

Zhi Ning, Ph.D

Assistant Professor, School of Energy and Environment
Deputy Director, Guy Carpenter Asia-Pacific Climate Impact Centre (GCCC)
City University of Hong Kong
Tel: 852-3442-4620 Fax: 852-2319-5927
Email: zhining@cityu.edu.hk
Website: <http://www.ninglab.org>
ResearchID: <http://www.researcherid.com/rid/E-9398-2011>
Updated: December, 2015

EDUCATION

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|---------|----------------------------|------|--|
| Ph.D, | Environmental Engineering, | 2009 | <i>University of Southern California, Los Angeles, CA</i> |
| M.Phil, | Mechanical Engineering, | 2004 | <i>Hong Kong Polytechnic University, Hong Kong</i> |
| B.Sc, | Energy Engineering, | 2002 | <i>University of Science and Technology of China, Hefei, China</i> |

RESEARCH INTERESTS

- Combustion sources emission characterization;
- Urban air quality and sensor network;
- Environmental monitoring technology development and application;
- Personal exposure to air pollution and in-vitro investigation.

RESEARCH PROJECTS

a) External competitive grants in chronological order:

| Funding Body | Period | Fund | Investigator | Title |
|--|--------------------------------|-------------|---------------------------------------|---|
| 1. General Research Fund (GRF/11204115) | 2016-01 to 2017-12 (On-going) | \$462,455 | Principal Investigator | Semi-volatile particulate matter (PM) species in roadside environment: Role in gas-particle partitioning and formation of oxidative potential |
| 2. Early Career Scheme (ECS/21201214) | 2015-01 to 2016-12 (On-going) | \$706,737 | Principal Investigator | Black carbon in urban atmosphere: size and coating from near-source to ambient environment |
| 3. Innovation and Technology Fund (ITF/ITS/324/13FP) | 2014-07 to 2016-06 (On-going) | \$1,684,750 | Principal Investigator | Development of a Smart, High Efficiency and Energy Saving PM2.5 Sensing and Purifying System for Indoor Air Cleaning |
| 4. Environmental Conservation Fund (ECF/01/2012) | 2013-06 to 2015-05 (Completed) | \$499,900 | Principal Investigator | Investigation of primary PM and NOx emissions from on-road vehicles and their effect on roadside air quality in Hong Kong |
| 5. Health and Medical Research Fund (HMRF/10112061) | 2013-03 to 2015-02 (Completed) | \$649,990 | Principal Investigator | Physicochemical and toxicological assessment of passenger daily exposure to air pollutants in various public transport systems in Hong Kong |
| 6. General Research Fund (GRF/102809) | 2010-01 to 2013-06 (Completed) | \$649,000 | Principal Investigator | Development of a New Technique to Derive Emission Inventories from Satellite Data |
| 7. General Research Fund (GRF/11304915) | 2016-01-01 to 2018-06-30 | \$448,572 | Co-Investigator with 50% contribution | Air pollution in sitting-out areas and playgrounds in the urban roadside environment |
| 8. General Research Fund (GRF/ | 2015-01-01 to | \$193,314 | Co-Investigator with 50% | Evolution of reactive oxygen species on particles in the |

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| 11304915) | 2017-12-31 | | contribution | roadside environment |
| 9. Innovative Technology Fund (ITF/ITS/348/12) | 2013-07 to 2015-01 (Completed) | \$720,000 | Co-Investigator with 50% contribution | Development of Testing Platforms and Standard Protocols for Performance, Nanoparticles Emission and Health Impact of Self-cleaning Nano-coating Textile Products |
| 10. General Research Fund (GRF/513012) | 2012-12 to 2015-11 (On-going) | \$500,000 | Co-Investigator with 30% contribution | Influence of biodiesel on physical and chemical properties of particulate matter emitted from a diesel engine |

Internal competitive grants in chronological order:

| Funding Body | Period | Fund | Investigator | Title |
|---|-----------------------------------|-----------|------------------------|---|
| 1. Campus Sustainability Fund (CSF/6986019) | 2015-03 to 2016-09 (On-going) | \$401,000 | Principal Investigator | Campus Air Monitoring (CAM) Network in CityU for Environmental Awareness and Energy Saving Facility Management |
| 2. Applied Research Grant (ARG/9667102) | 2014-05 to 2015-04 (Completed) | \$199,900 | Principal Investigator | New Generation of Greenhouse Gases Sensor by Dispersive Absorption Infrared Spectroscopy |
| 3. CityU Seed Grant (SG/7003053) | 2013-04 to 2014-03 (Completed) | \$60,000 | Principal Investigator | Impact of atmospheric aging processes on the airborne black carbon size distributions in urban environment |
| 4. CityU Applied R&D Funding (ARD/6351016) | 2013-01 to 2013-12 (Completed) | \$400,000 | Principal Investigator | Prototype Development of an Innovative Portable Air Sampler for Multiple PM _{2.5} and Bioaerosol Applications |
| 5. Strategic Research Grant (SRG/7002781) | 2012-08 to 2013-07 (Completed) | \$179,300 | Principal Investigator | Generation of Intracellular Reactive Oxygen Species from Size-Segregated Ambient Particulate Matter (PM) in Different Environments in Hong Kong |
| 6. CityU Idea Incubator (6987011) | 2013-05 to 2014-08 (Completed) | \$400,000 | Principal Investigator | Developing a Student-oriented Community CO ₂ Observation Network to Promote Students' Environmental Awareness and Community Engagement |

Contract and consultancy research grants in chronologic order:

| Funding Body | Period | Fund | Investigator | Title |
|--|----------------------------------|-------------|------------------------|---|
| 1. Environmental Protection Department, HKSAR (HKEPD/14-02771) | 2014-12 to 2016-06 (On-going) | \$1,200,000 | Principal Investigator | Provision of Services for Quality Assurance and Protocol development of Next Generation Air Monitoring for Supersites Programme |
| 2. Environmental Protection Department, HKSAR (HKEPD/15-00303) | 2015-07 to 2016-07 (On-going) | \$1,380,000 | Principal Investigator | Provision of Services for Continuous Monitoring of Roadside Air Quality in the Northern Part of Hong Kong |
| 3. U.S. Environmental Protection Agency | 2014-09 to 2015-09 | \$171,570 | Principal Investigator | CONSULTANCY SERVICES for the deployment of USEPA Green |

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| | (USEPA) via ARCADIS, U.S. Inc. | (Completed) | | | Village Project (VGP) sensor package in Hong Kong |
| 4. | Environmental Protection Department, HKSAR (HKEPD/14-0488) | 2015-02 to 2016-02 (Completed) | \$630,000 | Principal Investigator | Supply of Two Sets of Automated Analyzers for 'Black Carbon' Aerosol Particles Real-time Measurement in Ambient Air |
| 5. | Environmental Protection Department via EMISSA Inc., Greece (HKEPD/13-01593) | 2013-12 to 2014-12 (Completed) | \$136,105 | Principal Investigator | Provision of Service for Evaluation of Methodologies for New Generation Vehicle Emission Model |

Conference/workshop/symposium attended

| Presentation/Poster Title | Conference Name | Location | Date of attendance |
|---|---|------------------------------------|--------------------|
| A novel approach for online measurement of stable carbon isotope ratio of carbonaceous atmospheric aerosols | EAC2015 - European Aerosol Conference | Milan, Italy | Sep 6 to 11, 2015 |
| Next generation air sensing for urban air quality management and public exposure | 4th ANCST International Conference: Climate change and urban environment | Beijing, China | Jul 15-17, 2015 |
| Tandem of OC-EC and CCIA for Stable Isotopic Ratio Measurement of Aerosol Carbon | 9 th Asian Aerosol Conference, 2015 | Komatsu, Japan | Jun 24-28, 2015 |
| Development and application of open source air sensor platforms for assessment of urban traffic pollutant exposure | Workshop on Comparison of Air Pollution in Transportation Environments (CAPTEN) | Raleigh, NC, US (video conference) | Jun 19-20, 2015 |
| Black Carbon Size Distribution and Mixing State in Urban Environments | Workshop on Atmospheric Chemistry and Climate Change in Asia (WACCCA2014) | Malaysia | Jul, 14-15, 2014 |
| Particle bound black carbon size distribution and mixing state in urban environments using a novel tandem differential mobility analyzer and aethalometer | EGU General Assembly 2013 | Vienna, Austria | Apr, 7-12, 2013 |
| Particulate matter (PM) concentrations in underground and ground-level rail systems of the Los Angeles Metro | 7 th Asian Aerosol Conference, 2013 | Xi'an, China | Aug 17-19, 2011 |
| Comparison of particle sampling and collection methods for measurement of their physicochemical and toxicological properties | American Association for Aerosol Research (AAAR) 29th Annual Conference | Portland, OR | Oct 25-29, 2010 |
| Characterization of Particle Bound Organic Carbon from Diesel Vehicles Equipped with Advanced Emission Control Technologies | American Association for Aerosol Research (AAAR) 28th Annual Conference | Minneapolis, MN | Oct 26-30, 2009 |
| Light- and Heavy-Duty Vehicle Emission Factors of PM Species Based on Freeway Measurements and Comparison with Tunnel | American Association for Aerosol Research (AAAR) 27th Annual Conference | Orlando, Florida | Oct 20-24, 2008 |

and Dynamometer Studies

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|--|---|------------------|------------------|
| Physical and Chemical Properties Particles Emitted from Heavy Duty Diesel Vehicles Operating with Advanced Emission Control Technologies | Air and Waste Management Association (A&WMA) 101st Annual Conference & Exhibition | Portland, Oregon | Jun 24-26, 2008 |
| Daily Variation in Chemical Characteristics of Urban Ultrafine Aerosols and Inference of Their Sources | American Association for Aerosol Research 26th Annual Conference | Reno, Nevada | Sep 24–28, 2007. |
| Characterization of On-Road Vehicle Emissions in Hong Kong | Seventh Asia-Pacific International Symposium on Combustion & Energy Utilization (7th APISCEU) | Hong Kong | Dec 15-17, 2004. |

Invited talks/Keynote speak invitation

| Talk title | Event | Inviting institution | Location | Date |
|---|--|---|---|----------------|
| Urban vehicle emission measurement methods and next generation sensing application | Foreign Expert Bureau sponsored Academic Exchange | Shanghai Environmental Monitoring Center | Shanghai, China | Aug, 10, 2015 |
| The air sensing and application in urban air quality management | The 1 st Environmental IT and Big data Summit of China | <i>Beijing Tsinghua</i> Industrial R&D Institute (BTIRDI) | Beijing, China | May, 27, 2015 |
| Urban aerosol and air pollution measurement | The 19th TSI Aerosol Seminar | Key Laboratory of Aerosol Chemistry and Physics, CAS | Xi'an China | Apr, 15, 2015 |
| Next generation air sensing and application for air quality monitoring in the age of IoT | Open Data and Citizen Science Reporting – Potential for Air Quality Monitoring | Hong Kong Efficiency Unit, HKSAR | Hong Kong | Dec, 9, 2014 |
| Evidence based research on urban emission control | Chengdu Air Pollution International Seminar | Chengdu Research Institute of Environmental Protection | Chengdu, China | Nov, 28, 2014 |
| Fleet based on - road vehicle emissions from real world measurement and emission control policy implications | MoVE 2014 | Hong Kong Environmental Protection Department | Hong Kong | June, 27, 2014 |
| Transport, roadside air pollution and pedestrian exposure | Public Forum on Transport Management | Friends of the Earth | Hong Kong | June, 28, 2014 |
| Low cost sensor development and application for community air monitoring and personal exposures assessment in Hong Kong | USEPA Air Sensor workshop | USEPA | Video conference in Chapel Hill, NC, US | June, 09, 2014 |
| Air pollution in Hong Kong is bad, too | HSBC Investor Lunch Forum | Climate Change Strategy, Asia-Pacific, The | Central, Hong Kong | May 23, 2014 |

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| Fleet based on - road vehicle emissions from real world measurement and their impact on roadside air quality | Evidence-based Control Measures Improving Air Quality in HK, Stakeholder's Engagement Seminar | Hong Kong Environmental Protection Department | Hong Kong | May , 14, 2014 |
| Impact of transportation fuel usage on urban air quality and public exposure: a case study in Hong Kong, | Public Forum on Exploring Alternative Fuel Vehicles in Hong Kong: Liquefied Natural Gas | EMAHK (香港環境管理協會) | Hong Kong | Mar, 1, 2014 |
| The walkable urban environment and pedestrian exposure | Walkable City, Living Streets, Conference | Civic Exchange | Hong Kong | May, 07, 2013 |
| An integrated approach for CO ₂ emission management combining measurement and modeling | Research Seminar on Greenhouse Gases | Institute of Tropical and Marine Meteorology, China Meteorological Administration | Guangzhou , China | Jan 25, 2013 |
| Urban Air Pollution: Sources and Health Impacts | Academic Exchange | Department of Thermal Science and Energy Engineering, University of Science and Technology of China | Hefei, China. | July, 7, 2012. |
| Urban PM _{2.5} air pollution and their impact on public health | The International Conference on Remote Sensing, Environment and Transport Engineering 2012 (RSETE) | Nanjing Section GRS Chapter | Nanjing, China | Jun, 2, 2012. |
| A new methodology of measuring vehicle emissions from blended diesel" | IMechE (HK) Symposium "Advanced Technology in Energy Systems for a Quality Environment". | IMechE (HK) | Hong Kong | Mar, 21, 2012. |

Patent:

1. Multi-application high flow aerosol to hydrosol PM_{2.5} sampler, PWG/PA/302/7/2012 (PRC)
2. Dispersive Infrared Spectroscopy Measurements of Atmospheric CO₂, PWG/PA/357/10/2013 (PRC, US)

Knowledge Licensing:

1. On-road plume chasing and analysis system (OPCAS). Non-exclusive technology licensed to Hang Zhou Fuming Huanke Corporation, Aug 2013
2. Next generation air sensing. Shenzhen Chuanglong Qingyan Ltd., Aug, 2015

AWARDS

1. Excellent Product Award, China Hi-Tech Fair, 16-21, November, 2013, Shenzhen, China
2. Excellence in reviewing, Elsevier, May 2013

News articles

Transform Des Voeux Road into pedestrian-tram green zone, Hong Kong planners urge, 20 August, 2015,

- <http://www.scmp.com/news/hong-kong/article/1499424/joint-study-proposes-vehicle-ban-cleaner-air-des-voies-road-central>
- CityU develops cutting-edge air monitoring sensor package, 2015-02-10
- <http://paper.wenweipo.com/2015/02/10/ED1502100009.htm>
 - <http://std.stheadline.com/yesterday/edu/0210go03.html>
 - http://orientaldaily.on.cc/cnt/news/20150210/00176_062.html
 - <http://life.mingpao.com/cfm/dailynews3b.cfm?File=20150210/nalگو/god1.txt>
- Pollution sensors to line Hong Kong marathon route, 2015-01-24
- <http://www.scmp.com/news/hong-kong/article/1690204/pollution-sensors-line-hong-kong-marathon-route>
- Walkability and Pedestrianisation in Central, 2014-04-29
- Interview by RTHK Radio 3 “Backchat” programme on research in Central
- Masses of Mercedes Thicken Hong Kong Pollution, 2014-04-28
- <http://www.bloomberg.com/news/articles/2014-04-15/masses-of-mercedes-thicken-hong-kong-air-pollution-mess> Bloomberg news report on Hong Kong Air Pollution
- Excellent Product Award for "Aerosol to Hydrosol Air Sampler", China Hi-tech Exhibition, Shenzhen, China, 2013-11
- [香港城大展出创新多功能便携式空气悬浮粒子 PM2.5 及病菌采样器](#)
 - <http://finance.sina.com.cn/roll/20131118/035017349463.shtml> 高交会：力拓科技成果产业化之路
 - [【新浪财经】高交会：力拓科技成果产业化之路](#)
- Invisible killer in the air. 2012-08-12
- [Interview by RTHK TV program "Hong Kong connections 铿锵集"](#)
- CityU develops Hong Kong's first plume chasing system to monitor vehicle emissions, Feb 23, 2012.
- http://paper.takungpao.com/html/2012-02/04/content_13_2.htm (Ta Kung Pao)
 - <http://paper.wenweipo.com/2012/02/04/HK1202040016.htm> (Wen Wei Pao)

RESEARCH EXPERIENCE

| | | |
|--------------------|------------------------------|---|
| 2011/07 to present | Assistant Professor | City University of Hong Kong, Hong Kong |
| 2009/12 to 2011/05 | Research Assistant Professor | University of Southern California, Los Angeles, CA |
| 2010/08 to 2010/09 | Collaborative researcher | Max-Planck Institute of Chemistry, Mainz, Germany |
| 2009/06 to 2009/07 | Collaborative researcher | Laboratoire des sciences du climat et de l'environnement (LSCE), Paris |
| 2007/11 to 2007/12 | Collaborative researcher | National Institute for Occupational Safety and Health (NIOSH), Pittsburgh |

JOURNAL PUBLICATIONS

1. Brimblecombe P., Townsend T., Lau C.F., Rakowska A., Chan T.L., Močnik G., **Ning Z***. Through-tunnel estimates of vehicle fleet emission factors (2015). *Atmospheric Environment*, 123, pp. 180-189. DOI: 10.1016/j.atmosenv.2015.10.086
2. Lau C.F., Rakowska A., Townsend T., Brimblecombe P., Chan T.L., Yam Y.S., Močnik G., **Ning Z***. Evaluation of diesel fleet emissions and control policies from plume chasing measurements of on-road vehicles (2015) *Atmospheric Environment*, 122, pp. 171-182. DOI: 10.1016/j.atmosenv.2015.09.048
3. Jiang Sabrina Yanan, Kaul Daya S, Yang Fenhuan, Sun Li, **Zhi Ning*** (2015)"Source apportionment and water solubility of metals in size segregated particles in urban environments." *Science of The Total Environment* 533(0): 347-355.
4. K.L. Chan, A. Hartl, Y.F. Lam, P.H. Xie, W.Q. Liu, H.M. Cheung, J. Lampel, D. Pöhler, A. Li, J. Xu, H.J. Zhou, **Z. Ning**, M.O. Wenig, 2015, Observations of tropospheric NO₂ using ground based MAX-DOAS and OMI measurements during the Shanghai World Expo 2010, *Atmospheric Environment*, Volume 119, October 2015, Pages 45–58
5. Peter Brimblecombe, **Zhi Ning**. Effect of road blockages on local air pollution during the Hong Kong protests and its implications for air quality management. *Science of The Total Environment*. 2015 Jul 31;536:443-448. doi: 10.1016/j.scitotenv.2015.07.104
6. Sabrina Yanan Jiang, Daya S. Kaul, Fenhuan Yang, Li Sun, **Zhi Ning***, Source apportionment and water solubility of metals in size segregated particles in urban environments, *Science of The Total Environment*, Volume 533, 15 November 2015, Pages 347-355, ISSN 0048-9697, <http://dx.doi.org/10.1016/j.scitotenv.2015.06.146>.
7. Fenhuan Yang, Daya Kaul, Ka Chun Wong, Dane Westerdahl, Li Sun, Kin-fai Ho, Linwei Tian, Peter Brimblecombe, **Zhi Ning***, Heterogeneity of passenger exposure to air pollutants in public transport microenvironments, *Atmospheric Environment*, Volume 109, Pages 42–51, DOI: 10.1016/j.atmosenv.2015.03.009.
8. X. J. Man, C. S. Cheung, **Z. Ning** & K. F. Yung (2015): Effect of Waste Cooking Oil Biodiesel on the Properties of Particulate from a DI Diesel Engine, *Aerosol Science and Technology*, Vol. 49, Iss. 4, Page 199-209. 2015, DOI: 10.1080/02786826.2015.1016214

9. Wubulihairen Maimaitireyimu, Sabrina, Yanan Jiang, **Zhi Ning***, Prototype Development and Laboratory Evaluation of an Aerosol to Hydrosol Sampler. *Aerosol and Air Quality Research*, Volume 15, No. 3, June 2015, Pages 776-785, doi: 10.4209/aaqr.2014.08.0175
10. Wubulihairen Maimaitireyimu, **Zhi Ning***, Xiaoying Lu, Patrick K.H Lee. Development and laboratory evaluation of a compact swirling aerosol sampler (SAS) for collection of atmospheric bioaerosols. *Atmospheric Pollution Research*, Vol 6, Iss 4, doi: 10.5094/APR.2015.062
11. Nirmal Kumar Gali, Fenhuan Yang, Sabrina Yanan Jiang, Ka Lok Chan, Li Sun, Kin-fai Ho, **Zhi Ning***, Spatial and seasonal heterogeneity of atmospheric particles induced reactive oxygen species in urban areas and the role of water-soluble metals, *Environmental Pollution*, 2015, 198:86-96, doi: 10.1016/j.envpol.2015.01.001
12. Longhua Hu, Xiaochun Zhang, Wei Zhu, **Zhi Ning**, Fei Tang, A global relation of fire smoke re-circulation behavior in urban street canyons, 2015. *Journal of Civil Engineering and Management*, (IF=2.016), Vol. 21, Iss. 4, 459-469.
13. Agata Rakowska, Ka Chun Wong, Dane Westerdahl, Thomas Townsend, Ka Lok Chan, Simon Ng, Griša Močnik, Luka Drinovec, **Zhi Ning***, Impact of traffic volume and composition on the air quality and pedestrian exposure in urban street canyon. *Atmospheric Environment*, Volume 98, December 2014, Pages 260–270. DOI: 10.1016/j.atmosenv.2014.08.073
14. Y.C. Lee, D.T. Shindell, G. Faluvegi, M. Wenig, Y.F. Lam, **Z. Ning**, S. Hao, C.S. Lai, Increase of ozone concentrations, its temperature sensitivity and the precursor factor in South China, *Tellus B* 2014, 66, 23455, <http://dx.doi.org/10.3402/tellusb.v66.23455>
15. Jiang, S.Y.N., Yang, F., Chan, K.L., **Ning, Z.***, 2014. Water solubility of metals in coarse PM and PM2.5 in typical urban environment in Hong Kong. *Atmospheric Pollution Research*, 5: 236- 244, doi: 10.5094/APR.2014.029.
16. K. L. Chan, **Z. Ning***, D. Westerdahl, K. C. Wong, Y. W. Sun, A. Hartl, M. O. Wenig. Dispersive Infrared Spectroscopy Measurements of Atmospheric CO₂ using a Fabry-Perot Interferometer Sensor. *Science of the Total Environment* (IF: 3.258), 472, Pages 27–35. 2013. doi: 10.1016/j.scitotenv.2013.10.105
17. **Ning, Z.***, K. L. Chan, K. C. Wong, D. Westerdahl, G. Močnik, J. H. Zhou and C. S. Cheung, Black carbon mass size distributions of diesel exhaust and urban aerosols measured using differential mobility analyzer in tandem with Aethalometer. 2013. *Atmospheric Environment*, Volume 80, December 2013, Pages 31–40, DOI: 10.1016/j.atmosenv.2013.07.037 (IF=3.787)
18. Y.C. Lee, Y.F. Lam, G. Kuhlmann, M.O. Wenig, K.L. Chan, A. Hartl, **Zhi Ning***. An integrated approach to identify the biomass burning sources contributing to black carbon episodes in Hong Kong, *Atmospheric Environment*, 2013. (IF=3.787), Volume 80, December 2013, Pages 478–487
19. Li, R. S., M. Navab, P. Pakbin, **Z. Ning**, K. Navab, G. Hough, T. E. Morgan, C. E. Finch, J. A. Araujo, A. M. Fogelman, C. Sioutas and T. Hsiai, Ambient ultrafine particles alter lipid metabolism and HDL anti-oxidant capacity in LDLR-null mice. *Journal of Lipid Research* 54(6), 1608-1615. (IF=5.559)
20. **Ning, Z.***, Wubulihairen, R., F. Yang. PM, NO_x and butane emissions from on-road vehicle fleets in Hong Kong and their implications on emission control policy, *Atmospheric Environment*, 2012 61: 265-274. Impact factor: 3.4650
21. Kam, W., **Ning, Z.**, Schauer, J. J., Shafer, M., Sioutas, C. Chemical characterization of coarse and fine particulate matter (PM) in underground and ground-level rail systems of Los Angeles Metro, *Environmental Science & Technology*, 2011, 45(16):6769-76 .
22. Daher, N., **Ning, Z.**, Cho, A.K., Shafer M. M., Schauer, J. J., Sioutas, C. Comparison of the chemical and toxicological characteristics of particulate matter (PM) collected by different methods: filters, impactors and BioSamplers, *Aerosol Science and Technology*, 2011, 45: 11, 1294-1304.
23. Cheung, K; Daher, N; Shafer, MM; **Ning, Z.** Schauer, JJ. Sioutas, C. Diurnal trends in coarse particulate matter composition in the Los Angeles Basin. *Journal of Environmental Monitoring*, 2011, 13: 11, 3277-3287.
24. Cheung, K.; Daher, N.; Kam, W., Shafer, MM., **Ning, Z.** Schauer, JJ. Sioutas, C. Spatial and temporal variation of chemical composition and mass closure of ambient coarse particulate matter (PM(10-2.5)) in the Los Angeles area. *Atmospheric Environment*, 2011. 45:16, 2651-2662
25. Morgan, T.E, Davis, D.A, Iwata, N., Tanner, J.A, Snyder, D., **Ning, Z.**, Kam, W., Hsu, Y.T, Winkler, J.W, Chen, J.C, Petasis, N.A, Baudry, M., Sioutas, C., and Finch, C.E. “Glutamatergic neurons in rodent models respond to nanoscale particulate urban air pollutants in vivo and in vitro”. *Environmental Health Perspectives*, 119(7): 1003–1009. August 2010
26. Pakbin, P., **Ning, Z.**, Shafer, M.M., Schauer J.J., Sioutas C. Seasonal and Spatial Coarse Particle Elemental Concentrations in the Los Angeles Area, *Atmospheric Environment*, 45:8, pp. 949-963, March 2011.
27. Payam Pakbin, **Zhi Ning**, Arantzazu Eiguren-Fernandez, Constantinos Sioutas, Modification of the Versatile Aerosol Concentration Enrichment System (VACES) for conducting inhalation exposures to semi-volatile vapor phase pollutants. *Journal of Aerosol Science* 01/2011; 42(9):555-566.
28. **Ning, Z.**, Hudda, N., Daher, N., Kam W., Herner, J, Kozawa, K., Mara, S., Sioutas C. Impact of roadside noise barriers on particle size distributions and pollutants concentrations near freeways, *Atmospheric Environment*. 44:26, 3118-3127, 2010
29. **Ning, Z.**, Sioutas, C. Atmospheric processes influencing aerosols generated by combustion and their impact on public exposure: A Review. *Aerosol and Air Quality Research*. 10: 43–58, 2010.
30. Li R., **Ning, Z.**, Cui, J., Sioutas, C., Hsiai T., Diesel exhaust particles modulate vascular endothelial cell permeability: Implication of ZO-1 Expression, *Toxicology Letters* 197: 163–168, 2010.

31. Li R., **Ning, Z.**, Majumdar R., Cui, J., Takabe, W., Jen, N., Sioutas, C. and Hsiai T., Ultrafine particles from diesel vehicle emissions at different driving cycles induce differential vascular pro-inflammatory responses: Implication of chemical components and NF- κ B signaling, *Particle and Fibre Toxicology*, 7:6, doi:10.1186/1743-8977-7-6, 2010
32. Ning Li, Jack R Harkema, Ryan P Lewandowski, Meiyang Wang, Lori A Bramble, Glenn R Gookin, **Zhi Ning**, Michael T Kleinman, Constantinos Sioutas, Andre E Nel, Ambient ultrafine particles provide a strong adjuvant effect in the secondary immune response: implication for traffic-related asthma flares. *AJP Lung Cellular and Molecular Physiology*. 2010; 299(3):L374-83.
33. Verma, V., **Ning, Z.**, Cho A. K., Schauer J. J., Shafer M. M. and Sioutas C. Redox activity of urban quasi-ultrafine particles from primary and secondary sources. *Atmospheric Environment*, Volume 43, Issue 40, December 2009, Pages 6360-6368
34. Han, B., **Ning, Z.**, Hudda, N., Kim, Y. J., Sioutas, C. Efficient Collection of Atmospheric Aerosols with a Particle Concentrator—Electrostatic Precipitator Sampler, *Aerosol Science and Technology*, 43:757-766, 2009
35. **Ning, Z.**, Silanpaa, M., Pakbin, P., Sioutas, C., Field evaluation of a new particle concentrator- electrostatic precipitator system for measuring chemical and toxicological properties of particulate matter, *Particle and Fibre Toxicology*, 2008, 5:15, November 2008
36. Pakbin, P., **Ning, Z.**, Schauer J. J., Sioutas, C. Characterization of Particle Bound Organic Carbon from Diesel Vehicles Equipped with Advanced Emission Control Technologies, *Environmental Science and Technology*, 2009, 43 (13), pp 4679–4686
37. Li R., **Ning, Z.**, Cui J., Khalsa B., Ai L., Takabe W., Beebe T., Majumdar R., Sioutas C., and Hsiai T. “Ultra Fine Particles From Diesel Engines Induce Vascular Oxidative Stress via JNK Activation”. *Free Radical Biology and Medicine*, Volume 46, Issue 6, 15 March 2009, Pages 775-782, doi:10.1016/j.freeradbiomed.2008.11.025
38. Han, B., Hudda, N., **Ning, Z.**, Kim, H. J., Kim, Y. J. & Sioutas, C. (2008). A novel bipolar charger for submicron aerosol particles using carbon fiber ionizers, *Journal of Aerosol Science*, 40(4), April 2009, Pages 285-294.
39. Han, B., Hudda N., **Ning, Z.** and Sioutas C. Enhanced Unipolar Charging of Concentration-Enriched Particles Using Water-based Condensational Growth. *Journal of Aerosol Science*, 39 (9), September 2008, Pages 770-78
40. **Ning, Z.**, Polidori, A., Schauer, J.J. and Sioutas C. Emission factors of PM species based on freeway measurements and comparison with tunnel and dynamometer studies. *Atmospheric Environment*, Volume 42, Issue 13, April 2008, Pages 3099-3114
41. **Ning, Z.**, Geller M.D. and Sioutas C, Fine, Ultrafine and Nanoparticle Trace Organic Composition Near a Major Freeway With Heavy Duty Diesel Fraction, *Society of Automotive Engineers*, 2007-24-0108 , July 2007
42. **Ning, Z.**, Geller M.D., Moore K.F, Sheesley R.J., Schauer J.J, and Sioutas C. Daily Variation of Chemical Characteristics of Urban Ultrafine Aerosols and Inference of their Sources. *Environmental Science and Technology*, 41 (17), 6000-6006, 2007
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44. Ntziachristos L, **Ning, Z.**, Geller M.D., Sheesley R., Schauer J.J. and Sioutas C. Fine, Ultrafine and Nanoparticles Trace Element Compositions near a Freeway with Heavy Duty Diesel Traffic. *Atmospheric Environment*, 41 (27): 5684 – 5696, 2007
45. Ntziachristos L., **Ning, Z.**, Geller M.D and Sioutas C. Particle Concentration and Characteristics near a Major Freeway with Heavy-Duty Diesel Traffic. *Environmental Science and Technology* 41 (7), 2223 -2230, 2007.
46. **Ning, Z.**, Moore K., Polidori A, Siouats C. Field Validation of the new miniature Versatile Aerosol Concentration Enrichment System (mVACES). *Aerosol Science and Technology* 40 (12), 1098-1110, 2006
47. **Ning, Z.** and Chan, T.L. On-road Remote Sensing of Liquefied Petroleum Gas (LPG) Vehicle Emissions Measurement and Emission Factors Estimation in Hong Kong. *Atmospheric Environment*, Volume 41, Issue 39, Pages 9099-9110, 2007
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49. Wang, J.S, Chan, T.L., **Ning, Z.**, Cheung C.S., Leung C.W. Roadside Measurement and Prediction of CO and PM_{2.5} Dispersion from On-road Vehicles in Hong Kong. *Transportation Research Part D- Transport and Environment* 11 (4): 242-249, 2006
50. Chan T.L. and **Ning Z.** (2005) On-road Remote Sensing of Diesel Vehicle Emissions Measurement and Emission Factors Estimation in Hong Kong. *Atmospheric Environment* 39 (36): 6843-6856, 2005
51. Chan T.L., **Ning Z.**, Leung C.W., Cheung C.S., Hung W.T. and Dong G. On-road Remote Sensing of Petrol Vehicle Emissions Measurement and Emission Factors Estimation in Hong Kong. *Atmospheric Environment* 38(14), 2055-2066, 2004

Conference/workshop/symposium attended

| Presentation/Poster Title | Conference Name | Location | Date of attendance |
|--|---------------------------------------|--------------|--------------------|
| A novel approach for online measurement of stable carbon isotope ratio of carbonaceous | EAC2015 - European Aerosol Conference | Milan, Italy | Sep 6 to 11, 2015 |

| atmospheric aerosols | | | |
|---|---|------------------------------------|------------------|
| Next generation air sensing for urban air quality management and public exposure | 4th ANCST International Conference: Climate change and urban environment | Beijing, China | Jul 15-17, 2015 |
| Tandem of OC-EC and CCIA for Stable Isotopic Ratio Measurement of Aerosol Carbon | 9 th Asian Aerosol Conference, 2015 | Komatsu, Japan | Jun 24-28, 2015 |
| Development and application of open source air sensor platforms for assessment of urban traffic pollutant exposure | Workshop on Comparison of Air Pollution in Transportation Environments (CAPTEN) | Raleigh, NC, US (video conference) | Jun 19-20, 2015 |
| Black Carbon Size Distribution and Mixing State in Urban Environments | Workshop on Atmospheric Chemistry and Climate Change in Asia (WACCCA2014) | Malaysia | Jul, 14-15, 2014 |
| Particle bound black carbon size distribution and mixing state in urban environments using a novel tandem differential mobility analyzer and aethalometer | EGU General Assembly 2013 | Vienna, Austria | Apr, 7-12, 2013 |
| Particulate matter (PM) concentrations in underground and ground-level rail systems of the Los Angeles Metro | 7 th Asian Aerosol Conference, 2013 | Xi'an, China | Aug 17-19, 2011 |
| Comparison of particle sampling and collection methods for measurement of their physicochemical and toxicological properties | American Association for Aerosol Research (AAAR) 29th Annual Conference | Portland, OR | Oct 25-29, 2010 |
| Characterization of Particle Bound Organic Carbon from Diesel Vehicles Equipped with Advanced Emission Control Technologies | American Association for Aerosol Research (AAAR) 28th Annual Conference | Minneapolis, MN | Oct 26-30, 2009 |
| Light- and Heavy-Duty Vehicle Emission Factors of PM Species Based on Freeway Measurements and Comparison with Tunnel and Dynamometer Studies | American Association for Aerosol Research (AAAR) 27th Annual Conference | Orlando, Florida | Oct 20-24, 2008 |
| Physical and Chemical Properties Particles Emitted from Heavy Duty Diesel Vehicles Operating with Advanced Emission Control Technologies | Air and Waste Management Association (A&WMA) 101st Annual Conference & Exhibition | Portland, Oregon | Jun 24-26, 2008 |
| Daily Variation in Chemical Characteristics of Urban Ultrafine Aerosols and Inference of Their Sources | American Association for Aerosol Research 26th Annual Conference | Reno, Nevada | Sep 24-28, 2007. |
| Characterization of On-Road Vehicle Emissions in Hong Kong | Seventh Asia-Pacific International Symposium on Combustion & Energy Utilization (7th APISCEU) | Hong Kong | Dec 15-17, 2004. |

Invited talks/Keynote speak invitation

| Talk title | Event | Inviting institution | Location | Date |
|---|---|--|---|----------------|
| Urban vehicle emission measurement methods and next generation sensing application | Foreign Expert Bureau sponsored Academic Exchange | Shanghai Environmental Monitoring Center | Shanghai, China | Aug, 10, 2015 |
| The air sensing and application in urban air quality management | The 1 st Environmental IT and Big data Summit of China | <i>Beijing Tsinghua</i> Industrial R&D Institute (BTIRDI) | Beijing, China | May, 27, 2015 |
| Urban aerosol and air pollution measurement | The 19th TSI Aerosol Seminar | Key Laboratory of Aerosol Chemistry and Physics, CAS | Xi'an China | Apr, 15, 2015 |
| Next generation air sensing and application for air quality monitoring in the age of IoT | Open Data and Citizen Science Reporting – Potential for Air Quality Monitoring | Hong Kong Efficiency Unit, HKSAR | Hong Kong | Dec, 9, 2014 |
| Evidence based research on urban emission control | Chengdu Air Pollution International Seminar | Chengdu Research Institute of Environmental Protection | Chengdu, China | Nov, 28, 2014 |
| Fleet based on - road vehicle emissions from real world measurement and emission control policy implications | MoVE 2014 | Hong Kong Environmental Protection Department | Hong Kong | June, 27, 2014 |
| Transport, roadside air pollution and pedestrian exposure | Public Forum on Transport Management | Friends of the Earth | Hong Kong | June, 28, 2014 |
| Low cost sensor development and application for community air monitoring and personal exposures assessment in Hong Kong | USEPA Air Sensor workshop | USEPA | Video conference in Chapel Hill, NC, US | June, 09, 2014 |
| Air pollution in Hong Kong is bad, too | HSBC Investor Lunch Forum | Climate Change Strategy, Asia-Pacific, The Hongkong and Shanghai Banking Corporation Limited | Central, Hong Kong | May 23, 2014 |
| Fleet based on - road vehicle emissions from real world measurement and their impact on roadside air quality | Evidence-based Control Measures Improving Air Quality in HK, Stakeholder's Engagement Seminar | Hong Kong Environmental Protection Department | Hong Kong | May , 14, 2014 |
| Impact of transportation fuel usage on urban air quality and public exposure: a case study in Hong Kong, | Public Forum on Exploring Alternative Fuel Vehicles in Hong Kong: Liquefied Natural Gas | EMAHK (香港環境管理協會) | Hong Kong | Mar, 1, 2014 |
| The walkable urban environment and pedestrian | Walkable City, Living Streets, Conference | Civic Exchange | Hong Kong | May, 07, 2013 |

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|---|--|---|------------------|----------------|
| exposure | | | | |
| An integrated approach for CO ₂ emission management combining measurement and modeling | Research Seminar on Greenhouse Gases | Institute of Tropical and Marine Meteorology, China Meteorological Administration | Guangzhou, China | Jan 25, 2013 |
| Urban Air Pollution: Sources and Health Impacts | Academic Exchange | Department of Thermal Science and Energy Engineering, University of Science and Technology of China | Hefei, China. | July, 7, 2012. |
| Urban PM _{2.5} air pollution and their impact on public health | The International Conference on Remote Sensing, Environment and Transport Engineering 2012 (RSETE) | Nanjing Section GRS Chapter | Nanjing, China | Jun, 2, 2012. |
| A new methodology of measuring vehicle emissions from blended diesel” | IMechE (HK) Symposium "Advanced Technology in Energy Systems for a Quality Environment". | IMechE (HK) | Hong Kong | Mar, 21, 2012. |

International Journal Reviewer since 2011:

- Aerosol and Air Quality Research;
- Atmospheric Chemistry and Physics Discussion.
- Applied Energy
- [Atmospheric Environment*](#);
- Atmospheric Pollution Research;
- Atmospheric Research;
- Environmental Engineering Science
- Environmental Science and Pollution Research;
- Environmental Science and Technology;
- Indoor and Built Environment

* Awarded for Excellence in reviewing by Atmospheric Environment, Elsevier in May 2013

International Grant Review since 2011:

- European Research Council (ERC), ERC Starting Grant – 2015, reviewed in Mar, 2015.
- Evaluation of European ACTRIS proposal: SMR4, reviewed in Mar, 2013
- Evaluation of European ACTRIS proposal: SMR5, reviewed in Mar, 2013
- Evaluation of European ACTRIS proposal: TNA FKL-5, reviewed in Apr, 2012
- Evaluation of European ACTRIS proposal: CESAR, reviewed in Sep, 2011

Journal Editor since 2014:

- Associate Editor for “Frontiers in Environmental Science: Special topics on transport emissions”, 2014-present
- Associate Editor for “The Hong Kong Institution of Engineers (HKIE) Transactions: Mechanical Engineering Discipline”, 2015-present

TAUGHT COURSES

School of Energy and Environment, City University of Hong Kong

- SEE4211 Air Pollution (Undergraduate)
- SEE4213 An Introduction to Environmental Data Analysis (Undergraduate)
- SEE5211 Data Analysis in Environmental Applications (Postgraduate)
- SEE5212 / SEE8220 Air Pollution Measurement Theories and Techniques (Postgraduate)

Department of Civil and Environmental Engineering, University of Southern California

- ENE526 Particulate Air Pollutants: Properties, Behavior and Measurement (Postgraduate);

Ph.D students under my supervision

| Student Name | Type | Year of admission | Thesis title | Current status |
|-------------------------------------|--|-------------------|---|-----------------------------|
| 1. Dr. Agata Rakowska | RGC quote | 2012 | Physicochemical evolution of air pollutants from traffic emissions to roadside in complex built environments. | Graduated in 2015-03 |
| 2. Dr. Ka lok Chan | RGC quote | 2012 | Developments and applications of optical absorption spectroscopic measurement techniques atmospheric trace constituent detection and monitoring | Graduated in 2015-04 |
| 3. Mr. Wubulihai ren Maimaitireyimu | RGC quote | 2012 | Development, evaluation and application of aerosol to hydrosol sampling technique | Thesis submitted in 2015-08 |
| 4. Mr. Ka Chun Wong | RGC quote | 2013 | Understanding atmospheric processes from high time resolution air quality data in near source environment | On-going |
| 5. Miss Yannan Sabrina Jiang | RGC quote | 2014 | Does the Transformation of Iron Species Happen in Particulate Matters in Urban Atmosphere? | On-going |
| 6. Mr. Guoliang Li | RGC quote | 2015 | Black carbon in urban atmosphere: size and coating from near-source to ambient environment | On-going |
| 7. Miss Qian Zhang | Joint PhD with Xi'an Jiaotong University | 2015 | Brown carbon characterization and optical properties in urban air | On-going |

Research student co-supervision and external dissertation examination

| Student Name | Degree | University | My Role | Thesis title | Current status |
|---|--------|--|-------------------|--|------------------------------|
| Miss Vivian Lai (Supervisor Dr. Audrey de Nazelle) | MSc | Centre for Environmental Policy, Imperial College London | Co-supervisor | Particulate Matter mass and size distribution in air pollution of different public transport modes in Hong Kong (HK) | Thesis defended in Oct, 2013 |
| Dr. Panu Karjalainen (Supervisor Prof. Keskinen Jorma) | Ph.D | Faculty of Natural Sciences, Tampere University of Technology, Finland | External examiner | Vehicle Exhaust Nanoparticles Under Transient Driving Conditions | Thesis defended in Nov, 2014 |
| Dr. ZHOU | Ph.D | Department of | Co-supervisor | Combustion and Emissions | Thesis |

| | | | | | |
|---|-------|--|-------------------|--|----------------------------------|
| Jianhao (Supervisor Prof. C.S Cheung) | | Mechanical Engineering, The Hong Kong Polytechnic University | | of a Diesel Engine with Hydrogen Addition | defended on 2014, Oct, 28 |
| Dr. WU Cheng (Supervisor Prof. Jianzhen YU) | Ph.D | Department of Chemistry & Division of Environment Hong Kong University of Science & Technology | External examiner | Ambient Characteristics of Black carbon and Elemental Carbon in the Pearl River Delta and the Application of Elemental Carbon as a Combustion Aerosol Tracer | Thesis defended on 2015, Jan, 22 |
| Dr. Ali Mohammad Pourkhesalian (Supervisor Prof. Lidia Morawska) | Ph.D | Faculty of Science and Engineering, Queensland University of Technology, Australia | External examiner | Effects of biodiesel chemical composition on the chemical and physical properties of the primary and secondary diesel particulate matter | Thesis defended in Feb, 2015 |
| Dr. ZHA Qiaozhi (Supervisor Prof. WANG Tao) | MPhil | Department of Civil and Environmental Engineering, The Hong Kong Polytechnic University | External examiner | Measurement of Nitrous Acid (HONO) and the Implications to Photochemical Pollution | Thesis defended on 2015, Jul, 22 |