

**CURRICULUM VITAE**  
**BUDDHI PUSHPAWELA**

**EMPLOYMENT**

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- Aug 11, **Clinical Assistant Professor.**  
2021 Department of Physics and Astronomy, The University of Alabama in Huntsville, USA  
onwards
- Aug 2019 - **Postdoctoral Scholar.**  
Aug 2021 Division of Chemistry and Chemical Engineering, California Institute of Technology, USA  
Supervisor: Prof. Richard C. Flagan
- Sep 2018 - **Assistant Professor of Physics and Computer Science.**  
Dec 2018 Lane College, USA

**EDUCATION**

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- 2015-2018 **Doctor of Philosophy (PhD).**  
Queensland University of Technology, Australia  
Dissertation: "The Formation and Characteristics of New Particles in the Atmosphere"  
Supervisors: Dr. Rohan Jayaratne, Prof. Lidia Morawska, and Prof. Zoran Ristovski  
Research Direction: Environmental Technology and Aerosol Physics
- 2012-2014 **Preparing Future Faculty (PFF) Certificate Program.**  
University of Cincinnati, USA
- 2008-2011 **Master of Science, Physics.**  
University of Cincinnati, USA  
Project: "Study of  $D^0 - \overline{D^0}$  mixing parameters using a time dependent amplitude analysis of  $D^0$  to  $K\pi\pi_0$ "
- 2001-2006 **Bachelor of Science, Special Degree in Physics, First Class Honors.**  
University of Peradeniya, Sri Lanka  
Minor: Computer Science, Mathematics  
Project: "Conductivity and thermal characterization of  $P(EO)_8LiClO_4$  polymer electrolyte with  $ZrO_2$  and  $ZrSiO_4$  ceramic fillers"

## AWARDS AND HONORS

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### Awards:

- 2018 **University Outstanding Doctoral Thesis Award 2018.**  
Award for the best PhD thesis, Science and Engineering Faculty, Queensland University of Technology, Australia, nominated by external examiners
- 2018 **QUT High Achiever Higher Degree Research (HDR) Student 2018 - June Award.**  
Award for the best PhD research student, Science and Engineering Faculty, Queensland University of Technology, Australia
- 2005/2006 **University Award for Academic Excellence.**  
Department of Physics, University of Peradeniya, Sri Lanka

### Travel Grants:

- 2019 **CTWF-2019, 18th CTWF International Symposium on Aerosol and Climate Change, Beijing, China.**  
Travel grant from Institute of Atmospheric Physics, Chinese Academy of Sciences, China
- 2019 **Invited Visit for the SORPES station (Aerosol Laboratory), Nanjing University, Nanjing, China.**  
Travel grant from School of Atmospheric Sciences, Nanjing University, China
- 2018 **IAC-2018, International Aerosol Conference, St. Louis, Missouri, USA.**  
Travel grant from Queensland University of Technology, Australia
- 2017 **EAC-2017, European Aerosol Conference, Zurich, Switzerland.**  
Travel grant from Queensland University of Technology, Australia

### Scholarships:

- 2015-2018 **QUT Postgraduate Research Award.**  
Queensland University of Technology, Australia
- 2015-2018 **QUT Higher Degree Research Tuition Fee Sponsorship.**  
Queensland University of Technology, Australia
- 2008-2014 **Full Academic, University Graduate Scholarship.**  
University of Cincinnati, USA
- 2008-2014 **Graduate Teaching/Research Assistantship.**  
University of Cincinnati, USA

## RESEARCH EXPERIENCE

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### Research Projects:

Aug 2019 - **Projects at Caltech.**

- July 2021 (4). Focuses on community and personal protection of astronauts during long spaceflight missions - joint project with NASA JPL.  
(3). Focuses on quantifying the performance of respirators and face masks as a function of particle size for both inhalation and exhalation.  
(2). Develop a system with vibrating orifice aerosol generator to measure the scattering pattern, and study the effect of different bubble generation rate on mie scattering  
(1). Focuses on development, characterization, and testing of lightweight and low power instruments for measurement of fine particles in the air.

July 2015 - **Projects at QUT.**

- July 2018 (6). Study on indoor air quality.  
(5). Study of the influence of wind speed on new particle formation (NPF) event in an urban environment.  
(4). Study of the key differences when using different instruments to measure particle formation and growth events in an urban environment.  
(3). Study of haze events and NPF events in Beijing.  
(2). Study of the characteristics of NPF events such as formation rates and growth rates, and the factors controlling new particle formation events in diverse environments.  
(1). Study on relative contribution of ion-induced nucleation on NPF in an urban environment.

### Research Collaboration:

2021- **University of California, Riverside and The George Washington University, Washington D.C.**  
Present

Project on fabricated electrospun nanofibrous membranes and bioaerosol.

2020- **NASA Jet Propulsion Laboratory (JPL).**  
Present

Project on community and personal protection of Astronauts during long spaceflight missions.

2017- **Institute of Atmospheric Physics, Chinese Academy of Sciences and Industrial Technology Institute, Sri Lanka.**  
Present

Project on investigation of droughts, rainfall, and diurnal temperature variation in Sri Lanka and South Asian region.

2016-2017 **Chinese Research in Atmospheric and Environmental Sciences.**  
Project on new particle formation and haze events in Beijing air - winter campaign.

### Grant proposals:

2020 **President's and Director's Research and Development Fund Proposal 2021.**

Project on Community and Personal protection for Astronauts during Long Spaceflight Missions - Joint Proposal NASA JPL and Caltech.

2020 **R21 proposal for Exploratory/Development research grant program and development of biomedical technologies for Corona virus Disease 2019.**

Project on technologies for protecting healthcare workers, first responders, and caregivers, and high-confidence disinfection technologies.

### PEER-REVIEWED JOURNAL PAPERS

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#### Journal Papers (Under review):

- (13) Pushpawela, B., Amanatidis, S., Huang, Y., Flagan, R.C., 2021. "Variability of the performance of facemasks".  
*Aerosol Science and Technology*
- (12) Shelton, S., Pushpawela, B., Liyanage, G., 2021. "Long-term trend in the diurnal temperature range over Sri Lanka from 1985-2017 and its association with total cloud cover and rainfall".  
*Journal of Atmospheric and Solar-Terrestrial Physics*
- (11) Shelton, S., Pushpawela, B., 2021. "Seasonal dependence of rainfall extremes and their variability in Mahaweli river basin Sri Lanka".  
*Journal of Earth System Science*

#### Journal Papers (Published):

- (10) Amanatidis, S., Huang, Y., Pushpawela, B., Schulze, B., Ward, R., Seinfeld, J.H., Hering, S.V., Flagan, R.C., 2021. "Efficacy of a portable, moderate-resolution, fast-scanning DMA for ambient aerosol size distribution measurements".  
*Atmospheric Measurement Techniques*, 14(6), 4507-4516
- (9) Shelton, S., Ogou, F., Pushpawela, B.,\* 2020. "Spatial-temporal variability of drought during two cropping seasons in Sri Lanka and its possible mechanism".  
*Asia Pacific Journal of Atmospheric Sciences*, 1-18, \*corresponding author
- (8) Pushpawela, B., Jayaratne, R., Morawska, L., 2018. "The influence of wind speed on new particle formation events in an urban environment".  
*Atmospheric Research*, 215 (2019), 37-41

- (7) **Jayaratne, E.R., Ling, X., Pushpawela, B., Morawska, L., 2017. "Experimental determination of the dispersion of ions from a point source in the environment".**  
*Environmental Technology*, 40 (10), 1213-1222
- (6) **Pushpawela, B., Jayaratne, R., Morawska, L., 2018. "Differentiating between particle formation and growth events in an urban environment".**  
*Atmospheric Chemistry and Physics*, 18, 11171-11183
- (5) **Pushpawela, B., Jayaratne, R., Morawska, L., 2018. "Temporal distribution and other characteristics of new particle formation events in an urban environment".**  
*Environmental Pollution*, 233 (2018), 552-560
- (4) **Jayaratne, R.\*, Pushpawela, B.\*, He, C., Li, H., Gao, J., Chai, F., Morawska, L., 2017. "Observations of particles at their formation sizes in Beijing, China".**  
*Atmospheric Chemistry and Physics*, 17, 8825-8835, \*Joint first authors
- (3) **Pushpawela, B., Jayaratne, R., Nguy, A., Morawska, L., 2017. "Efficiency of ionizers in removing airborne particles in indoor environments".**  
*Journal of Electrostatics*, 90 (2017), 79-84
- (2) **Jayaratne, E.R., Pushpawela, B., Morawska, L., 2016. "Temporal evolution of charged and neutral nanoparticle concentrations during atmospheric new particle formation events and its implications for ion induced nucleation".**  
*Frontiers of Environmental Science and Engineering*, 10(5), p.13
- (1) **Jayaratne, E.R., Pushpawela, B., Ling, X., Morawska, L., 2016. "First use of a neutral cluster and air ion spectrometer in Australia".**  
*Air Quality and Climate Change*, 50(3)

## CONFERENCE PAPERS & ORAL PRESENTATIONS

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### Conference Papers (Accepted):

- (15) **B Pushpawela, S Amanatidis, Y Huang, RC Flagan, (2021). "Variability of the performance of facemasks".**  
AAAR-2021, American Association for Aerosol Research Annual Conference, Albuquerque, NM, USA (October 18-22, 2021)

- (14) **P Chea, B Pushpawela, R Ward, RC Flagan, (2021). "Influence of flow rates on pressure drop and penetration for various masks".**  
AAAR-2021, American Association for Aerosol Research Annual Conference, Albuquerque, NM, USA (October 18-22, 2021)

**Conference Papers (\*denotes conference papers presented by myself):**

- (13) **B Pushpawela\*, R Jayaratne, L Morawska, (2019). "Characteristics of new particle formation events in Brisbane, Australia".**  
CTWF-2019, 18th CTWF International Symposium on Aerosol and Climate Change, Beijing, China (July 15, 2019)
- (12) **S Shelton, B Pushpawela, BMP Sinhakumar, (2019). "Influence of southwest monsoon rainfall on streamflow of Mahaweli River in Sri Lanka".**  
IWA Water and Development Congress and Exhibition, Colombo, Sri Lanka (December 1-5, 2019)
- (11) **B Pushpawela\*, R Jayaratne, L Morawska, (2018). "Temporal distribution of new particle formation events in Brisbane, Australia" .**  
IAC-2018, International Aerosol Conference, St. Louis, Missouri, USA (September 7, 2018)
- (10) **R Jayaratne, B Pushpawela\*, L Morawska, H Li, J Gao, ( 2018). "New particle formation and severe haze events in Beijing, China".**  
IAC-2018, International Aerosol Conference, St. Louis, Missouri, USA (September 6, 2018)
- (9) **B Pushpawela\*, R Jayaratne, L Morawska, (2017). "The formation rate of secondary particles in Brisbane".**  
CASANZ-2017, 23rd Biennial International Clean Air and Environment Conference, Brisbane, Australia (October 17, 2017)
- (8) **B Pushpawela\*, A Nguy, R Jayaratne, L Morawska, (2017). "Efficiency of an ionizer in removing airborne particles".**  
EAC-2017, European Aerosol Conference, Zurich, Switzerland (August 29, 2017)
- (7) **R Jayaratne, B Pushpawela\*, L Morawska, (2017). "Relative formation times of charged and neutral particles in an urban environment".**  
EAC-2017, European Aerosol Conference, Zurich, Switzerland (August 29, 2017)
- (6) **R Jayaratne, B Pushpawela, L Morawska, (2016). "Observation with a NAIS in Beijing - A brief summary of a joint study conducted by ILAQH, QUT and CRAES, Beijing".**  
ACC-AQSM-2016, Annual conference of the Australia-China Center for Air Quality Science and Management, Shanghai, China (October 20-22, 2016)

- (5) **B Pushpawela\*, R Jayaratne, L Morawska, (2016).** "The balance between charged and neutral particles and clusters in the Brisbane airshed".  
ANZAA-2016, 12th Annual Australia and New Zealand Aerosol Assembly workshop, Brisbane, Australia (August 4-5, 2016)
- (4) **R Jayaratne, B Pushpawela, L Morawska, (2016).** "First observations of new particle formation in Beijing using a neutral cluster and air ion spectrometer".  
ANZAA-2016, 12th Annual Australia and New Zealand Aerosol Assembly workshop, Brisbane, Australia (August 4-5, 2016)
- (3) **A Nguy, B Pushpawela, R Jayaratne, L Morawska, (2016).** "Efficiency of an ionizer in cleaning airborne particles".  
ANZAA-2016, 12th Annual Australia and New Zealand Aerosol Assembly workshop, Brisbane, Australia (August 4-5, 2016)
- (2) **B Pushpawela\*, R Jayaratne, L Morawska, (2016).** "Particle formation events & severe pollution events in Beijing".  
Nanotechnology & Molecular Science HDR Symposium, International Laboratory for Air Quality and Health, Queensland University of Technology, Australia (February 16, 2016)
- (1) **BGH Pushpawela, HMJC Pitawala, VA Seneviratne, MAKL Disanayake, (2006).** "The effect of  $ZrO_2$  nano fillers on the ionic conductivity of  $PEO : LiClO_4$  polymer electrolytes".  
University of Peradeniya Research Sessions, Sri Lanka (November 30, 2006)

## INVITED TALKS AND PRESENTATIONS AT OTHER MEETINGS

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### Invited talks:

- (15) **Introduction to Aerosols (1.5 hour talk).**  
Seton Hall University, New Jersey, USA (July 16, 2021)

### Presentations:

- (14) **Environmental effects on ions and charged particles.**  
International Laboratory for Air Quality and Health, Queensland University of Technology, Australia (July 14, 2016)
- (13) **New Particle Formation in Beijing Air - Winter Campaign, Measurement, and Modeling.**  
ACC-AQSM-2015, Annual conference of the Australia-China Center for Air Quality Science and Management, International Laboratory for Air Quality and Health, Queensland University of Technology, Australia (December 1-2, 2015)

- (8-12) **Updates of the study of  $D^0 - \overline{D^0}$  mixing parameters using a time dependent amplitude analysis of  $D^0$  to  $K\pi\pi_0$ .**  
 BABAR collaboration meetings and Physics Jamboree, SLAC national accelerator laboratory, Stanford University, USA  
 (• September 4, 2014 • May 8, 2014 • September 25, 2013 • October 16, 2012 • January 25, 2012)
- (3-7) **Progress of the study of  $D^0 - \overline{D^0}$  mixing parameters using a time dependent amplitude analysis of  $D^0$  to  $K\pi\pi_0$ .**  
 Department of Physics, University of Cincinnati, USA  
 (• April 1, 2015 • April 18, 2014 • April 15, 2013 • April 2, 2012 • December 5, 2011)
- (2) **Conductivity and thermal characterization of  $P(EO)_8LiClO_4$  polymer electrolyte with  $ZrO_2$  and  $ZrSiO_4$  ceramic fillers.**  
 Department of Physics, University of Peradeniya, Sri Lanka (April 5, 2006)
- (1) **Time line of Physicists.**  
 Department of Physics, University of Peradeniya, Sri Lanka (March 30, 2005)

## TEACHING EXPERIENCE

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### Undergraduate Research Students Supervised:

- 2021 **Rouline Dukuly, Chemical Engineering, Stanford University.**  
 Project on "Mannequin Test of Particle Filtration Efficiency and Pressure Drop of Face masks Used to Curb the Airborne Transmission of COVID-19" under "Summer Undergraduate Research Fellowship Program (SURF)"
- 2021 **Peter Chea, Chemical Engineering, Caltech.**  
 Senior thesis on "Evaluation of Flow Rate and Leakage on Mask Effectiveness and Investigation of Double Masks"
- 2020 **Albert Nazeri, Division of Geological and Planetary Sciences, Caltech.**  
 Senior thesis on "Liquid-Induced Discharge of Polypropylene Microfiber Electret Filters" - contributed for particle penetration and pressure drop measurements

### Courses taught:

Sep 2018 - **Assistant Professor of Physics and Computer Science.**  
 Dec 2018 **Lane College, USA**

- Foundation of Computing
- Programming II
- Data Structures and Algorithms
- Data communication and Computer Networking



- July 2015 - **Graduate Teaching/Research Assistant.**  
 July 2018 **Science and Engineering Faculty, Queensland University of Technology, Australia**
- Energy in Engineering Systems (Calculus based) - lab sections
  - General Physics I and II (Algebra based) - lab and recitation sections
- Sep 2012 - **Instructor, Preparing Future Faculty.**  
 Sep 2014 **University of Cincinnati, USA**
- General Physics I (Algebra based) course for a class of 100 students using "flipped" classroom teaching method (Mentor-Dr. Mark Plano Clark)
- Sep 2008 - **Graduate Teaching Assistant.**  
 Sep 2012 **Department of Physics, University of Cincinnati, USA**
- General Physics I and II (Algebra based) - lab and recitation sections
  - College Physics I and II (Calculus based) - lab and recitation sections
  - Honors Courses (Physics for Engineers, Astronomy) - recitation sections
- Nov 2006 - **Teaching Assistant.**  
 Feb 2008 **Department of Physics, University of Kelaniya, Sri Lanka**
- Thermodynamics for a class of 100 students
  - Solid State Physics for a class of 100 students
  - General Physics I and II - lab sections
  - Solid State Physics - recitation sections
  - Thermodynamics - recitation sections
  - Physics of Waves and Optics - recitation sections
  - Modern Physics - recitation sections
- June 2006 - **Instructor.**  
 Aug 2006 **Department of Computer Science and Engineering, Faculty of Engineering, University of Moratuwa, Sri Lanka**
- Microsoft Office - lab sections
  - Matlab - lab sections
  - Web Designing - using HTML - lab sections

## PROFESSIONAL SERVICE AND MEMBERSHIP

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### Service:

- 2020 **Essential worker, Facemask testing at Caltech during lockdown.**  
 Tested the performance of different kinds of respiratory protection masks ( $\approx 300$  masks) for Caltech during the lockdown period to minimize the spread of COVID-19 within the community
- 2020 **Invited Judge, AAAR student posters competition 2020, USA.**  
 Judge for the American Association for Aerosol Research 2020 conference

- 2020-2021 **Safety Officer, Flagan laboratories at Caltech.**  
Division of Chemistry and Chemical Engineering, California Institute of Technology, USA
- 2019- Present **Associate Editor for Atmosphere in "Journal of Geophysics".**  
<https://geophysicsjournal.com>
- 2018 **10-block project at Lane.**  
Project for economically disadvantaged kids in high schools organized by Lane College.
- 2016-2020 **Assistant to Editorial Board of "Science of the Total Environment (STOTEN)" journal.**  
under Associate Editor Prof. Lidia Morawska
- 2017 **Student Coordinator, 23rd Biennial International Clean Air and Environment Conference (CASANZ) Conference, Australia.**  
Event organized by CASANZ conference
- 2016 **Internal Assessor for ENN 599, Master's students projects presentations, QUT.**  
Event organized by Queensland University of Technology
- 2016 **Student Chair, ANZAA, Australia New Zealand Aerosol Assembly workshop, Australia.**  
Event organized by CASANZ conference
- 2015 **Volunteer, ACC-AQSM, Annual Conference of the Australia-China Center for Air Quality Science and Management 2015, Australia.**  
Event organized by International Laboratory for Air Quality and Health, Queensland University of Technology
- 2015 **Invited Judge, URSC+PRaISE Conference 2015, University of Cincinnati, USA.**  
Judge for the conference "Undergraduate Research, Scholarly Endeavors, & Creative Practice & Presentations of Research and Innovation/Scholarly Endeavors"
- 2012-2014 **Volunteer Judge, UC Science and Engineering Expo 2012, 2013, and 2014, University of Cincinnati, USA.**  
Official Event of the Ohio Academy of Science held once a year
- 2008-2015 **Member, Graduate Association for Teaching Enhancement and Graduate Student Governance Association.**  
Association affiliated to University of Cincinnati, USA
- 2010 **Organizing Committee, BABAR Particle Physics Jamboree 2010, University of Cincinnati, USA.**  
Particle Physics conference organized by BABAR Collaboration

**Membership:**

2019- **AAAR.**  
Present The American Association for Aerosol Research

2014-2018 **APS.**  
American Physical Society

2010- **BABAR collaboration.**  
Present Particle Physics collaboration

## PROFESSIONAL DEVELOPMENT

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### Courses/Workshops:

2021 **The AAAR Lecture Series.**

Lecture series organized by the American Association for Aerosol Research.

2020 **Airborne Transmission of SARS CoV 2 - a Virtual Workshop.**

The National Academies of Science, Engineering and Medicine.

2019 **18th CTWF International Training Workshop on Atmospheric Aerosol and Climate Change.**

Institute of Atmospheric Physics, Chinese Academy of Sciences, China

2016 **Powerpoint Poster Training Workshop.**

Queensland University of Technology, Australia

2016 **Endnote Workshop.**

Queensland University of Technology, Australia

2015 **Advanced Information Research Skills Workshop.**

Queensland University of Technology, Australia

2012–2014 **Workshops under PFF Program, University of Cincinnati.**

Topics:

(11) Teaching strategies for large enrollment classes

(10) Teaching critical thinking

(9) Inclusion and diversity in higher education

(8) Learner centered teaching

(7) Teach me to teach pedagogical preparation seminar

(6) From a passionate teaching assistant to become a professor

(5) Pedagogy, blackboard and efficiency in search of the perfect cocktail

(4) Cheating in the classroom

(3) Flipped classroom at UC

(2) Introduction to wordpress for eportfolios

(1) Writing across the curriculum & writing in the discipline applies to your field and your classroom

- 2011-2012 **Graduate Seminar in Physics Education.**  
Department of Physics, University of Cincinnati, USA
- 2011-2012 **Modeling Instructions Teaching Workshop.**  
Department of Physics, University of Cincinnati, USA
- 2005-2006 **Intern, Research Training Program.**  
Industrial Development Board, Sri Lanka

## REFERENCES

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- Prof. Richard Flagan  
McCollum/Corcoran Professor of Chemical Engineering and Environmental Science and Engineering  
California Institute of Technology, USA.  
Email: flagan@caltech.edu
- Dr. Rohan Jayaratne  
Senior Research Scientist, International Laboratory of Air Quality and Health (ILAQH),  
Faculty of Science, School of Earth and Atmospheric Sciences  
Queensland University of Technology, Australia.  
Email: r.jayaratne@qut.edu.au
- Prof. Lidia Morawska  
Distinguished Professor and Director, International Laboratory of Air Quality and Health (ILAQH),  
Faculty of Science, School of Earth and Atmospheric Sciences  
Queensland University of Technology, Australia.  
Email: l.morawska@qut.edu.au
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Professor and Director, Department of Mathematics and Computer Science,  
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