P. S. GANESH SUBRAMANIAN

EDUCATION

Ph.D. in Environmental Engineering and Science (EES) *Aug 2020 –*
University of Illinois at Urbana-Champaign (UIUC) *CGPA : 4.0/4.0*

M.S. in Earth and Environmental Science *Jun 2019*
Indian Institute of Science (IISc), Bangalore *CGPA : 6.4/8.0; First Class*

B.Sc.(Research) in Earth and Environmental Science *Jun 2018*
Indian Institute of Science, Bangalore *CGPA : 6.3/8.0; First Class*

RESEARCH INTERESTS

Ambient and Indoor Air Quality, Health Effects of Particulate Matter (PM)

EMPLOYMENT HISTORY

Graduate Research Assistant (RA), UIUC *Jan 2022 –*

Graduate Teaching Assistant (TA), UIUC *Spring 2022, 25*

Project Assistant, IISc *Jun 2019 – Mar 2020*

RESEARCH EXPERIENCE

Ph.D. Dissertation Title: Evaluation of the emission rates, oxidative potential, and chemical composition of PM emitted by indoor sources and their implications on human exposure and health.
(PIs: Prof. Vishal Verma, Prof. Brent Stephens, Prof. Thanh. H. Nguyen, Prof. Sheena Martenies)

Ph.D. Dissertation Research

- Evaluating the size-resolved emission rates, chemical composition, and oxidative potential (OP) of PM from household emission sources. (ongoing)
- Characterized the sources and sinks of the OP of PM emitted from residential sources.
- Discerned the influence of residential characteristics on the chemical and oxidative properties PM.
- Characterized of the chemical composition and OP of PM emitted from common indoor sources.
- Evaluated the influence of human activities and occupancy on the emission of indoor particles from respiratory and non-respiratory sources.

Projects as a Collaborator during Ph.D.

- Quantified the chemical composition, emission rates, and OP of PM emitted from tobacco and non-tobacco based Indian cigarettes.
- Quantified the chemical composition and OP of residential PM, to discern the relationship between PM−OP and inflammation in children.
- Designed the aerosol experimental workflow, and quantified the particle deposition rates in a project to elucidate the inactivation mechanisms of respiratory coronavirus.
- Built a semi-automated instrument and measured the OP (using the instrument) of PM collected from different regions globally in multiple different projects.
- Development of a semi-automated instrument for multi-sample bioaerosol collection.
- Performed experiments to demonstrate the emissions of mask-fibre aerosols from surgical masks.

Research Experience during M.S.

- Evaluated the feasibility of using plasma-activated water (PAW) as an alternative nitrogen supplement for agricultural applications.
- Evaluated the performance of a decentralized graywater treatment and recycling plant at a school in rural India.
- Designed a plasma electrode to generate PAW, quantified its chemical composition and demonstrated its applicability in selective treatment of cancer cells and as an anti-microbial agent.

Peer–Reviewed Publications

First-authored

[6] ***P.S.G. Subramanian***, Z. Dai, S. Haratian, et al., Oxidative Potential from Common Indoor Sources of Particulate Matter, *Environmental Science & Technology*, 2025.

[5] ***P.S.G. Subramanian***, J.V. Puthussery, Y. Mao, et al., Influence of Human Activities and Occupancy on the Emission of Indoor Particles from Respiratory and Nonrespiratory Sources, *ACS ES&T Air*, 2024.

[4] ***P.S.G. Subramanian***, J. Ananthanarasimhan, P. Leelesh, et al., Plasma-activated water from DBD as a source of nitrogen for agriculture: Specific energy and stability studies, *Journal of Applied Physics*, 2021.

[3] ***P.S.G. Subramanian***, A.V. Raj, P. Jamwal, et al., Decentralized treatment and recycling of greywater from a school in rural India, *Journal of Water Process Engineering*, 2020.

[2] ***P.S.G. Subramanian***, A. Jain, A.M. Shivapuji, et al., Plasma activated water from a dielectric barrier discharge plasma for selective treatment of cancer cells, *Plasma Processes and Polymers*, 2020.

[1] ***P.S.G. Subramanian***, R. Harsha, D.K. Manju, et al., Characterization of plasma activated water for medical Applications, *Advanced Materials Letters*, 2019.

Co-authored

[7] A. Oloo, V. Vo, ***P.S.G. Subramanian***, et al., The association between indoor air pollution and inflammation in children – A scoping review, *Indoor Environments*, 2025.

[6] A. Zhou, ***P.S.G. Subramanian***, S. Naggar, et al., Capsid and genome damage are the leading inactivation mechanisms of aerosolized porcine respiratory coronavirus in various relative humidities, *Applied and Environmental Microbiology*, 2025.

[5] R. Das, ***P.S.G. Subramanian***, N. Koseoglu, et al., Design of Decentralized Water and Wastewater Management and Reuse System for Rural India - Challenges and Opportunities, *Sustainable Water Resource Management*, 2025.

[4] P.A. Dominutti, J-L Jaffrezo, A. Marsal, ..., ***P.S.G. Subramanian***, et al., An interlaboratory comparison to quantify oxidative potential measurement in aerosol particles: challenges and recommendations for harmonisation, *Atmospheric Measurement Techniques*, 2025.

[3] S. Salana, H. Yu, Z. Dai, ***P.S.G. Subramanian***, et al., Relationship among PM2.5 mass, oxidative potential, and cellular toxicity across different continents, *Nature Communications*, 2024.

[2] Y. Aghaei, M.M. Badami, R. Tohidi, ***P.S.G. Subramanian***, et al., The Impact of Russia-Ukraine geopolitical conflict on the air quality and toxicological properties of ambient PM2.5 in Milan, Italy, *Scientific Reports*, 2024.

[1] M. Aldekheel, R. Tohidi, A. Al-Hemoud, ..., ***P.S.G. Subramanian***, et al., Identifying urban emission sources and their contribution to the oxidative potential of fine particulate matter (PM2.5) in Kuwait, *Environmental Pollution*, 2024.

Manuscripts under review, preprints, or preparation

[9] ***P.S.G. Subramanian***, A. Oloo, V. Vo, et al., "Chemical and Oxidative Properties of Indoor PM: Discerning the Influence of Typical Building and Source Characteristics", Under Review, *ACS ES&T Air*.

[8] S. Fazelvalipour, Y. Aghaei, M.M. Badami, .., ***P.S.G. Subramanian***, et al., "Contributions of Tailpipe and Non-Tailpipe Emissions to the Oxidative Potential of Source-Resolved PM10 from Major LDV- and HDV-Dominated Freeways in Los Angeles", Under Review, *Atmospheric Environment*.

[7] Y. Aghaei, M.M. Badami, ***P.S.G. Subramanian***, et al., " Chemical and Toxicological Impacts of the 2025 Southern California Wildfires on Urban Air Quality in Los Angeles", Under Review, *ACS E&ST Air*.

[6] S. Haratian, P.D.C. Chittoo, ***P.S.G. Subramanian***, et al., "An integral approach to quantifying equivalent clean airflow rates of indoor air cleaning devices from pulse injection and decay tests", Under Review, *Building and Environment.*

[5] B. H. Isenor, G Varnaite, C-H. Jeong, ***P.S.G. Subramanian***, et al., "Impacts of the 2023 Canadian Wildfires on the Oxidative Potential of Particulate Matter", Under Review, *ACS ES&T Air.*

[4] Y. Aghaei, M.M. Badami, M. Aldekheel, ..., ***P.S.G. Subramanian***, et. al., Size-Segregated Chemical Composition and Oxidative Potential of Ambient Ultrafine and Accumulation Mode Particles in Los Angeles, *Preprint*, 2025.

[3] A.F. Prada, A. Distler, S. Cheng, ..., ***P.S.G. Subramanian***, et al., Disposable face masks: a direct source for inhalation of microplastics, *Preprint*, 2023.

[2] ***P.S.G. Subramanian***, S. Haratian, M. Heidarinejad, et al., "Characterization of Sources and Sinks of the Oxidative Potential of Particulate Matter Emitted from Household Sources", *in prep.*

[1] S. Kumar, E. Albers, ***P.S.G. Subramanian***, et al., "Use of Low-Cost Air Quality Sensors in support of Individualizing Asthma Care Plans for Pediatric Patients", *in prep.*

CONFERENCE PRESENTATIONS & POSTERS

As Presenter

[6] Influence of Human Activities and Occupancy on the Emission of Indoor Particles from Respiratory and Non-respiratory Sources, Podium Presentation, *American Association for Aerosol Reserach (AAAR) Annual Conference*, Albuquerque, NM, USA, 2024.

[5] Characterization of Sources and Sinks of the Oxidative Potential of Particulate Matter Emitted from Household Sources, Poster Presentation, *AAAR Annual Conference*, Albuquerque, NM, USA, 2024.

[4] Oxidative potential of the particulate matter emitted from common household sources, Podium Presentation, *Indoor Air Conference*, Honolulu, HI, USA, 2024.

[3] Influence of Human Activities and Occupancy on the Emission of Indoor Particles from Respiratory and Non-respiratory Sources, Podium Presentation *Indoor Air Conference*, Honolulu, HI, USA, 2024.

[2] Oxidative Potential of the Particulate Matter Emitted from Common Household Sources, Podium Presentation, *AAAR Annual Conference*, Portland, OR, USA, 2023.

[1] Influence of Human Activities and Occupancy on Emissions of Indoor Particles and Their Potential Contribution to Fomites, Poster, *AAAR Annual Conference, Raleigh, NC, USA*, 2022.

As Contributor

[5] Chemical, Oxidative, and Toxicological Profiles of Fine Ambient Particulate Matter in Alaska, *AAAR Annual Conference*, Albuquerque, NM, USA, 2024.

[4] Constituents of particulate matter in homes of children ages 6−11 living in a micro-urban environment in Illinois, *International Society of Exposure Science (ISES) Annual Conference, Montreal, Canada*, 2024.

[3] Capsid and Genome Damage are the Leading Inactivation Mechanisms of Aerosolized Porcine Respiratory Coronavirus in Various Relative Humidities, *ASM Microbe conference*, Atlanta, GA, USA, 2024.

[2] Are Health Effects of Ambient PM2.5 Proportional to its Mass? Relevance of Toxicity Measurements in Predicting PM2.5 Health Effects, *AAAR Annual Conference*, Portland, OR, USA, 2023.

[1] Oxidative Potential of the Particulate Matter Emitted from Common Household Sources, *ISES Annual Conference, Chicago, IL, USA*, 2023.

Invited Presentation

[1] Discerning the Spatial Trends of PM Oxidative Potential across the Global Scale, Advancing Globally-Distributed Air Quality Monitoring Meeting, Washington University at St. Louis, St. Louis, MO, USA, 2025

TEACHING & MENTORING EXPIRIENCE

Teaching

Teaching Assistant: *Environmental Engineering Laboratory – CEE 449* *Spr. 2022, 25*
Designed laboratory experiments, trained and helped undergraduates with their projects.

Invited Guest Lectures *2023 - 25*
Presented four guest lectures on *Indoor Air Quality* and *Bioaerosol sampling and Analysis* in three different courses; Environmental Engineering (CEE 330), Environmental Engineering Laboratory (CEE 449), and Public Health Engineering (CEE 435) during my Ph.D. at UIUC.

Mentoring Junior Peers

Zhuying Dai, M.S. Student, University of Illinois, Urbana-Champaign *2022 -23*
Tahsina Alam, M.S. Student, University of Illinois, Urbana-Champaign *2022 -24*
Oluchi Nweke, M.S. Student, University of Illinois, Urbana-Champaign *2023 -*
Anson Regi, M.S. Student, University of Illinois, Urbana-Champaign *2024 -*

AWARDS & HONORS

Fellowships

- *ASHRAE Graduate Student Grant in-Aid Award.* *2025 – 26*
- *Air & Waste Management Association Scholarship Award.* *2025*
- *Mavis Future Faculty Fellowship*, UIUC. *2024 – 25*
- *Ravindar K. and Kavita Kinra Fellowship*, UIUC. *2020 – 21*
- *KVPY Fellowship*, to pursue undergraduate and MS degrees for 5 years. *2014 – 19*

Conference Travel Awards

- *Graduate College Conference Presentation Award* to present at the ISES-ISEE conference. *2025*
- *AAAR Student Travel Grant* on two occasions to attend the AAAR annual conference. *2023, 24*
- *Ratcheff Travel Award, UIUC* on seven occasions to present at different conferences. *2021 – 24*

Other Awards

- Winner of the ISES Students and new researchers lightning talk competition. 2025
- Listed in *"Instructors ranked as excellent by the students"* for TA duties, UIUC. *Spring 2022, 25*
- Volunteer for AAAR at UIUC chapter's award-winning *Engineering Open House* exhibit *2023-25*
- *Student Poster Competition Award* (Top 10 of 300+ posters) at the AAAR conference *2024*
- Outstanding Podium-presentation award (1^{st} Position) *EES Symposium*, UIUC. *2023, 24*
- Paper recognized as a top cited article in *Plasma Processes and Polymers*, WILEY. *2020 – 21*

INSTRUMENATATION & RESEARCH SKILLS

Instrumentation (Operation and Maintenance)

Analytical: Spectrophotometer, Spectrofluorometer, Total Organic Carbon Analyzer (TOC), Inductively-Coupled Plasma Mass-Spectrometer (ICP-MS), Ion-Chromatography (IC), pH, Conductivity, and Ion-Selective Electrode probes (ISE).

Aerosol Instrumentation: Scanning Mobility Particle Sizer (SMPS), Optical Particle Sizer (OPS), Dust Trak, High-Volume PM samplers, Cascade Impactors, Bio-Samplers, Biospot-VIVAS, Microbalance, calibration of low-cost sensors (LCS) .

Research

Aerosol Sampling and Analysis: Chemical characterization, toxicological assessments using acellular and cellular OP assays, emission experiments in indoor and controlled-chamber environments.

Semi-Automated Instrument Design: Design and development of semi-automated instruments using programmable syringe-pumps and multi-position valves in tandem, for multi-sample aerosol and bioaerosol collection, OP measurements, multi-step reaction processes, and kinetic studies.

Wet Lab: Wet chemistry, introductory Microbiology, bacterial culturing and counting, cytotoxicity assessments, design of experiments.

Computational Skills: Microsoft Office, LaTeX, basic proficiency in Python, Julia, R, and MATLAB, and Statistical Analysis of Large-Experimental Datasets.

Professional Service & Activities

Reviewing

- Peer-reviewer for the journals, *Journal of Exposure Science and Environmental Epidemiology* and *Aerosol Science and Technology*
- Assisted my PI, as a trainee reviewer for the journals, *Environment International*, *Environmental Science & Technology*, and *ACS ES&T Air*.
- Peer-reviewer of abstracts for the *Joint Annual Meeting of the International Society of Exposure Science and the International Society for Environmental Epidemiology (ISES-ISEE 2025)*

Membership

- American Association for Aerosol Research (AAAR) *2021 –*
- International Society of Indoor Air Quality and Climate (ISIAQ) *2024 –*
- Air & Waste Management Association (A&WMA) *2024 –*
- Association of Environmental Engineering and Science Professors (AEESP) *2024 –*
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) *2025 –*

Other Activities

- Student Judge for podium presentations in the AAAR annual conference *2024*
- Judge for poster presentations in the EES Symposium *2024, 25*

Community Outreach & Extracurricular Activities

University Outreach Activities

- Taught high-school students an introductory class on air quality and air pollution as part of the *Worldwide Youth in Science and Engineering (WYSE) Summer Camp*, UIUC. *2022, 24, 25*
- Trained high-school students to build low-cost aerosol collection devices, and assisted instructors for other laboratory demonstrations as part of the *WYSE Camp*, UIUC. *2022 – 25*
- Moderated a special event at the Environmental Engineering and Science Symposium, 2025 "*Keeping Urbana-Champaign Resilient Together: A dialogue between Community leaders, Civil & Environmental Engineers and Scientists*" *2025*
- Participated in the *Engineering Open House (EOH)*, UIUC, to engage with the community and school students on air-pollution related issues and research conducted to tackle them. *2022 – 25*
- Participated in *Science at the Market* outreach event to engage and inform the local community on atmospheric research done at the university. *2023*
- Taught high-school students an introductory module on wastewater treatment as part of the *What it takes (WIT) Camp*, UIUC *2022*

Volunteering and Service Activities

- Tutored Math and Science to students at *Centennial High School, Champaign* and *UNI High School, Urbana*, one to two times a week as part of the *STEMbassadors Program*, UIUC. *2023 – 24*
- Taught Math and Science to underprivileged public school kids over the weekend as part of the *Notebook Drive Initiative*, IISc. *2016 – 19*
- Volunteer for charitable organizations and service activities (blood donations) during spare time on weekends

Positions of Responsibility

- Secretary of the Indian Graduate Students Association, UIUC *2021 – 22*
- Membership Director of AAAR Student Chapter, UIUC *2021 – 22*
- Member of the EES Graduate Student Advisory Committee, CEE, UIUC *2024 –*
- Superuser for maintaining instruments and training students on using: Spectrophotometer, Spectrofluorometer, TOC analyzer, SMPS, OPS, microbalance, ICP-MS, and EC-OC analyzer *2021 –*