

## Zamin A. Kanji

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### Experimental Atmos. Phys. Group Leader • Environmental System Sciences • ETH Zurich

#### Education

2005 – 2009 PhD., Department of Chemistry, University of Toronto, Canada  
2003 – 2005 MSc., Department of Chemistry, University of Toronto, Canada  
1999 – 2003 BSc., Honours, Class 1, Chemistry specialization, Queen's University, Canada

#### Honours and Awards

2001 Queen's University Summer Work Experience Program (C\$ 3700)  
2001 Queen's University Dean's Honour List for Chemistry  
2002 Queen's University Summer Work Experience Program (C\$ 4600)  
2003 Graduated with Class 1, Honours in Chemistry  
2003 University of Toronto Fellowship (C\$ 5000)  
2006 Department of Chemistry Travel Award (C\$ 1000)  
2007 Centre for Global Change Science (C\$ 5000)  
2008 University of Toronto Fellowship (C\$ 5000)  
2008 Environmental Chemistry Colloquium, Best Presentation Award (\$100)  
2011 Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCESS) and Gordon Research Conferences, attendance (fully funded)  
2011 Teaching Innovation, ETH – Zurich (*Innovedum – ETH*, CHF 58'500)  
2012 The Princeton Review: Teaching Hall of Fame, Best Chemistry Instructor, Canada Wide for Teaching Years 2005-2009  
2012-2013 NSERC Visiting Scientist Fellowship (C\$ 58,600/year) for up to 3 years  
2013 Young Scientist Travel Award, International Commission on Cloud Physics (C\$ 1650)

#### Knowledge Dissemination (details in publications section)

**3274 citations, n = 78, h-index 33, average citations per item = 42**

Summary of Indexed Articles: Web of Science (29.03.2024, AU= (Kanji ZA/Z and Abdulali-Kanji)

[Google Scholar \(Zamin. A. Kanji\)](https://scholar.google.com/citations?user=kanji) • [ORCID: 0000-0001-8610-3921](https://orcid.org/0000-0001-8610-3921) • [Researcher ID F-6465-2019 \(W of S\)](https://pubs.rsc.org/author/kanji)

**34 invited talks**, presented at 47 international conferences and contributed to > 170 conference presentations

#### Proposals Funded (only competitive funding included)

<i>Funding Period/ Date Submitted</i>	<i>Agency, Title of Grant Proposal and Role</i>	<i>Amount Funded My share only (requested) CHF</i>
2011 – present	<u>Total secured competitive third-party funding</u>	<u>5, 772, 609</u>
2025 – 2028	Swiss National Science Foundation – Research Infrastructures: ACTRIS Switzerland, implementation to operation (phase 2) – Cloud in-situ measurements at High Altitude Research Station, Jungfrauoch	(460, 500)
2024 – 2027	Simons Foundation USA - Atmospheric Aging Impacts on Particles for Cirrus Cloud Seeding – PI	1, 313, 290 (1, 313, 290)

2024 – 2027	<i>Simons Foundation USA - Stratospheric Aerosol Injection across Scales (SAIaS), Co-PI</i>	257, 073 (257, 073)
2024-2028	<i>EU-HORIZON with Swiss State Secretariat for Research and Innovation – Cloud-aERosol inTeractions &amp; their impActs IN The earth sYstem (CERTAINTY), Swiss-PI</i>	602,396 (602, 396)
2023-2027	<i>Swiss National Science Foundation – The role of particle size, organic matter, and freezing mode for ice nucleation on mineral and soil dusts – Co-PI</i>	294, 864 (294,864)
2023-2027	<i>Swiss National Science Foundation - Ice nucleating particles and cloud condensation nuclei properties in the north-western Himalayas (ICE CRUNCH) - PI</i>	349, 925 (349, 925)
2021-2024	<i>Aerosol, Cloud and Trace gases Research InfraStructure Network (ACTRIS) – Funding from Swiss State Secretariat for Research and Innovation (SERI) – Monitoring INPs at two MeteoSwiss Stations – PI</i>	288, 000 (320, 000)
2020 – 2024	<i>Swiss National Science Foundation - AerOsol-Cloud Interactions: the Role of orgAnic compounds in CLOUD droplet activation (ORACLE) – Co-PI</i>	306, 241 (306, 241)
2020 – 2023	<i>EU Horizon 2020 Action – Advancing the SCience for Aviation and Climate (ACACIA), Co – PI</i>	326, 977 (327, 956)
2019 - 2020	<i>Swiss Polar Research Institute – Ice Nucleating Particles In the Greenland Marine Atmosphere (INIGMA) – PI</i>	124,000 (147, 958)
2018 - 2021	<i>Global Atmospheric Watch – Monitoring of Ice Cloud Forming Aerosols at the Jungfraujoch: Development of HINC-Auto for Continuous INP Monitoring – PI</i>	308, 223 (308, 223)
2015 – 2019	<i>ETH Research Grant – The Role of Cloud Processing on the Ice Nucleation Properties of Atmospheric Black Carbon (BC) – PI</i>	215, 400 (252, 408)
2015 – 2019	<i>Swiss National Science Foundation – Elucidating Atmospheric Ice Nucleation Mechanisms: Is Deposition Nucleation Really Immersion Freezing in Pores? - PI</i>	453, 848 (516, 911)
2014 – 2017	<i>Global Atmospheric Watch – Field Measurements on Aerosols Acting as Ice Nuclei and their Influence on Mixed-Phase Clouds – PI</i>	323, 588 (323, 588)
2013 – 2015	<i>Swiss National Science Foundation – Laboratory Studies of Ice Nucleation Properties of Fresh and Aged Mineral Dust Particles, Co-PI</i>	345, 284 (809, 831)
2014 – 2015	<i>ETH – EQUIP – The Horizontal Ice Nucleation Chamber, HINC – PI</i>	125, 000 (155, 552)
2013 – 2014	<i>ETH – EQUIP – The Portable Ice Nucleus Counter, PINC 2<sup>nd</sup> Generation, Co-PI</i>	80, 000 (94, 320)
2011 – 2012	<i>Innovedum, ETH – Zurich – Interactive Cloud Microphysics Tools, teaching innovation proposal <b>Principal Investigator (PI)</b></i>	58, 500 (58, 500)

**Technology Exchange/Sales/Consulting:**

Since 2018	<i>Sales</i> of two self-developed cloud chamber, HINC/HINC-Auto (CHF ~160k/chamber)
2019 – 2022	<i>Consulting:</i> Cloud seeding material laboratory tests for Basler Versicherung (~ CHF 150 k)

2016 – 2021 **Technology exchange:** of a portable cloud chamber for airborne measurements with  
Laboratoire de Météorologie Physique (LaMP)

**Invited Talks**

- 34 2025 – Feb. *Faraday Discussions, Atmospheric Chemistry in Cold Atmospheres, Royal Society of Chemistry, London UK,*
- 33 2024 – Nov. Simons Foundation Solar Radiation Management Kickoff meeting, Atmospheric Aging Impacts of Aerosol for Cirrus Cloud Seeding
- 32 2024 – May Central University of Jammu, Jammu and Kashmir, Dept. of Environmental Sciences
- 31 2023 – Dec. American Geophysical Union, San Francisco, California, USA
- 30 2023 – Oct. US, Dept. of Energy Atmospheric Systems Research Workshop on Ice Processes, PNNL, Richland, WA, USA
- 29 2023 – Jun. Colloquium of Environmental Sciences, Paul Scherer Institute, Villigen, Switzerland
- 28 2022 – Jan. 14<sup>th</sup> Symposium on Aerosol-Cloud-Climate Interactions, American Meteorological Society, Houston, TX, USA
- 27 2021 – Aug. Plenary talk: Diversity Equity and Inclusion in the Cloud Physics Community (shared with K. Ardon-Dryer and L. Ladino): The International Conference on Clouds and Precipitation, Pune, India
- 26 2021 – Mar. 11<sup>th</sup> VERT Forum, Technologies and Policies Towards Zero Impact Combustion Engines, Zurich, Switzerland
- 25 2020 – Nov. Oslo Join Seminar in Atmospheric, Ocean and Climate Science, University of Oslo, Norway
- 24 2020 – Nov. Gothenburg Air and Climate Network, Gothenburg University, Sweden
- 23 2019 – Jan. Institute of Atmospheric and Environmental Sciences Colloquium, Goethe University, Frankfurt, Germany
- 22 2018 – Dec. Institute for Meteorology and Climate Research Colloquium, Karlsruhe Institute of Technology, Germany
- 21 2018 – Oct. Geological Sciences Colloquium, University of Basel, Switzerland
- 20 2018 – Jul. Aerosols and Clouds: Connections from the Laboratory to the Field to the Globe, Telluride Science Research Centre Meeting, Telluride, USA.
- 19 2018 – Feb. INUIT Final Conference and 2<sup>nd</sup> Atmospheric Ice Nucleation Conference, Grasellenbach, Germany
- 18 2018 – Apr. Beijing University of Aeronautics and Aerospace, and Peking University, joint lecture, Beijing, China
- 16 2017 – Dec. Atmospheric Ice-Nucleating Particles, and Ice Cloud Formation, American Geophysical Union Meeting, New Orleans, USA.
- 15 2017 – Aug. Current Overview of Atmospheric Sciences Lecture Series, University of Mexico, Mexico City, Mexico
- 17 2017 – Jan. BACCHUS (EU project) annual meeting, ETH – Zurich, Switzerland
- 13 2016 – Jun. Canadian Society for Chemistry, Atmospheric Chemistry Symposium, Halifax, Canada
- 12 2015 – May MeteoSwiss, Global Atmospheric Watch Meeting, Zurich, Switzerland
- 11 2015 – Jun. ETH – Department of Environmental System Sciences, Professorship Conference, Davos, Switzerland
- 10 2015 – Feb. University of Toronto, Env. Chem. Colloquium, Toronto, Canada
- 9 2015 – Jan. Year of the Maritime Continent International Science Meeting, Singapore
- 8 2014 – May MeteoSwiss, Global Atmospheric Watch Meeting, Zurich, Switzerland

- 7 2013 – Oct. University of Toronto, Invited Lecturer (4 weeks), Toronto, Canada
- 6 2012 – Jul. Wilfrid Laurier University, Dept. of Chemistry, Waterloo, Canada
- 5 2012 – Jul. Environment and Climate Change Canada, Air Quality Division, Toronto, Canada
- 4 2012 – Feb. Institute of Meteorology and Climate, Karlsruhe Institute of Technology, Karlsruhe, Germany
- 3 2012 – Dec. Dalhousie University, Atmos. Sciences Dept., Halifax, NS, Canada
- 2 2011 – Jul. Public Lecture, Department of Environmental Engineering, Ecole Polytechnique Federale, Lausanne, Switzerland
- 1 2011 – Jul. Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCESS), Brookhaven National Laboratory, NY, USA

### **Professional Activities including elected positions**

- Since July 2023 Elected to the **Committee on Nucleation and Atmospheric Aerosols (ICNAA)** for a 2-year term
- Since Aug. 2022 Elected Expert to the **Impacts and Science Group (ISG)** on contrail cirrus of the Committee for Aviation and Environmental Protection (CAEP) of the International Civil Aviation Organization (ICAO) panel
- Since Aug. 2021 Elected to the **International Commission on Clouds and Precipitation (ICCP)** for a 4-year term
- Since Jul. 2021 **Summer School Lecturer and Facilitator on Nucleation and Aerosol Cloud Interactions:** Intensive workshop on atmospheric and environmental chemistry ([IWAEC](#)) ~ 60 attendees
- Since Oct. 2020 **Editor**, for journal Atmospheric Measurement Techniques, Copernicus publications
- Since 2019 **Expert Panel Member** of the interdisciplinary physical sciences and engineering panel and Earth Sciences (ST10) National Science Centre, Poland (NCN)
- Since 2019 **Elected to the Swiss National Committee of the International Union of Geodesy and Geophysics (IUGG) as SCNAT delegate** to the Plenary of the International Association of Meteorology and Atmospheric Sciences (IAMAS)
- Since 2019 **External Examiner PhD thesis:**  
Meng Si – University of British Columbia, Dept. of Chemistry, Supervisor: Allan Bertram  
Tao Chen – Rennes Institute of Chemical Sciences, Supervisor: Khalil Hanna
- Since 2016 **Grant Proposal Reviewer:**  
Austrian Science Fund, Natural Sciences and Engineering - **Austria**  
National Science Foundation – **USA**  
Department of Energy (DOE), **USA**  
National Environment Research Council (NERC), **UK**  
National Science Centre (physical sciences and engineering panel, GRIEG, OPUS, SONATINA and PRELUDIUM calls), **Poland/Norway**  
Independent Research Fund (DFF), **Denmark**  
Novo Nordisk Fonden, **Denmark**
- Since 2015 **External Committee Member to ETH PhD students:** 7 PhD students
- Since 2009 **Peer reviewer - scientific papers:** Science, Nature, Nature Geoscience, Scientific Reports (Nature), Journal of Atmospheric Sciences (JAS), Atmospheric Chemistry and Physics (ACP), Physical Chemistry Chemical Physics (PCCP), Chemical Society Reviews (Chem. Soc. Rev.), Journal of Geophysical Research (JGR), Geophysical Research Letters (GRL), Atmospheric Pollution (Atmos. Polln.), Atmosphere, Atmospheric Measurement Techniques (AMT), Environmental Science and Technology (ES&T), Environmental Science and

- Technology Letters (ES&T Lett.) Environmental Science Processes and Impacts (ESPI), Atmospheric Environment (Atmos. Env) and Nanoscale (RSC).
- 2019 – 2021 **Member of the Board of Directors** of the Institute for Atmospheric and Climate Sciences, ETH Zurich. (IAC – ETH Insitutsrat)
- 2020 – Nov. **Invited Panel Member:** Round table on Equity Diversity Inclusion Initiatives (EDII), Queen’s University Graduate Chemistry Symposium, Queen’s University, Kingston, ON, Canada
- 2017 – Dec. Outstanding Student Poster Judge, American Geophysical Union (AGU), San Francisco, CA
- 2017 – Dec. Career Research Advice Mentor and Undergraduate Mentoring Program, AGU, San Francisco, CA
- 2011 – Dec. Outstanding Student Poster Judge, AGU, San Francisco, CA

### **Further Education**

- 2019 2 European Course Credits (ECTS), Basic German 3 (A2) ETH – University of Zurich
- 2010 – 2011 2 ECTS, Science and Communication, and Project Management, University of Bern, Switzerland

### **Conference organisation and Session Convener/Chair**

- 2025 – Jul. *Ice at the microscale, Monte Verita, Ascona, Switzerland, Organising International conference for 120 people*
- 2025 – Apr. *Session organiser and co-convener, Atmospheric microplastics and nanoplastics, EGU, Vienna, Austria*
- 2023 – Jul. Session organiser and primary convener, Cloud Nucleation Studies, IUGG Berlin, Germany
- 2022 – Sept. Session chair, New Particle Formation and Ice Nucleation, IAC, Athens, Greece
- 2019 – Dec. Session convener, Atmospheric Sciences (A026, A51D, A530), American Geophysical Union (AGU), San Francisco, CA, USA.
- 2019 – July Session chair, IAMAS symposium, Cloud-Precipitation Aerosol, Montreal, QC, Canada
- 2019 – April Session chair, aerosol concentrations, trends, transport-measurement and models, international conference on carbonaceous particles in the atmosphere, Vienna, Austria
- 2017 – Apr. Co-organizer of 5<sup>th</sup> Workshop on Microphysics of Ice Clouds, Vienna, Austria
- 2014 – Dec. Primary Convener, Atmospheric Sciences (sessions A24C, A31E, A31F), AGU, San Francisco, CA, USA
- 2012 – Sept. Session chair, Aerosol Cloud Interactions, European Aerosol Conference, Granada, Spain
- 2012 – Jun. Invited chair and Judge for PhD students project management training, Department of Environmental Sciences, ETH Zurich
- 2011 – Dec. Session chair, Atmospheric Ice Nucleation, AGU, San Francisco, CA

### **Research Employment**

- Since 2018 **Tenured Group Leader/Senior Scientist**, Permanently Appointed, ETH Zurich
- 2020 **Sabbatical: Guest Researcher** at the Gothenburg Air and Climate Network, University of Gothenburg, Sweden
- Sep. – Nov. **Senior Research Scientist**, Atmospheric Sciences, ETH Zurich
- Since Nov.2013 **Group Leader - Atmospheric Physics Laboratory**
- PI of ice nucleation and aerosol physics laboratory, project leader for internal and external projects, including financial planning totalling budgets of ~ CHF 2 million
  - Securing external funding for research and maintaining 5-year strategic outlook for laboratory and field measurements
  - Supervising PhD students and post-doctoral fellows (c.f. below)
  - Experiment and instrument design and development

- Scientific validation of laboratory instruments
- Conceiving scientific objectives, planning and participation in atmospheric field campaigns, international measurement campaigns and research meetings
- Designing syllabi, co-ordinating and teaching courses in atmospheric and cloud physics

2012 – 2013 **NSERC Research Fellow**, Air Quality Research, Environment Canada

*Group: Shao-Meng Li and John Liggio*

- Investigating the partitioning nature of semi/volatile organics as a function of emission distance and aerosol particle composition using online aerosol mass spectrometry

2009 – 2012 **Post-doctoral Fellow**, Atmospheric Physics, ETH – Zurich

*Group: Atmospheric Physics - Ulrike Lohmann*

- Instrument development: Stainless steel aerosol chamber (3 m<sup>3</sup>) to study heterogeneous ageing of mineral aerosols by O<sub>3</sub>
- Ice nucleation: Condensation, Deposition and Immersion mode nucleation of O<sub>3</sub> – aged mineral aerosols
- Ice nucleation: of externally and internally mixed mineral dust, soot and ambient aerosol with secondary organic aerosol coatings

2005 - 2009 **Doctoral Research**, Dept. of Chemistry, University of Toronto

*Thesis title: Laboratory studies of deposition mode heterogeneous ice nucleation: Effects of ice nuclei composition, size and surface area. Supervisor: Jonathan P. D. Abbatt*

- Designed and developed an ice nucleus counter based on the Continuous Flow Diffusion Chamber (CFDC) design, including experiments to verify and validate the newly developed instrument
- Designed and conducted size resolved measurements on mineral particles for deposition ice formation in cirrus cloud regime
- Studied growth kinetics of ice crystals at 223 K to optimise operation conditions
- Participated in the International Ice Nucleation Workshop to compare ice nucleation measuring systems in 2007 where self-developed instrument was successfully deployed.
- Inferred relative role of classes of aerosols in deposition mode ice nucleation using a static chamber flow cell technique with optical imaging detection
- Completed graduate course work in, Advanced Topics in Analytical Chemistry and Topics in Environmental Chemistry.

2003 - 2005 **Masters Research**, Dept. of Chemistry, University of Toronto

*Thesis title: Laboratory studies of ice formation via deposition mode nucleation onto mineral dust and n-hexane soot mineral dust samples. Supervisor: Jonathan P. D. Abbatt*

- Modified an FT-IR cell to study water vapour absorption at low pressures and temperatures – upper troposphere conditions
- Designed and developed static chamber flow cell with optical imaging for ice nucleation detection for 263-218K
- Identified the role of aerosol surface area on ice deposition ice formation
- First works to identify the role of (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> as a heterogeneous ice nuclei and potential path way for cirrus cloud formation
- Revised conventional definition of ‘insolubility requirement’ for deposition ice formation to ‘solid/structural requirement’
- Parameterised results using nucleation rates as a function of ambient relative humidity for cold cloud regimes (233K)

- Completed course work in Transport and Fate of Chemical Species and Atmospheric Chemistry

- 2003 **Summer Research Assistant**, Chemistry, Queen's University  
Determining corrosion rates of nickel, titanium and alloys in artificial saliva using electrochemical cells. Application for orthodontic materials. *Supervisor: Gregory Jerkiewicz*
- 2002 **Summer Research Assistant**, Chemistry, Queen's University  
Surface property study and modification of Polydimethylsiloxane (PDMS) for 'lab on a chip' microfluidic devices. *Supervisor: Hugh Horton and Richard Oleschuk*
- 2001 **Summer Research Assistant**, Chemistry, Queen's University  
Quantitative study of bonding interactions between organo-phosphates in a range of pH using self assembled monolayers and chemical force microscopy. *Supervisor: Hugh Horton*

### **Research Supervisory Experience**

#### **Since 2014 Post-Doctoral Fellows Supervised, <sup>\$</sup>Co-Supervised**

- 2024 – current *Kunfeng Gao*: Ice nucleation of sulphuric acid coated, and cloud processed porous particles for cirrus cloud thinning applications
- 2024 – current *Sandro Vattioni*: Aerosol coagulation and sticking coefficients as a function of turbulence for stratospheric aerosol injection modelling
- 2022 - current *Cuiqi Zhang*: Monitoring of ice nucleating particles and liquid water content at two ACTRIS stations in Switzerland as part of incorporating cloud in-situ measurements into the ACTRIS network
- 2021 – current *Jie Chen*: Cloud seeding experiments for hail prevention and automated measurements of ice cloud forming aerosol in the Swiss alps and boundary layer. Brown carbon ice cloud seeding experiments (SNSF Swiss PostDoctoral Fellowship)
- 2020 – 2023 <sup>\$</sup>*Nadia Shardt*: NSERC and ETH post-doctoral fellowship *on the development of a microfluidic ice nuclei counter for measurements of ice nucleation properties of mineral dust mixtures*
- 2018 – 2020 *Carolyn Roesch*: Investigating the role of chemical functional groups on aerosol particles on the differences between condensation and immersion freezing
- 2016 – 2019 *Mikhail Paramonov*: Marie Curie Fellowship on conducting atmospheric aerosol and ice nucleation measurements in the remote atmosphere (2 yrs). Laboratory measurements on the influence of semi volatile matter on ice crystal formation (1.5 yrs)
- 2016 – 2018 <sup>\$</sup>*Nadine Borduas-Dedekind*: NSERC post-doctoral fellowship on the impacts of photochemical ageing of dissolved organic matter on warm and cold cloud formation
- 2016 – 2018 *Monika Burkert-Kohn*: Immersion freezing of ambient and biological particles, instrument inter-comparison (50%) and lab-manager (50%)
- 2014 – 2016 *James Atkinson*: Development of a global database to be maintained by ETH on aerosol ice nucleation data. Field measurements of ice nucleation as an effort to increase spatial

resolution of available data

**Since 2009 PhD Students Supervised, <sup>§</sup>Co-supervised**

- 2024 – current *Tuuli Lehmusjärvi*: “Ice nucleating particle and cloud condensation nuclei properties in the north-western Himalayas. Expected defense: Oct. 2027
- 2023 – current *Anjana Vadhyar*: The role of freezing mode for ice nucleation on mineral dusts. Expected defense Mar. 2027
- 2021 – current *Mayur Sapkal*: The role of organic compounds in cloud droplet activation: Experimental work. Expected defense: Dec. 2024
- 2021 – current <sup>§</sup>*Anna Miller*: Glaciogenic seeding of supercooled low stratus clouds in the Swiss Plateau using drones to seed and measure aerosols. Expected defense: Dec. 2024
- 2020 – 2024 *Baptiste Testa*: Ice nucleating particles in the cirrus regime: Toward a closure of the debate on aviation soot ice nucleation. Defended: Mar. 2024
- 2019 – 2023 *Guangyu Li*: Ice nucleating particles in the Arctic marine atmosphere. *Defended: Mar. 2023*
- 2019 – 2021 *Kunfeng Gao*<sup>1</sup>: Cold cloud formation mechanisms as a function of morphology on soot aerosol (exchange student from Beihang University, Beijing, China). *Defended: May 2022*
- 2018 – 2021 *Cyril Brunner*<sup>2</sup>: Development and application of the automated horizontal ice nucleation chamber for ice cloud forming aerosols. *Defended: Jun. 2021*
- 2018 – 2022 <sup>§</sup>*Jörg Wieder*: The role of aerosol-cloud interactions in orographic precipitation. *Defended: Mar. 2022*
- 2015 – 2019 *Fabian Mahrt*: The role of cloud processing on the ice nucleation properties of atmospheric black carbon (BC). *Defended: Apr. 2019*
- 2015 – 2018 *Robert David*: An investigation of ice nucleation: From pores to the outdoors. *Defended: Sept. 2018*
- 2014 – 2017 *Larissa Lacher*: Field measurements of ice nucleating particle (INP) concentrations in the free troposphere and boundary layer: Influence of biological and dust particles on the INP concentrations. *Defended: Dec. 2017*
- 2012 – 2016 *Monika Kohn*: Research on immersion freezing of ambient and biological particles with a new, self-developed portable immersion freezing chamber. *Defended: Mar. 2016*
- 2012 – 2016 <sup>§</sup>*Yvonne Boose*<sup>3</sup>: Ambient ice nuclei concentrations relevant to cold and mixed phase clouds at the two Global Atmospheric Watch stations. *Defended: Feb. 2016*
- 2009 – 2012 *Andre Welti*<sup>4</sup>: Thesis Title: Experimental Studies on Deposition and Immersion Mode Ice Nucleation on Mineral Dust, *Defended: Jun. 2012*
- Since 2017 Supervisor, MSc. Thesis, Dept. of Environmental System Sciences, ETH Zurich**
- 2021 - 2022 *Omar Girlanda*: Role of nanoplastics on ice nucleation in the cirrus cloud regime
- 2019 - 2020 *Kevin Kilchofer*: Effect of cloud processing on the ice formation properties of organic aerosol
- Killian Brennan*: Testing the pre-activation effect of aerosols forming ice in the Swiss Alps
- 2017 – 2018 *Jörg Wieder*: The High-Speed Particle Phase Discriminator – PPD-HS

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<sup>1</sup> Thesis awarded “high distinction”, Beihang University

<sup>2</sup> Thesis awarded ETH medal

<sup>3</sup> Thesis awarded ETH medal

<sup>4</sup> Thesis awarded ETH medal



- Since 2009**  
2021 - 2022 **Supervisor, BSc. Thesis**, Environmental Sciences, ETH Zurich  
*Renée Wouters*: Assessment of PM emissions from fireworks: A comparison to traffic emissions for the city of Zürich
- 2019 *Andrina Caratsh*: Formation of ice clouds by charcoal and mineral dust aerosol  
*Lucie Roth*: Ice nucleating particles linked to precipitation in orographic terrain
- 2017 – 2018 *Jan Aerni*: Quantification of soot morphological properties: A comparison between different soot types
- 2009 – 2010 *Silvia Richina*: Characterization of ozone concentrations and decay rates in a stainless-steel aerosol tank
- 2009 – 2010 **Mentored**, *Cedric Chou*, Atmospheric Physics Group, ETH Zurich  
PhD student, Investigating ice nucleation properties of atmospheric particles. Thesis Title: Investigation of the Ice Nucleation Properties of Soot, Bio-aerosol and Mineral Dust during various Measurement Campaigns. *Defended: January 2011*
- 2006 – 2007 **Mentored**, *Octavian Florea*, Dept. of Chemistry, University of Toronto  
Supervising BSc. thesis student studying ice nucleation on organic and organic coated particles.

### Teaching Employment Activities

- 2022 – current **Lead Lecturer**, Cloud Microphysics, ETH Zurich
- 2016 – current **Lecturer**, Atmospheric Physics Laboratory Work, ETH Zurich
- Designed atmospheric physics experiments for laboratory course for Master's students
  - Students choose 4 out of 5 available experiments
  - Training in how to write laboratory reports in journal style
- 2016 – 2019 **Lead Lecturer**, Cloud Microphysics, ETH Zurich
- Preparing and presenting lectures to graduate students in the department of environmental systems science
  - Lecture and seminar style classroom discussion
  - Designing and implementing assignments
- Apr. 2018 **Invited Guest Lecturer**, Nucleation Theory and Cloud Physics, Beijing University of Aeronautics and Astronautics (BUAA).
- Designed 3 lectures hours of lectures on nucleation theory and cloud physics
  - Presented state of the art techniques on ice nucleation measurements methods
- Oct. 2013 **PhD Course Invited Lecturer**, Advanced Topics in Atmospheric Chemistry, University of Toronto
- Taught section on water/phase transitions in the atmosphere and climate impacts
  - Course targeted exclusively to PhD students in upper years, based on discussion of up-to-date literature covering latest in relevant experimental techniques and non-text book advancements if knowledge.
  - Developed and introduced tools such as cloud microphysics ice nucleation models with user interfaces, online testing platforms and assignments that directly corresponded to application of existing literature.
- 2010 – 2012 **Project Leader – Teaching Innovation Proposal (CHF 58k)**, Interactive Cloud Microphysics Tools, ETH – Zurich
- Introduced innovative tools to enhance education quality of students in a Master's and PhD course by adding interactive tools and concepts representing up to date scientific

research and technology.

- Developed and introduced tools such as cloud microphysics ice nucleation models with user interfaces, online testing platforms and assignments that directly corresponded to application of existing literature.

- 2010 – 2011 **Master's Course Co-Lecturer**, Cloud Microphysics, ETH – Zurich
- Responsible for preparing curriculum, lecturing and testing MSc. students, including creating teaching and testing material Conduct exam preparation sessions for university students in preparation for end of year exams in form of intensive lectures
- 2008 – 2009 **Physical Chem. Lecturer & Tutor**, Ulife Academics Ltd - Toronto
- Conduct exam preparation sessions for university students in preparation for end of year exams in form of intensive lectures
  - Responsible for creating and editing text and course preparation materials in general chemistry
- 2005 - 2009 **General Chem. Lecturer & Tutor**, The Princeton Review, Toronto
- Lectured and tutored in first year university physical, general and organic chemistry to students preparing to take the physical sciences section of the Medical College Admissions Test (MCAT)
  - Taught and administered chemistry problem sets with applications to medicine and biology scenarios
  - Hired to privately tutor students
- 2003 - 2009 **Graduate Student Instructor General Chem.**, University of Toronto
- Teaching assistant for first year undergraduate chemistry course responsible for solving and teaching general chemistry problem sets, both quantitative and qualitative
  - Conducted exam preparation sessions for tutoring students, privately tutored students off semester, and responsible for marking tests, exams and creating multiple choice questions
- 2006 – 2008 **Private tutor**, Chemistry, Free-lance, Toronto
- Tutored 3 students for a period of 4 – 8 months to prepare for specific standardised exams in chemistry (SAT, MCAT).

#### **Participation in National and International Measurement Campaigns**

- 2013 – current **PI** – Monitoring seasonal concentrations of ice nucleating particles at the high alpine station Jungfraujoch, Switzerland.
- 2021 – August **Co-Pi** – Arctic Century Expedition – measurements of ice and liquid cloud forming aerosol and associated physical and chemical properties in the Russian Arctic
- 2019 – 2020 **PI** – measurements of liquid and ice cloud forming aerosol in Ny-Ålesund, Svalbard
- 2018 – Oct. **Co-PI**: Organised intercomparison of field INP observations of offline and online techniques at the Puy de Dôme observatory, France
- 2018 – Feb. **ETH – PI** – Online measurements of INP in a boreal forest environment, HyIce field campaign in Hyytiälä, Finland.
- 2016 – Apr. **ETH-PI** – Online and offline field measurements of ice nucleating particle concentrations and aerosol properties at the field site Agia Marina, Nicosia, Cyprus, **Funded, BACCHUS EU Project**
- 2015 – Mar. **ETH-PI** – Field campaign for measuring spring ice nucleating particle concentrations in Saharan dust events in Nicosia, Cyprus, **Funded BACCHUS EU project**

- 2015 – Mar. **ETH-PI** – Fifth Ice Nucleation Workshop – 02 (FIN-02), inter-comparison of ice nucleating particle counters, KIT, Karlsruhe, Germany
- 2015 – Aug. **ETH-PI** – Online field measurements of Coastal INP concentrations in Mace Head, Ireland, **Funded, BACCHUS EU Project**
- 2012 – Jul. Laboratory measurement campaign on ice nucleation to investigate deposition and condensation freezing of various mineral dusts (Afghan, German, Saharan) and Martian simulant at KIT, Germany. **Funded EUROCHAMP (\$2000)**
- 2012 – Jan. Winter time field measurements (5 days) using PINC at the High Alpine Research Station, Jungfraujoch for ice nucleation properties of winter-time ambient aerosol. **Funded by Global Atmospheric Watch Program**
- 2010 – Jun. Field measurements of ice nucleation in Saharan Dust events (7 days) using PINC, at the Jungfraujoch, High Alpine Research Station. **Funded by Global Atmospheric Watch Program**
- 2009 – Oct. 4-week Aerosol Cloud Interaction measurement campaign with the portable ice nucleation chamber (**PINC**, developed at ETH-Zurich), to investigate chemical processing of aerosol on ice cloud formation, at KIT, Karlsruhe, Germany. **Funded by EUROCHAMP (\$8000)**
- 2008 – Feb. Data analysis and publication workshop for ICIS 2007, Pontresina, Switzerland. *Oral presentation. Partly funded by EUROCHAMP.*
- 2007 –Sept. International workshop on comparing ice nucleation measuring systems (ICIS 2007), Karlsruhe Institute of Technology (KIT), Germany. Only participant from University of Toronto (UT) and sole PhD student participant amongst PIs and senior scientists. **Funded (\$5000) by Centre for Global Change Science (UT), Oral Presentation and 3-weeks of measurements with self-developed aerosol-ice cloud nucleation chamber**

**Conference/Meeting Presentations** (*co-authors, titles and presentation type in conference list*)

- 2022 11<sup>th</sup> International Aerosol Conference, Athens, Greece
- 2022 14<sup>th</sup> Symposium on Aerosol-Cloud-Climate Interactions, American Meteorological Society, Houston, TX, USA (*invited talk*)
- 2021 The International Conference on Clouds and Precipitation, Pune, India (*invited plenary talk*)
- 2021 11<sup>th</sup> VERT Forum, Technologies and Policies Towards Zero Impact Combustion Engines, Zurich, Switzerland (*invited*)
- 2020 100<sup>th</sup> American Meteorological Society Meeting, 12<sup>th</sup> Symposium on Aerosol-Cloud-Climate Interactions, Boston, MA, USA
- 2020 3<sup>rd</sup> Atmospheric Ice Nucleation Conference (AINC), Boston, MA, USA,
- 2019 Ny-Ålesund atmosphere flagship workshop on black carbon, Oslo, Norway
- 2019 International Association on Meteorology and Atmospheric Sciences (IAMAS) General Assembly, Montreal, QC, Canada
- 2019 International Conference on Carbonaceous Aerosols (ICCP), Vienna, Austria
- 2018 Aerosol-Cloud-Interactions workshop, Telluride, CO, USA (*invited*)
- 15<sup>th</sup> Conference on Cloud Physics, American Meteorological Society, Vancouver, BC, Canada
- 2018 2<sup>nd</sup> International Atmospheric Ice Nucleation Conference, Grasellenbach, Germany (*invited*)
- 2017 BACCHUS (EU project) Annual meeting, ETH – Zurich, Switzerland
- 2017 European Geophysical Union, Vienna, Austria
- 2017 Atmospheric Chemistry Gordon Research Conference, Newry, ME, USA
- 2017 American Geophysical Union (AGU), New Orleans, LA, USA (*invited*)
- 2016 Workshop – Microphysics of Ice Clouds, Vienna, Austria
- 2016 European Geophysical Union (EGU), Vienna, Austria
- 2016 Canadian Society for Chemistry (CSC), Halifax, NS, Canada (*invited*)
- 2016 International Commission on Cloud Physics, Manchester, UK
- 2016 Atmospheric Processes in the Mediterranean, Larnaca, Cyprus (*invited*)

- 2015 Gordon Atmospheric Chemistry Conference, Waterville, NH, USA
- 2015 American Chemical Society Conference, Boston, MA, USA
- 2015 PacifiChem, (Atmospheric Aerosols) Conference, Honolulu, HI, USA
- 2014 Aerosol-Cloud Interactions Symposium, American Meteorological Society, Atlanta, GA, USA
- 2014 Cloud Physics Workshop, MIT, Cambridge, MA, USA
- 2014 14<sup>th</sup> Conference on Cloud Physics, American Meteorological Society, Boston, MA, USA.
- 2014 American Geophysical Union (AGU), San Francisco, CA, USA
- 2013 International Conference on Nucleation and Atmospheric Aerosols, Fort Collins, CO, USA
- 2013 International Commission on Cloud Physics Workshop, Working group Leader, Zurich, Switzerland (*invited*)
- 2013 American Association for Aerosol Research, Portland, OR, USA
- 2012 European Aerosol Conference, Granada, Spain
- 2011 Aerosol Cloud Interactions – Virtual Institute Meeting, Ettlingen, Germany
- 2011 Swiss Climate Research, Young Researchers Meeting, Scientific Project Management Workshop, Lake Murten, Switzerland
- 2011 Gordon Research Conferences: Atmospheric Chemistry, **invited ACCESS participant**
- 2011 American Geophysical Union (AGU), San Francisco, CA
- 2010 Swiss Climate Research, Young Researchers Meeting, Science and Communication Workshop, Lake Murten, Switzerland
- 2010 International Aerosol Conference, Helsinki, Finland
- 2009 International Association for Meteorology and Atmospheric Sciences (IAMAS), Montreal, Canada
- 2009 Aerosol Cloud Interactions III, measurement campaign and workshop on coatings effects on ice formation properties, Karlsruhe, Germany
- 2008 American Geophysical Union (AGU), San Francisco, CA
- 2008 ICIS 07 Data Presentation Workshop, Pontresina, Switzerland
- 2006 Canadian Meteorological and Oceanic Sciences (CMOS), Toronto, ON
- 2006 American Geophysical Union (AGU), San Francisco, CA
- 2005 European Geophysical Union (EGU), Vienna, Austria