either isoprene or monoterpenes. This finding evidenced the intrusion of urban air pollution into the forest ecosystem in the downwind area of a major city in Taiwan.

C. Future Plan

I am now serving as leading scientist of the newly established Air Quality Research Center (AQRC), a sub-center of RCEC. AQRC is charged by the President of Academia Sinica and the Director of RCEC with the duty of investigation on causes of air pollution in Taiwan and to publish recommendations for a more effective control strategy. To achieve this goal, I'll coordinate the research teams of AQRC to perform the following studies.

- **Diagnosis and attribution of air pollution in Central-Western Taiwan: From physical and chemical mechanism to mitigation strategy**

This is the flagship project of AQRC, which is supported by the Grand Challenge Program of Academia Sinica. We have identified some knowledge and/or technical issues that prevented us from formulation of an effective air pollution control strategy in Taiwan, which include uncertainties in emission inventory, poor understandings in local circulations and the photochemical production of secondary air pollutants. An integrated approach is proposed accordingly to investigate emissions, transport, and production/transformation of air pollutants. The data will support in-depth studies on the emission inventory, PBL structure and dynamics, and production of secondary air pollutants (O₃ and PM_{2.5}). The outcomes of this study will contribute crucial data and knowledge to the formulation of effective mitigation strategies of air pollution in the Central-Western Taiwan.

- **Leading the national mission-oriented project on the development of high resolution air quality forecast and diagnosis model**

This is a representative project that bridges our scientific capability to the needs of the society. In order to improve the air quality forecast service in Taiwan, the Ministry of Science and Technology launched a mission-oriented program in 2017. Dr. Charles Chou was assigned to lead the main project of this program. During the last four years, the outcomes of this project have significantly improved the operational forecast of Air Quality Index over Taiwan. In the next 4 years, our on-going tasks aim at further improvement in the spatial resolution of air quality forecast and development of tools for management of urban air quality.

- **Long-term study on the East-Asian pollution outflows and background air quality around Taiwan**

Observation of air pollutants have been performed at the Cape Fuguei Research Station for nearly 20 years, which is essential to not only studies on the long-term impacts of air pollution to the regional atmospheric composition but also the impacts of transboundary air pollution to Taiwan. International collaboration projects on investigation of regional atmospheric chemistry will keep running at this unique site.