



Xiangrui Kong

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Current Employments

- Faulty Researcher** 2018 -
University of Gothenburg, Gothenburg, Sweden
- Wisteria Distinguished Experts, Adjunct Professor** 2018 -
Northwest University, Xi'an, China

Research Experience

- Postdoc** 2015 - 2017
Paul Scherrer Institute, Villigen, Switzerland
Focus: Synchrotron-based photoelectron spectroscopy in a Near Ambient Pressure Photoemission (NAPP) end station, for both solid chamber and liquid jet.
Budget responsibility: SEK 2,100,000
- Visiting Scientist** 2016 summer & 2017 summer
Massachusetts Institute of Technology, Cambridge, MA, USA
Focus: Innovative study of sea salt particle phase change by an online continuous flow diffusion chamber.
- Researcher** 8/2017 -12/2017
University of Oulu, Oulu, Finland
Focus: Synchrotron-based Atmospheric Research.
- Visiting Scientist** 7/2014 - 12/2014
Czech Academy of Science, Prague, Czech Republic
Focus: Molecular dynamics simulation.

Education

- Ph.D in Chemistry**
University of Gothenburg, Sweden, 2014
Dissertation title: "Molecular Investigations of Atmospherically Relevant Interface Processes: Ice Formation and Water Accommodation on Ice and Organic Surfaces"
Supervisor: Prof. Jan Pettersson
- Licentiate in Chemistry**
University of Gothenburg, Sweden, 2013
Thesis: "Interaction of Water and Alcohols under Conditions Relevant to the Upper Troposphere"
- Master of Science (Environmental Measurements and Assessments)**
Chalmers University of Technology, Sweden, 2009
Thesis: "Clustering Analysis for Alkali-containing Aerosol Particles: Influence of Meteorological Conditions"

Granted Funding

- The Swedish Foundation for International Cooperation in Research and Higher Education (STINT) Joint China-Sweden Mobility Programme** 2020 - 2023
Partners: University of Gothenburg (GU) and Peking University (PKU)

Project title: Understanding the Hygroscopicity and Ice Nucleation Activity of Secondary Organic Aerosol on a Molecular Level

Project reference number: CH2019-8361, SEK 600,000 + CNY 400,000

Role: Principal investigator.

National Natural Science Foundation of China (NSFC) General Program 2020 - 2023

Title: Direct Experimental Characterization of Aerosol Interface Properties and Processes under Relevant Atmospheric Conditions

Project reference number: 41975160, € 65,000 (CNY 490,000)

Role: Principal investigator.

The Swedish Foundation for International Cooperation in Research and Higher Education (STINT) Initiation Grants 2017 - 2018

Partners: University of Gothenburg (GU) and Massachusetts Institute of Technology (MIT)

Project title: Sea Salt Particles Acting as Cloud Seeds: Deliquescence, Ice Nucleation and Ice Sublimation

Project reference number: IB2016-6612, SEK 150,000

Role: Principal investigator.

Swedish Research Council (vetenskapsrådet, VR) International Postdoc Fellowship 2015 - 2017

Project title: A new view on ice surface disorder and its role in geochemical processes

Project reference number: 2014-6924, € 224,000 (SEK 2,100,000)

Role: Principal investigator.

Swedish Research Council (vetenskapsrådet, VR) Project Research Grant 2016 - 2019

Project title: Towards a molecular-level understanding of interface processes in the atmosphere

Project reference number: 2015-04212, € 350,000 (SEK 3,265,000)

Role: Co-investigator.

Individual Fellowships, Awards and Scholarships

National Natural Science Foundation of China (NSFC) fellowship	China 2020-2023
The Swedish Foundation for International Cooperation in Research and Higher Education (STINT) Initiation Grants	Sweden 2017-2018
Swedish Research Council (vetenskapsrådet, VR) international postdoc fellowship	Sweden 2015-2017
International Union of Geodesy and Geophysics (IUGG)/International Association of Meteorology and Atmospheric Sciences (IAMAS) grant	USA 2017
The Royal Society of Arts and Sciences in Gothenburg (KVVS) scholarship	Sweden 2016
Wenner-Gren Stiftelserna grant	Sweden 2020&2018&2016&2015
International Global Atmospheric Chemistry (IGAC) grant	International 2014
European Geosciences Union (EGU) grant	Europe 2014
Ångpanneföreningens Forskningsstiftelse grant	Sweden 2013
National Science Foundation Office of Polar Programs grant	USA 2013
International Association of Cryospheric Sciences (IACS) grant	International 2012
Kunt och Alice Wallenbergs Stiftelse grant	Sweden 2014&2012
Adlerbertska stipendiestiftelsen scholarship	Sweden 2013&2012&2011
National Volleyball Second-level Athlete	China 2000

Teaching Experience

01/2010 - 12/2013

University of Gothenburg, Department of Chemistry and Molecular Biology

Tasks: Lab assistant in 'aerosol', 'general chemistry', 'inorganic chemistry', 'environmental modeling', 'environmental chemistry', etc.

01/2019 – ongoing

University of Gothenburg, Department of Chemistry and Molecular Biology

Tasks: Lecturer in 'aerosol'.

Supervision

Co-supervisor for PhD students

Ms. Sofia Johansson, 02/2015 - 01/2020, University of Gothenburg, Sweden

Ms. Shuzhen Chen, 04/2016 - 04/2017, Paul Scherrer Institute, Switzerland

Mr. Viktor Andersson, 08/2018 - , University of Gothenburg, Sweden

Mr. Yaxin Ge, 09/2018 - , University of Gothenburg, Sweden

Mr. Luis Santos, 11/2018 - , University of Gothenburg, Sweden

Reviewer

Appraiser at the Natural Science Foundation of China (NSFC)	2020-
Appraiser at the Swiss National Science Foundation (SNSF)	2019-
Reviewer for the Royal Society of Chemistry journals (Nanoscale, etc.)	2017-
Reviewer board member for MDPI journals	2017-
Reviewer for the ACS journals (JPC A/B/C/Letter, EST, etc.)	2015 -

Organized Workshops

GU & MIT Workshop 2017 ---- Insights into Sea Salt and Organic Aerosols

Gothenburg, June 2017

Role: Main organizer

Publication List

-----to be submitted-----

1. X.R. Kong, M. Priestley, X. Pei, Y. Zhu, Z. Wu, T. Ohgashi, H. Yuzawa, J. Pettersson, and M. Hallquist, Chemical Mapping Potassium-containing Particles from Biomass Burner and in Ambient Air, to be submitted to *AIP Conference Proceeding for the 15th International Conference on X-ray Microscopy (XRM2020)*.
2. X.R. Kong, J. Lovrić, S.M. Johansson, N. Prisle, and J.B.C. Pettersson, Dynamics and Kinetics of Methanol monomers and clusters on Graphite and Nopinone Surfaces, to be submitted to *J. Chem. Phys.*

-----under review-----

1. T. Bartels-Rausch, X.R. Kong, F. Orlando, L. Artiglia, A. Waldner, T. Huthwelker and M. Ammann, Interfacial Supercooling and the Precipitation of Hydrohalite in Frozen NaCl Solutions by X-ray Absorption Spectroscopy, *The Cryosphere*, under review.
2. S.M. Johansson, J. Lovrić, X.R. Kong, E. S. Thomson and J.B.C. Pettersson, Water interactions with condensed carboxylic acids: adsorption and desorption of water on valeric acid surfaces, in press in *Phys. Chem. Chem. Phys.*

-----published-----

1. X.R. Kong, C.M. Salvador, S. Carlsson, R. Pathak, K.O. Davidsson, M. Le Breton, S. M. Gaita, K. Mitra, Å.M. Hallquist, M. Hallquist, and J.B.C. Pettersson, Molecular Characterization of Emissions from a Residential Wood Burning Boiler, *Sci. Total Environ.*, 754 (2020), 142143.
2. S.M. Johansson, J. Lovrić, X.R. Kong, E. S. Thomson, M. Hallquist, and J.B.C. Pettersson, An Experimental and Computational Study of Water Interactions with Condensed Nopinone Surfaces at Atmospherically Relevant Conditions, *J. Phys. Chem. A.*, 124 (2020) 3652-3661.

3. X.R. Kong, D. Castarede, A. Boucly, L. Artiglia, M. Ammann, T. Bartels-Rausch, E. Thomson, and J.B.C. Pettersson, Reversible Physisorbed and Chemisorbed Water on Alkaline Organic Salt Surface at Atmospheric Conditions, *J. Phys. Chem. C*, 124 (2020), 5263-5269.
4. J. Noda, R. Bergström, X.R. Kong, T. L. Gustafsson, B. Kovacevik, M. Svane, and J.B.C. Pettersson, Aerosol from Biomass Combustion in Northern Europe: Influence of Meteorological Conditions and Air Mass History, *Atmosphere*, 10 (2019), 789.
5. F. Orlando, L. Artiglia, H. Yang, X.R. Kong, K. Roy, A. Waldner, S. Chen, T. Bartels-Rausch and M. Ammann, Disordered Adsorbed Water Layers on TiO₂ Nanoparticles under Subsaturated Humidity Conditions at 235 K, *J. Phys. Chem. Lett.*, 10 (2019), 7433-7438.
6. X.R. Kong, E. Thomson, N. Marković, and Jan B. C. Pettersson, Dynamics and Kinetics of Methanol - Graphite Interactions at Low Surface Coverage, *ChemPhysChem*, 20 (2019), 2171-2178. (Cover Paper).
7. Johansson, J. Lovrić, X.R. Kong, E. S. Thomson, P. Papagiannakopoulos, C. Toubin and J. B. C. Pettersson, Understanding Water Interactions with Organic Surfaces: Environmental Molecular Beam and Theoretical Studies of the Water – Butanol System, *Phys. Chem. Chem. Phys.*, 21 (2019), 1141-1151.
8. X.R. Kong, C. Toubin, A. Habartova, E. Pluharova, M. Roeselova and J.B.C. Pettersson, Rapid Water Transport through Organic Layers on Ice, *J. Phys. Chem. A*, 122 (2018), 4861-4868.
9. X.R. Kong, M. Wolf, M. Roesch, E. Thomson, T. Bartels-Rausch, P. Alpert, M. Ammann, N. Prisle and D.J. Cziczo, A Continuous Flow Diffusion Chamber Study of Sea Salt Particles Acting as Cloud Nuclei: Deliquescence and Ice Nucleation, *Tellus B: Chemical & Physical Meteorology*, 70 (2018), 1463806.
10. A. Waldner, L. Artiglia, X.R. Kong, F. Orlando, M. Ammann and T. Bartels-Rausch, Formic Acid in the Disordered Interface of Ice at 253 K: A Near-ambient Pressure X-ray Photoemission Spectroscopy Study, *Phys. Chem. Chem. Phys.*, 20 (2018), 24408-24417
11. X.R. Kong, A. Waldner, F. Orlando, M. Birrer, L. Artiglia, M. Ammann, T. Huthwelker, and T. Bartels-Rausch, Coexistence of Physisorbed and Solvated HCl at Warm Ice Surfaces, *J. Phys. Chem. Lett.*, 8 (2017) 4757-4762.
12. T. Bartels-Rausch, F. Orlando, X.R. Kong, L. Artiglia, M. Ammann, Experimental Evidence for the Formation of Solvation Shells by Soluble Species at the Ice Surface, *ACS Earth and Space Chemistry*, 1 (2017) 572-579.
13. S.M. Johansson, X.R. Kong, E.S. Thomson, M. Hallquist, and J.B.C. Pettersson, The Dynamics and Kinetics of Water Interactions with a Condensed Nopinone Surface, *J. Phys. Chem. A*, 121 (2017) 6614-6619.
14. S.M. Johansson, X.R. Kong, P. Papagiannakopoulos, E.S. Thomson, and J.B.C. Pettersson, A Gas-Vacuum Interface for Environmental Molecular Beam Studies, *Rev. Sci. Instr.*, 88 (2017) 035112.
15. E.S. Thomson, X.R. Kong, N. Markovic, P. Papagiannakopoulos, J.B.C. Pettersson, Deposition-mode Ice Nucleation Reexamined at Temperatures below 200 K, *Atmos. Chem. Phys.*, 15 (2016) 1621-1632.
16. X.R. Kong, P. Papagiannakopoulos, E.S. Thomson, J.B.C. Pettersson, Water Accommodation and Desorption Kinetics on Ice, *J. Phys. Chem. A*, 118 (2014) 3973-3979.
17. X.R. Kong, E. S. Thomson, P. Papagiannakopoulos, S. Johansson, and J.B.C. Pettersson, Water Accommodation on Ice and Organic Surfaces: Insights from Environmental Molecular Beam Experiments, *J. Phys. Chem. B*, 118 (2014) 13378-13386.
18. P. Papagiannakopoulos, X.R. Kong, E.S. Thomson, J.B.C. Pettersson, Water Interactions with Acetic Acid Layers on Ice and Graphite, *J. Phys. Chem. B*, 118 (2014) 13333-13340.
19. E.S. Thomson, X.R. Kong, N. Markovic, P. Papagiannakopoulos, J.B.C. Pettersson, Collision Dynamics and Uptake of Water on Alcohol-covered Ice, *Atmos. Chem. Phys.*, 13 (2013) 2223-2233.
20. P. Papagiannakopoulos, X.R. Kong, E.S. Thomson, N. Markovi, J.B.C. Pettersson, Surface Transformations and Water Uptake on Liquid and Solid Butanol near the Melting Temperature, *J. Phys. Chem. C*, 117 (2013) 6678-6685.
21. Z. Niu, X. Zhang, S. Wang, Z. Ci, X.R. Kong, Z. Wang, The Linear Accumulation of Atmospheric Mercury by Vegetable and Grass Leaves: Potential Biomonitors for Atmospheric Mercury Pollution, *Environ. Sci. Pollut. Res.*, 20 (2013) 1-7.
22. X.R. Kong, P.U. Andersson, E.S. Thomson, J.B.C. Pettersson, Ice Formation via Deposition Mode Nucleation on Bare and Alcohol-covered Graphite Surfaces, *J. Phys. Chem. C*, 116 (2012) 8964-8974.

23. Z.C. Niu, F.W. Zhang, X.R. Kong, J.S. Chen, L.Q. Yin, L.L. Xu, One-year Measurement of Organic and Elemental Carbon in Size-segregated Atmospheric Aerosol at a Coastal and Suburban Site in Southeast China, *J. Environ. Monit.*, 14 (2012) 2961-2967.
24. E.S. Thomson, X.R. Kong, P.U. Andersson, N. Markovic, J.B.C. Pettersson, Collision Dynamics and Solvation of Water Molecules in a Liquid Methanol Film, *J. Phys. Chem. Lett.*, 2 (2011) 2174-2178.
25. X.R. Kong, P.U. Andersson, N. Markovic and J.B.C. Pettersson, Environmental Molecular Beam Studies of Ice Surface Processes, *Physics and Chemistry of Ice 2010*, in *12th International Conference on the Physics and Chemistry of Ice (PCI-2010)*, Y. Furukawa, G. Sazaki, T. Uchida, N. Watanabe (Eds.), Hokkaido University Press, Sapporo, Japan, 2010, 79-88.
26. X.R. Kong, D. Qu and L.N. Zhou, Effects of Sulfur Nutrition on Root Hydraulic Conductivity of Maize and Wheat under Heavy Metals Stress, *Acta Botanica Boreali-Occidentalia Sinica*, 27 (2007), 2257-2262.

International Conferences and Seminars

Innovation Forum at the Northwest University of China

Xi'an, China, October 2019

Title: Aerosol Interface Research ----- from Global Warming to Synchrotron (INVITED)

Special Seminar at the Institute of Earth Environment, Chinese Academy of Science

Xi'an, China, October 2019

Title: Aerosol Interface Research ----- from Synchrotron to Environmental Molecular Beams (INVITED)

Sweden-China Framework Project (Photosmog) Conference

Beijing, China, October 2019

Title: Factor Analysis and Molecular Characterization of Emissions from Biomass Burning

The 20th International Conference on Nucleation and Atmospheric Aerosols (ICNAA 2017)

Helsinki, Finland, June 2017

Talk title: A Continuous Flow Diffusion Chamber Study of Sea Salt Particles Acting as Cloud Seeds: Deliquescence, Ice Nucleation and Sublimation

American Geophysical Union Fall Meeting (AGU2016)

San Francisco, CA, US, December 2016

Talk title: Hunting liquid micro-pockets and quasi-liquid layers in snow and ice.

European Science Foundation (ESF) Workshop on Microphysics of Ice Clouds

Vienna, Austria, April 2015

Talk title: Molecular Investigations of Atmospheric Ice Formation and Growth (INVITED)

Workshop on Chemical Atmosphere-Snow-Sea Ice Interactions: taking the next big step in the field, lab & modelling

Cambridge, UK, October 2014

Talk title: Development of a New Generation of Environmental Molecular Beam Method

13th International Conference on the Physics and Chemistry of Ice (PCI-2014)

Hanover, NH, USA, March 2014

Talk title: Water Accommodation on Bare and Coated Ice Surfaces

Davos Atmosphere and Cryosphere Assembly (DACA13)

Davos, Switzerland, July 2013

Talk title: Accommodation Coefficient and Kinetics of D₂O on Ice Surface between 170 K and 200 K

Granted Beamtime in Synchrotron Facilities

As PI:

>3 STXM beamtime at UVSOR, Japan

2019 -

>5 APXPS beamtime at SLS, Switzerland

2017 -

Design the experiments; write the proposal; coordinate samples, materials and the measurements during the beamtime.

As participant:

Multiple beamtime (> 10) at UVSOR and SLS

since 2015

Organized Field Experience

Evaluating Small Scale Biomass Burner at RISE, Borås, Sweden

4-5/2018 & 3-4/2019

Coordination of atmospheric measurements for evaluating emissions from biomass burners during the two 5-week-long campaign. The instrumentation included CIMS, SID, PAM chamber for aerosol aging, PASS-3, SMPS, AAC, CPC, GRIMM dust monitor, gas analyzers, CCNc, and dilution systems.

References

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