



International Laboratory for Air Quality and Health

WHO Collaborating Centre

ANNUAL REPORT 2015

**INTERNATIONAL LABORATORY FOR AIR
QUALITY and HEALTH (ILAQH)**

**WORLD HEALTH ORGANISATION
COLLABORATING CENTRE FOR AIR QUALITY
AND HEALTH**

1. Introduction

The International Laboratory for Air Quality and Health (ILAQH) is part of the Institute for Health and Biomedical Innovation (IHBI) and the Institute for Future Environments (IFE), at the Queensland University of Technology (QUT). ILAQH undertakes research, postgraduate training and consultancy in the complex, interdisciplinary field of air quality and its impact on human health, with a specific focus on ultrafine and nanoparticles. The three main aspects of ILAQH research activities are:

- Comprehensive characterisation of indoor and outdoor air, including emission sources;
- Integrated health and environmental risk assessments; and
- Strategies for controlling and managing air pollutants.

To address the challenge related to the interdisciplinary nature of air pollution and its impact on human health, academics from a number of Faculties within QUT are involved with the programs undertaken by the ILAQH, including discipline areas such as: physics, chemistry, microbiology, mathematics, public health and engineering. The expertise of the ILAQH personnel is strengthened by close collaboration with a number of government and non-government organizations. Through joint research, lecturing and postgraduate student supervision, the ILAQH collaborates closely with a number of North American, European and Asian research and tertiary organizations.

The facility is equipped with state of the art instrumentation for aerosol generation, mass and number size classification; monitoring of atmospheric gases; real time biological studies; vehicle emission testing, filter testing, lung deposition studies, and computer modelling. Access to electron microscopy and analytical chemistry facilities is available through the links existing within the Science and Engineering Faculty.

ILAQH has built up a scientific program, which is recognised internationally through a high publication rate in reputable international journals, visits by scholars from around the world to the facility, and invitations to the ILAQH key researchers to address international conferences and participate in international initiatives. In Australia both the Queensland State and the Federal government and non-government organizations regularly seek the expertise of this facility.

ILAQH is a Collaborating Centre of the World Health Organization on Research and Training in the field of Air Quality and Health, since 2004.

2. ILAQH Researchers in 2015

Director

Professor Lidia Morawska, PhD (School of Chemistry, Physics & Mechanical Engineering)

Academic Staff

Professor Godwin Ayoko (School of Chemistry, Physics & Mechanical Engineering)

Professor Zoran Ristovski (School of Chemistry, Physics & Mechanical Engineering)

Dr Branka Miljevic (School of Chemistry, Physics & Mechanical Engineering)

Research Fellows / Associates

Dr Congrong He

Dr Graham Johnson

Dr Mandana Mazaheri

Dr Phong Thai

Dr Rohan Jayaratne

Dr Sam Clifford

Dr Svetlana Stevanovic

Research Fellowships

Dr Wei Wang

Dr Fernanda Fuoco

Associated Academic Adjunct Staff

Adjunct Prof Giorgio Buonanno (University of Cassino, Italy)

Adjunct Prof Tunga Salthammer (Fraunhofer WKI, Germany)

Adjunct Prof Werner Hoffman (University of Salzburg, Austria)

Postgraduate & Research Co-ordinator

Ms Chantal Labbe

Doctoral Students

Akwasi Bonsu Asumadu-Sakyi (Supervisor: Lidia Morawska)

Andjelija Milic (Supervisor: Zoran Ristovski)

Bijan Yeganeh (Supervisor: Lidia Morawska)

Buddhi Pushpawela (Supervisor: Rohan Jayarante)

Farzaneh Hedayat (Supervisor: Zoran Ristovski)

Jana Adamovska (Supervisor: Zoran Ristovski)

Jayan Karunasinghe (Supervisor: Lidia Morawska)

Joel Alroe (Supervisor: Zoran Ristovski)

Lingli Guo (Supervisor: Lidia Morawska)

Luke Cravigan (Supervisor: Zoran Ristovski)

Marc Mallet (Supervisor: Branka Miljevic)

Mawutorli Nyarku (Supervisor: Lidia Morawska)

Md Mahmudur Rahman (Supervisor: Lidia Morawska)

Peter McGarry (Supervisor: Lidia Morawska)

Reece Brown (Supervisor: Zoran Ristovski)

Rusdin Laiman (Supervisor: Lidia Morawska)

Sarah Lawson (Supervisor: Zoran Ristovski)

Tenzin Wangchuk (Supervisor: Lidia Morawska)

Tommaso Villa (Supervisor: Lidia Morawska)

Xiaoting Li (Supervisor: Lidia Morawska)

Yi Guo (Supervisor: Zoran Ristovski)

Doctoral Students (enrolled in other QUT Schools and other Universities)

Farhad Hossein (Engineering, Supervisor: Richard Brown)

Madhumita Iyengar (Urban Development, Supervisor: Simon Washington)

Meisam Babaie (Engineering, Supervisor: Richard Brown)

Md Animul Islam (Engineering, Supervisor: Richard Brown)

Md Jahirul Islam (Engineering, Supervisor: Richard Brown)

Md Saidul Islam (Engineering, Supervisor: Richard Brown)

Thuy Chu Van (Engineering, Supervisor: Richard Brown)

Masters Students

Praveen Vijaysegaran (Supervisor: Lidia Morawska)

Soon-Che Chan (Supervisor: Godwin Ayoko)

Honours Students

Nassib Jabbour (Supervisor: Graham Johnson)

Postgraduate Completions, PhD

Ali Pourkhesalian, PhD (Supervisor: Zoran Ristovski)

Ehsan Faghihi, PhD (Supervisor: Lidia Morawska)

Mostafizur Rahman, PhD (Supervisor: Zoran Ristovski)

Nitika Mishra (Supervisor: Lidia Morawska)

Postgraduate Completions, Masters

Luke Cravigan, Masters (Supervisor: Zoran Ristovski)

3. Major Developments

In recognition of ILAQH's contribution, the **World Health Organisation** has designated ILAQH, QUT for the third time as a **WHO Collaborating Centre in 2015**.

The Annual Meeting of the ACC-AQSM was held at QUT from the 30 November – 2 December 2015. Professor Morawska is currently leading efforts of an international, multi-disciplinary centre of research, the '**Australia - China Centre for Air Quality Science and Management**' (ACC-AQSM). The aim of the ACC-AQSM is to provide a platform for joint research to further scientific understanding of the multidimensional problem of air pollution and its impact on human health and the environment, to provide technological and innovative solutions to the problem, and to provide input into national policies and thus enabling informed and efficient regular management and control.

4. Awards and Achievements

- Dr Branka Miljevic received the Vice-Chancellors Performance Award for both teaching and research.
- Farhad Salimi, PhD student, received the Outstanding Doctoral Thesis Award.
- Nitika Mishra, PhD student, received the SEF HDR Student Higher Achiever Award for June 2015.
- Tenzin Wangchuk, PhD student, received the SEF HDR Student Higher Achiever Award for July 2015.

5. Peer Reviewed Publications

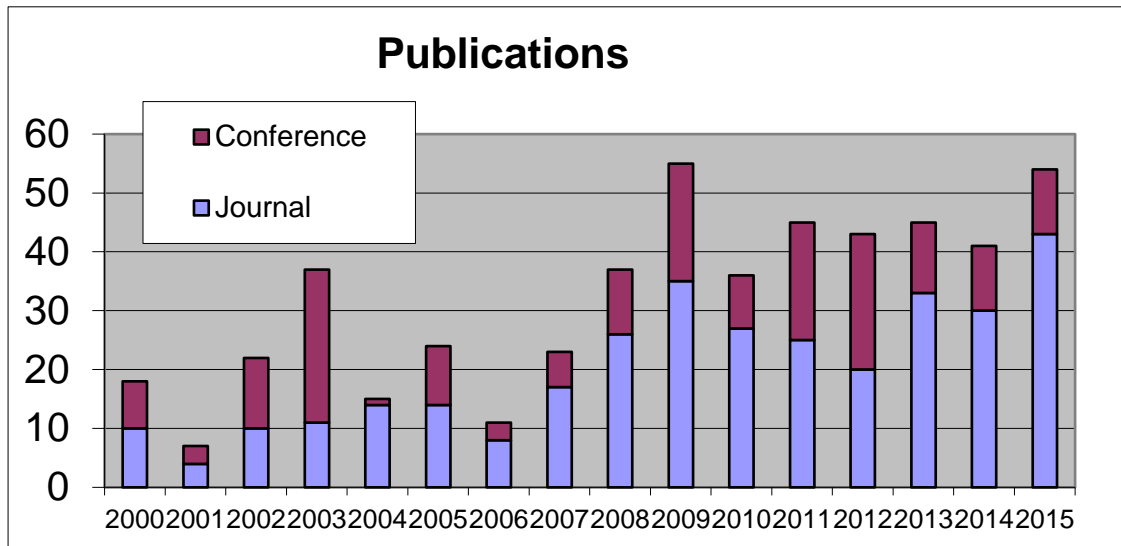


Figure 1. ILAQH Refereed Publications from 2000-2015.

6. Competitive Grants (Granted and Applied)

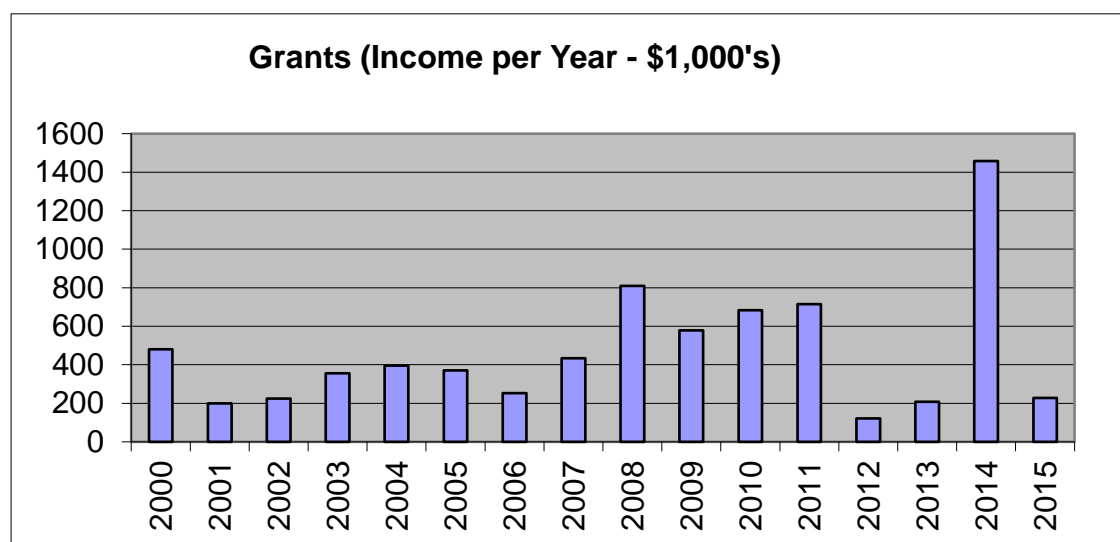


Figure 2. ILAQH Grant Income Distribution per Year (2000-2015)

GRANTED

Project Scheme: Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety (BMUB)

Chief Investigators: Lidia Morawska and Tunga Salthammer

Awarded: \$100,000

Project Title: Evaluation of health related assessment of building product emissions and individual's exposure scenarios – expansion of the IAP web pages

Project Scheme: International Association of Maritime Universities, 2014

Chief Investigators: Vikram Garaniya, Faisal Khan Aspro, Richard Brown, Richard Kimball, Zoran Ristovski

Awarded: \$80,000

Project Title: Development of a Methodology to Measure and Assess Ship Emissions

Project Scheme: Endeavour Fellowships 2015

Chief Investigators: Mandana Mazaheri

Host Institution: Environmental Assessment and Water Research – Spanish Council for Scientific Research (IDAEA-CSIC), Barcelona, Spain

Total funds: \$20,000

Project Title: Comparative analysis of children's exposure to air pollution in urban schools in Spain and Australia

Project Scheme: France-Australia Science Innovation Collaboration (FASIC) Program Early Career Travel Fellowship, Australian Academy of Science 2015

Chief Investigators: Branka Miljevic

Total funds: \$5,000

Project Scheme: IHBI Mid-Career Researcher Grant 2015

Chief Investigators: Mandana Mazaheri

Awarded: \$9,930

Project Title: Community Participation in Air Quality Monitoring and Mitigation: "You Are What You Breathe"

Project Scheme: IHBI Visiting Fellowship 2015

Chief Investigators: Lidia Morawska for Tong Zhu

Awarded: \$4,700

Project Title: Exposure-response relationship to ambient particulate matter

Project Scheme: IHBI Visiting Researcher Scheme 2015

Chief Investigators: Zoran Ristovski for Barbara D'Anna

Awarded: \$4,500

Project Title: Does ageing of diesel exhaust particles in the atmosphere increase their toxicity?

Project Scheme: IHBI Sponsorship Scheme 2015

Chief Investigators: Wendy Miller and Lidia Morawska

Awarded: \$3,000

Project Title: 7th International Conference on Energy and Environment of Residential Buildings

7. Other Public Sector / New Consultancy Research Projects Commenced

Project Title: Investigation of dioxin and furan emissions generated by diesel powered generators

Funded By: uPOP program in collaboration with ENTOX – UQ 2015

Awarded: \$10,000

Chief Investigators: Svetlana Stevanovic, Phong Thai

Project Title: Investigation of engine performance and combustion emissions of diesel and biodiesel with an additive

Funded By: Colin Francis Tirrel 2015

Awarded: \$40,000

Chief Investigators: Thomas Rainey, Svetlana Stevanovic

8. Collaboration with WHO

Lidia Morawska

- Attended by invitation as an expert on air pollution, to participate in the Second Meeting of the Housing & Health Guidelines Development Group which was held in Morges, Switzerland from the 13-15 July 2015.
- Attended by invitation as an expert on air pollution, to participate in and chair the Second Meeting of the WHO Global Platform on Air Quality and Health in Geneva, Switzerland from the 18-20 August 2015.
- Attended by invitation as an expert on air pollution, to participate in the WHO Expert Meeting: Consultation on priorities for the update of the WHO Global Air Quality Guidelines which was held in Bonn, Germany from the 29 September 2015 – 1 October 2015.

9. Conference Presentations (Keynote)

Lidia Morawska

Gave an invited presentation in the special session '**Commuter air quality in rail subway systems: current understanding and future mitigation**' of the **SETAC Annual Meeting** in Barcelona, Spain, 6 May 2015. Presentation: *Public transport and infection spread: is this a problem?*

Gave an invited Keynote Presentation at the **11th Annual ANZAA Workshop (Australia and New Zealand Aerosol Assembly (ANZAA), CASANZ SIG)** in Newcastle, NSW Australia, which was held from the 22-24 July 2015. Presentation: *Particulate matter and human health.*

Gave an invited Keynote Presentation at the **Ventilation 2015 Conference** in Shanghai, China held from the 26-28 October 2015. Presentation: *Will future smart buildings ensure good indoor air quality?*

Gave an invited Keynote Presentation at the **2015 Annual Workshop on Environmental Simulation and Pollution Control** from the 2-3 November 2015 at the Tsinghua University, Beijing, China. Presentation: *Air Quality and Human Health.*

10. Presentations - Other

Lidia Morawska

Gave three invited talks at the **Technion – Israel Institute of Technology** from the 2-6 February 2015 on the following topics: Presentation 1: *Urban air pollution: trends and challenges*; Presentation 2: *Approaches to evaluation of exposures to nanoparticles*; Presentation 3: *The dynamics of indoor aerosols: what is important, where, when and why*.

Gave an invited Presentation at the **Technion AU Meeting** held on the 15 October 2015 in Sydney, NSW. Presentation: *Air Quality and its Impact on Human Health and the Environment*.

Gave an invited presentation at the **NSW Office of Environment and Heritage Meeting** held on the 15 October 2015 in Sydney, NSW. Presentation: *Global developments: new tools for concentration and exposure assessment and the likely trends in air quality health guidelines*.

11. Activities – Other

None to mention.

12. Media Appearances

Lidia Morawska

Many media appearances / interviews, for example:

- Outstanding Women in Queensland Science, 4 March 2015.

The link:

<https://www.facebook.com/qldscience/photos/a.251660768229205.61868.205736396154976/849745518420724/?type=1&theater>

Zoran Ristovski

- Antarctica Voyage: “A giant floating lab is about to find out how the Southern Ocean regulates climate”, 9 March 2015.

The link: <http://www.sciencealert.com/a-giant-floating-laboratory-is-about-to-find-out-how-the-southern-ocean-regulates-climate>

Rohan Jayaratne

- “QUT researchers find charged particles more common near major highways”, ABC Science Online, The Age, 26 May 2015.

The link, The Age: <http://www.theage.com.au/queensland/qut-researchers-find-charged-particles-more-common-near-major-highways-20150525-gh9f5k>

The link, Brisbane Times: <http://www.brisbanetimes.com.au/queensland/qut-researchers-find-charged-particles-more-common-near-major-highways-20150525-gh9f5k>

- “Roadside air can be more charged than under a high-voltage power line”, QUT News, 28 May 2015. The link: <https://www.qut.edu.au/news/news?news-id=90137>
- “Study comparing the air beside busy roads to that under high voltage power lines”, ABC Radio, 29 May 2015.

13. Visitors

- Professor Tobias Schripp, *Visiting Research Academic*, Fraunhofer Wilhelm-Klauditz-Institute (WKI), Germany, 5-30 January 2015.
- Ms Ibor Rivas Lara, *Visiting Research Student*, CRAEL, Barcelona, Spain, 15 January – 14 April 2015.
- Ms Katarzyna Stefańczyk, *Visiting Exchange Student*, Warsaw University of Technology, Poland, 8 February – 30 June 2015.
- Associate Professor Karel Frana, *Visiting Research Academic*, Technical University of Liberec, Czech Republic, 23-27 February 2015.
- Mr Bastien Maumy, *Visiting Research Student*, L'Ecole des Mines Albi-Carmaux, France, 1 May – 24 August 2015.
- Mr Illies Cherqui, *Visiting Research Student*, L'Ecole Nationale Supérieure des Techniques Industrielles et des Mines d'Albi, France, 4 May – 21 August 2015.
- Ms Valeria Rizza, *Visiting Research Student*, University of Cassino, Italy, 1 September 2015 – 1 September 2016.
- Professor Barak Fishban, *Visiting Research Academic*, Technion Institute of Technology, Israel, 1 July - 31 August 2015
- Dr Fernanda Fuoco, *Visiting Research Fellow*, University of Cassino, Italy, 1 July – 20 December 2015.
- Professor Boguang Wang, Deputy Director, Institute of Atmospheric Environmental Safety and Pollution Control, *Visiting Research Academic*, Jinan University, Guangzhou, 15 July 2015 – 12 February 2016.
- Professor Wei Wang, *Visiting Research Academic*, Anhui Jianzhu University, China, 21 October 2015 – 30 September 2016.
- Adjunct Professor Tunga Salthammer, Fraunhofer Wilhelm-Klauditz-Institute (WKI), Germany, 11 November – 11 December 2015.
- Professor Susana Muñoz, *Visiting Research Academic*, Laboratório de Ecotoxicologia e Parasitologia Ambiental Escola de Enfermagem de Ribeirão Preto
Universidade de São Paulo, 10-14 December 2015