

College of Engineering Biographical Data

University of Illinois at Urbana-Champaign

Department (% appnt):	Civil and Environmental Engineering	Updated:	May 2022
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1. Name:	Verma, Vishal	Birth Date:	4/22/1980	Citizenship:	India
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2. Present Academic Rank:	Assistant Professor	3. Tenure Status:	5A
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4. Administrative Title:

5. Degrees (*field, institution, year awarded*)

1. B.E., Environmental Engineering, Delhi College of Engineering, University of Delhi, India, 2002
2. M.Tech, Environmental Science and Engineering, Indian Institute of Technology (IIT) Bombay, India, 2004
3. PhD, Environmental Engineering, University of Southern California, 2011

6. Academic Positions at U of I and elsewhere (*rank, institution, field, inclusive dates*) (*show % if you hold multiple appointments*)

1. Research Scientist, Georgia Institute of Technology, 2011-2015
2. Assistant Professor, University of Illinois at Urbana-Champaign, 2015-present
3. Visiting Assistant Professor, University of Chile, January 07-January 12, 2018

7. Professional Activities

a. Other Professional Employment (*title, organization, location, inclusive dates*)

b. Major Consulting Activities (*past five years*) (*list organization and location*)

c. Professional Registrations (*field, location, date*)

8. Honors, Recognition, and Outstanding Achievements (*list year*)

a. Teaching

n	Award Name	Citation	Date Awarded
1	Appeared in the List of Teachers Ranked as Excellent (Overall Teaching Effectiveness = 4.6/5.0; Overall Course Quality = 4.6/5.0) by Their Students for the course CEE 545 at UIUC		Spring 2017
2	Appeared in the List of Teachers Ranked as Excellent (Overall Teaching Effectiveness = 4.7/5.0; Overall Course Quality = 4.7/5.0) by Their Students for the course CEE 498 at UIUC		Fall 2017
3	Appeared in the List of Teachers Ranked as Excellent with Outstanding Rating (Top 10% Overall Teaching Effectiveness & Course Quality) by Their Students for the course CEE 545 at UIUC		Spring 2018
4	Appeared in the List of Teachers Ranked as Excellent with Outstanding Rating (Top 10% Overall Teaching Effectiveness & Course Quality) by Their Students for the course CEE 545 at UIUC		Spring 2019
5	Appeared in the List of Teachers Ranked as Excellent with Outstanding Rating (Top 10% Overall Teaching Effectiveness & Course Quality) by Their Students for the course CEE 498 at UIUC		Fall 2019
6	Appeared in the List of Teachers Ranked as Excellent (Overall Teaching Effectiveness = 4.9/5.0; Overall Course Quality = 4.6/5.0) by Their Students for the course CEE 545 at UIUC		Spring 2020
7	Appeared in the List of Teachers Ranked as Excellent with Outstanding Rating (Top 10% Overall Teaching Effectiveness & Course Quality) by Their Students for the course CEE 545 at UIUC		Spring 2021

b. Research

n	Award Name	Citation	Date Awarded
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n	Award Name	Citation	Date Awarded
1	National Science Foundation Early Career Award		February 2019
2	Honorable Mention for the James J. Morgan Environmental Science & Technology Early Career Award from ACS Division of Environmental Chemistry	https://axial.acs.org/2021/01/07/2021-james-j-morgan-winners-announced/	November 2020
3	Center for Advanced Study Fellow for the academic year 2021-22	https://cas.illinois.edu/2021-22-associates-and-fellows	June 2021

c. Public Service

d. Others

n	Award Name	Citation	Date Awarded
1	Student poster competition award won by research M.S. thesis student (Jinlai Wei) in the American Association of Aerosol Research Conference, Raleigh, NC (10% of 300 posters)		October 2017
2	Student travel grant won by PhD student (Joseph V. Puthussery) to attend the American Association of Aerosol Research Conference, Raleigh, NC		October 2017
3	Student poster competition award won by PhD student (Yixiang Wang) for best poster in Materials and Technology Development session at the 24th annual Environmental Engineering and Science Symposium, Urbana, IL.		April 2018
4	Student poster competition award won by PhD student (Haoran Yu) in the American Association of Aerosol Research Conference, Portland, OR (10% of 300 posters)		October 2019
5	Student travel grant won by PhD student (Yixiang Wang) to attend the American Association of Aerosol Research Conference, Portland, OR		October 2019
6	Chester P. Siess Award won by PhD student (Haoran Yu) in the Department of Civil and Environmental Engineering at UIUC		February 2020
7	Mavis Future Faculty Fellowship (MF3) won by PhD student (Joseph V. Puthussery) from Grainger College of Engineering for academic year 2020-2021		May 2020
8	Third place won by PhD student (Joseph V. Puthussery) in University of Illinois at Urbana Champaign Research Live - an annual campus-wide interdepartmental event for presenting research to the public		October 2020
9	Engelbrecht Fellowship won by PhD student (Joseph V. Puthussery) in the Department of Civil and Environmental Engineering at UIUC		January 2021
10	Best Presenter award won by PhD student (Joseph V. Puthussery) in Air Connect 3MT - a campus-wide interdepartmental event organized by the UIUC AAAR student chapter		April 2021
11	Student poster competition award won by PhD student (Haoran Yu) in the virtual American Association of Aerosol Research Conference (10% of 300 posters)		October 2021

9. Web pages

n	Full website URL	Text for link
1	https://cee.illinois.edu/directory/profile/vverma	Faculty profile
2	https://publish.illinois.edu/aerosol-research/	Research website

FACTUAL INFORMATION

A. Resident Instruction and Continuing Education (attach Teaching Activity reports, which covers 10 years)

1. Resident Instruction (verify the information on the appended page for sections in which you had primary responsibility; pencil in corrections)

1. Spring 2016 - CEE545: Aerosol Sampling and Analysis
2. Fall 2016 - CEE498: Public Health Engineering
3. Spring 2017 - CEE545: Aerosol Sampling and Analysis
4. Fall 2017 - CEE498: Public Health Engineering
5. Spring 2018 - CEE545: Aerosol Sampling and Analysis
6. Spring 2019 - CEE545: Aerosol Sampling and Analysis

7. Fall 2019 - CEE498: Public Health Engineering
8. Spring 2020 - CEE545: Aerosol Sampling and Analysis
9. Fall 2020 - CEE498: Public Health Engineering
10. Spring 2021 - CEE545: Aerosol Sampling and Analysis
11. Spring 2022 - CEE449: Environmental Engineering Laboratory (co-taught with Prof. Roland Cusick)

2. Continuing Education (*credit courses only*) (year, course, # of students, delivery method)

n	Course	Year	Number of Students	Delivery Method
1				

3. Other Instructional Activities (*prelim and final exams, course development, short courses, etc.*)

a. Prelim and Final Exams

n	Doctoral Candidate	Prelim Exam Date	Final Exam Date	(Co-)Chair	(Co-)Director
1	Haoran Yu	04/30/2019	02/15/2022		Director
2	Mariam M Fawaz	05/07/2019	06/28/2021	Co-chair	
3	Joseph V Puthussery	09/23/2019	11/11/2021		Director
4	Yixiang Wang	2/17/2020	06/28/2021		Director

b. Course Development

1. Substantially revised the course on Aerosol Sampling and Analysis (CEE 545) for enhancing the field and laboratory experience in Spring 2016.
2. Developed a new course on Public Health Engineering (CEE 498 PHE) in Fall 2016.
3. Submitted the proposal for making CEE 498 PHE permanent as CEE 435: Public Health Engineering in Fall 2020. CEE 435 was successfully approved and is in the UIUC BANNER system- to be offered starting Fall 2023.
4. Substantially revised the course CEE 449: Environmental Engineering Lab (in collaboration with water quality faculty Roland Cusick), for enhancing students' experience related to community air and water sampling, environmental justice, and integrated design in Spring 2022.

c. Short Courses

1. A tutorial on "Aerosol Oxidative Potential Measurements" in the American Association for Aerosol Research Conference, Raleigh, NC, October 16-20, 2017
2. Short course on "ROS activity measurement" in University of Chile, Santiago, Chile, January 10, 2018.
3. Short course on "Building low-cost air samplers" to a group of high school students from various schools in Illinois during UIUC CEE summer camp, 2018

4. Undergraduate Advising

a. Academic Advising (*student name, term, and activity description*)

1. Runran Wang, Undergraduate Research Assistant (CEE Research Experience for Undergraduates), Fall 2015, Spring 2016 and Fall, 2016, Automated Instrument for measuring the reactive oxygen species (ROS) activity of ambient particles
2. Yiwei Xu, Undergraduate Research Assistant (CEE Research Experience for Undergraduates), Spring 2016, Spatiotemporal distribution of air pollutants in Champaign, IL.
3. Dhairav Vakil, Undergraduate Research Student, Independent Study (CEE497), Spring 2016, Developing alternative protocol for running the syringe pumps
4. Yilan Cheng, Undergraduate Research Assistant, Independent Study (CEE 497), Summer 2017, Spatial distribution of chemical components of ambient aerosols in the Midwest US
5. Chen Zhang, Undergraduate Research Assistant (CEE Research Experience for Undergraduates), Summer 2017, Fall 2017, Online instrument for measuring the ROS activity of ambient particles
6. Avin Arefzadeh, Undergraduate Research Assistant (CEE Research Experience for Undergraduates), Summer 2018, Fall 2018 Spatial distribution of aerosol ROS activity in Midwest US.
7. Ian Cornejo, Undergraduate Research Assistant, Summer 2019, Online measurement of ROS activity of ambient aerosols.
8. Yicen Liu, Undergraduate Research Assistant (CEE Research Experience for Undergraduates), Fall 2019, and Independent Study (CEE 497), Spring 2020, Spatial distribution of chemical components of ambient aerosols in the Midwest US
9. Zhuying Dai, Undergraduate Research Assistant, Summer 2022, Evaluation of PM2.5 oxidative potential as a proxy for aerosol toxicity

b. Student Organizations (*list past five years*)

1. Faculty Advisor (2021-2023) for The American Association for Aerosol Research Student Chapter at University of Illinois at Urbana-Champaign (AAAR at UIUC)

c. Design Teams (*past five years*)

d. Other (*individual projects, engineering open house, etc. past five years*)

1. Anshoo Narula, M.S. Research Assistant, 2015. Dithiothreitol method for measuring the oxidative potential of ambient particles
2. Varenya Mehta: M.S. Coursework Student, Independent study (CEE 597), 2017, Online measurement of particulate matter oxidative potential
3. Udit Gupta, M.S. Coursework Student, hourly paid student, 2017, Converging lung fluid and dithiothreitol method for oxidative potential measurement
4. Yiwen Zhang, M.S. Coursework Student, Independent study (CEE597), 2018, Effect on buffer on particle oxidative potential
5. Huawei Zhang, M.S. (3+2 program), Coursework Student, Independent study (CEE 597), 2018, Prevalence of organic-metal complexes in atmospheric particles
6. Participated in the Engineering Open House (UIUC) 2019, for demonstrating the measurement ambient aerosols using simple devices
7. Participated in the Engineering Open House (UIUC) 2022, for demonstrating the operation of automated syringe pumps for atmospheric chemical reactions.

B. Research, Creative, and Other Scholarly Activities

1. Publications

List publications in print or accepted, with authors' names ordered the way they appear on the publications. Provide inclusive page numbers for papers in proceedings and journals. Follow the outline given below for the organization of the list of publications. Within each category place items in chronological order.

- (*) has undergone stringent editorial review by peers
- (**) invited and carries with it prestige and recognition
- (S) based on work as a student
- (W) co-authored with students you supervise
- (!) represents most important contribution of the past decade
- (P) derived from PhD thesis
- (D) co-authored with post-docs

a. Books Authored or Co-Authored

1. Original Editions

2. Revisions

b. Books Edited or Co-Edited

1. Original Editions

2. Revisions

c. Chapters in Books

1. (*)(**)(S)(P) Verma, V., Yu, H., Sioutas, C., Weber, R. J., 2018. Oxidative properties of ambient particulate matter - an assessment of the relative contributions from various aerosol components and their emission sources, *Multiphase Environmental Chemistry in the Atmosphere*, Chapter 19, pp 389-416, DOI: 10.1021/bk-2018-1299.ch019, ACS Symposium Series, Vol. 1299, ISBN13: 9780841233638, eISBN: 9780841233621, Copyright © 2018 American Chemical Society.

d. Monographs (*longer than an article, but shorter than a book*)

e. Articles

1. Articles In Journals

1. (*) (S)(P) Biswas, S., Hu, S.H., Verma, V., Herner, J.D., Robertson, W.H., Ayala, A., Sioutas, C., 2008. Physical properties of particulate matter (PM) from late model heavy-duty diesel vehicles operating with advanced PM and NOx emission control technologies. *Atmospheric Environment*, 42 (22), 5622-5634.

2. (*) (S)(P) Biswas, S., Verma, V., Schauer, J.J., Sioutas, C., 2009. Chemical speciation of PM emissions from heavy-duty diesel vehicles equipped with diesel particulate filter (DPF) and selective catalytic reduction (SCR) retrofits. *Atmospheric Environment*, 43 (11), 1917-1925.
3. (*) (S)(P) Verma, V., Polidori, A., Schauer, J.J., Shafer, M.M., Cassee, F.R., Sioutas, C., 2009. Physicochemical and toxicological profiles of particulate matter in Los Angeles during the October 2007 southern California wildfires. *Environmental Science and Technology*, 43 (3), 954-960.
4. (*) (S)(P) Biswas, S., Verma, V., Schauer, J.J., Cassee, F.R., Cho, A.K., Sioutas, C., 2009. Oxidative potential of semi-volatile and non-volatile particulate matter (PM) from heavy-duty vehicles retrofitted with emission control technologies. *Environmental Science and Technology*, 43 (10), 3905-3912.
5. (*) (S)(P) Verma, V., Ning, Z., Cho, A.K., Schauer, J.J., Shafer, M.M., Sioutas, C., 2009. Redox activity of urban quasi-ultrafine particles from primary and secondary sources. *Atmospheric Environment*, 43 (40), 6360-6368.
6. (*) (S)(P) Moore, K.F., Verma, V., Minguillon, M.C., Sioutas, C., 2010. Inter- and intra-community variability in continuous coarse particulate matter (PM_{10-2.5}) concentrations in the Los Angeles area. *Aerosol Science and Technology*, 44 (7), 526-540.
7. (*) (S)(P) Verma, V., Pakbin, P., Cheung, K.L., Cho, A.K., Schauer, J.J., Shafer, M.M., Kleinman, M.T., and Sioutas, C., 2010. Physicochemical and oxidative characteristics of semi-volatile components of quasi-ultrafine particles in an urban atmosphere. *Atmospheric Environment*, 45 (4), 1025-1033.
8. (*) (S)(P) Verma, V., Shafer, M.M., Schauer, J.J. and Sioutas, C., 2010. Contribution of transition metals in the reactive oxygen species activity of PM emissions from retrofitted heavy-duty vehicles. *Atmospheric Environment*, 44 (39), 5165-5173.
9. (*) Verma, V., Rico-Martinez, R., Kotra, N., King, L., Liu, J., Snell, T., Weber, R.J., 2012. Contribution of water-soluble and insoluble species and their hydrophobic/hydrophilic sub-fractions in the ROS generating potential of ambient atmospheric aerosols. *Environmental Science and Technology*, 46 (20), 11384-11392.
10. (*) Verma, V., Rico-Martinez, R., Kotra, N., Rennolds, C., King, L., Liu, J., Snell, T., Weber, R.J., 2013. Estimating the toxicity of ambient fine aerosols using freshwater rotifer *Brachionus calyciflorus* (Rotifera: Monogononta). *Environmental Pollution*, 182, 379-384.
11. (*) Budisulistiorini, S.H., Canagaratna, M.R., Croteau, P.L., Baumann, K., Edgerton, E.S., Kollman, M.S., Ng, N.L., Verma, V., Shaw, S.L., Knipping, E.M., Worsnop, D.R., Jayne, J.T., Weber, R.J., Surratt, J.D., 2014. Intercomparison of an aerosol chemical speciation monitor (ACSM) with ambient fine aerosol measurements in downtown Atlanta, Georgia. *Atmospheric Measurement Technique*, 7, 1929-1941.
12. (*) Fang, T., Verma, V., Guo, H., King, L. E., Edgerton, E. S., and Weber, R. J., 2014. A Semi-automated system for quantifying the oxidative potential of ambient particles in aqueous extracts using the dithiothreitol (DTT) assay: results from the Southeastern center for air pollution and epidemiology (SCAPE). *Atmospheric Measurement Techniques*, 8, 471-482
13. (*) Verma, V., Fang, T., Guo, H., King, L., Edgerton, E., Peltier, R., Russell, A.J., Weber, R.J., 2014. Reactive oxygen species associated with water-soluble PM_{2.5} in the southeastern United States - spatiotemporal trends and source apportionment. *Atmospheric Chemistry and Physics*, 14, 12915-12930.
14. (*) Verma, V., Fang, T., Lu, X., Nga, N. L., Peltier, R., Russell, A.J., Weber, R.J., 2015. Organic aerosols associated with reactive oxygen species (ROS) generation. *Environmental Science and Technology*, 49 (7), 4646-4656.
15. (*) Verma, V., Wang, Y., El-Affifi, R., Fang, T., Russell, A.J., Weber, R.J., 2015. Fractionating ambient humic-like substances (HULIS) for their reactive oxygen species activity - assessing the importance of quinones and atmospheric aging on particulate matter toxicity. *Atmospheric Environment*, 120, 351-359.
16. (*) Fang, T., Verma, V., Bates, J., Abrams, J., Weber, R.J., 2015. PM 2.5 water-soluble elements in the southeastern United States: automated analytical method development, spatiotemporal distributions, source apportionment, and implications for health studies. *Atmospheric Chemistry and Physics*, 15, 11667-11682.
17. (*) Bates, J. T., Weber, R. J., Abrams, J., Verma, V., Klein, M., Matthew Strickland, Sarnat, S., Fang, T., Chang, H., Mulholland, J., Tolbert, P., Russell, A., 2015. Reactive oxygen species generation linked to sources of atmospheric particulate matter and cardiorespiratory effects. *Environmental Science and Technology*, 49, 13605-13612.
18. (*) Fang, T., Verma, V., Bates, J.T., Abrams, J., Klein, M., Strickland, M.J., Sarnat, S.E. Chang, H.H., Mulholland, J., Tolbert, P.E., Russell, A.G., Weber, R.J., 2016. Oxidative potential of ambient water-soluble PM_{2.5} measured by dithiothreitol (DTT) and ascorbic acid (AA) assays in the southeastern United States: contrasts in sources and health associations. *Atmospheric Chemistry and Physics*, 16 (6), 3865-3879.
19. (*) Tuet, W., Foka, S., Verma, V., Rodriguez, M., Grosberg, A., Champion, J., Ng, N.L., 2016. Dose-dependent intracellular reactive oxygen and nitrogen species (ROS/RNS) production from particulate matter exposure: comparison to oxidative potential and chemical composition. *Atmospheric Environment*, 144, 335-344.
20. (*) Vreeland, H., Schauer, J.J., Russell, A.G., Marshall, J.D., Fushimi, A., Jain, G., Sethuraman, K., Verma, V., Tripathi, S.N., Bergin, M.H., 2016. Chemical characterization and toxicity of particulate matter emissions from roadside trash combustion in urban India. *Atmospheric Environment* 147, 22-30.
21. (*) Shirmohammadi, F., Wang, D., Hasheminassab, S., Verma, V., Schauer, J.J., Sioutas, C., 2016. Oxidative potential of on-road fine particulate matter (PM_{2.5}) measured on major freeways of Los Angeles, CA, and a 10-year comparison with earlier roadside studies. *Atmospheric Environment*, 148, 102-114.
22. (*) Fang, T., Guo, H., Zeng, L., Verma, V., Nenes, A., Weber, R.J., 2017. Highly acidic ambient particles, soluble metals and oxidative potential: A link between sulfate and aerosol toxicity. *Environmental Science and Technology*, 51 (5), 2611-2620
23. (*) Fang, T., Zeng, L., Gao, D., Verma, V., Stefanac, A., Weber, R.J., Guo., 2017. Ambient size distributions and lung deposition of aerosol dithiothreitol-measured oxidative potential: contrast between soluble and insoluble particles. *Environmental Science and Technology*, 51 (12), 6802-6811
24. (*) Gao, D., Fang, T., Verma, V., Zeng, L., Weber, R.J., 2017. A method for measuring total aerosol oxidative potential (OP) with the dithiothreitol (DTT) assay and comparisons between an urban and roadside site of water-soluble and total OP. *Atmospheric Measurement Technology*, 10, 2821-2835.

25. (*) Vreeland, H., Weber, R.J., Bergin, M., Greenwald, R., Golan, R., Russell, A.G., Verma, V., Sarnat, J., 2017. Oxidative potential of PM_{2.5} during Atlanta rush hour: measurements of in-vehicle dithiothreitol (DTT) activity. *Atmospheric Environment*, 165, 169-178
26. (*) Abrams, J. Y., Weber, R. J., Klein, M., Samat, S. E., Chang, H. H., Strickland, M. J., Verma, V., Fang, T., Bates, J. T., Mulholland, J. A., Russell, A. G., and Tolbert, P. E., 2017. Associations between ambient fine particulate oxidative potential and cardiorespiratory emergency department visits. *Environmental Health Perspectives*, 125 (10), 107008, 1-9.
27. (*) (W) (!) **Xiong, Q., Yu, H., Wang, R., Wei, J.**, Verma, V., 2017. Rethinking dithiothreitol-based particulate matter oxidative potential: measuring dithiothreitol consumption versus reactive oxygen species generation. *Environmental Science and Technology*, 51, 6507-6514.
28. (*) Shirmohammadi, F., Lovett, C., Sowlat, M. H., Mousavi, A., Verma, V., Shafer, M. M., Schauer, J. J., and Sioutas, C., 2018. Chemical composition and redox activity of PM_{0.25} near Los Angeles international airport and comparisons to an urban traffic site. *Science of Total Environment*, 610, 1336-1346.
29. (*) (W) (!) **Yu, H., Wei, J., Cheng, Y.**, Subedi, K., and Verma, V., 2018. Synergistic and antagonistic interactions among the particulate matter components in generating reactive oxygen species. *Environmental Science and Technology*, 52, 2261-2270.
30. (*) (W) **Wang, Y.**, Mukherjee, U. K., Plewa, M. J., and Verma, V., 2018. Assessing the cytotoxicity of ambient particulate matter using Chinese hamster ovary (CHO) cells and its relationship with the chemical composition and oxidative potential. *Atmospheric Environment*, 179, 132-141.
31. (*) (W) (!) **Puthussery, J.V., Zhang, C.**, Verma, V., 2018. Development and field testing of an online instrument for measuring the real-time oxidative potential of ambient particulate matter based on dithiothreitol assay. *Atmospheric Measurement Techniques*, 11, 5767-5780.
32. (*) Bates, J.T., Weber, R.J., Verma, V., Fang, T., Ivey, C., Liu, C., Sarnat, S.E., Chang, H.H., Mulholland, J.A., Russell, A.G., 2018. Source impact modeling of spatiotemporal trends in PM_{2.5} oxidative potential across the eastern United States. *Atmospheric Environment*, 193, 158-167.
33. (*) (W) **Wei, J., Yu, H., Wang, Y.**, Verma, V., 2019. Complexation of iron and copper in ambient particulate matter and its effect on the oxidative potential measured in a surrogate lung fluid. *Environmental Science and Technology*, 53, 1661-1671.
34. (*) (W) **Yu, H., Puthussery, J.V.**, Verma, V., 2019. A semi-automated multi-endpoint reactive oxygen species activity analyzer (SAMERA) for measuring the oxidative potential of ambient PM_{2.5} aqueous extracts. *Aerosol Science and Technology*, 54 (3), 304-320.
35. (*) (W) (!) **Puthussery, J.V.**, Singh, A., Rai, P., Bhattu, D., Kumar, V., Vats, P., Furger, M., Rastogi, N., Slowik, J.G., Ganguly, D., Prevot, A.S.H., Tripathi, S.N., Verma, V., 2020. Real-time measurements of PM_{2.5} oxidative potential using dithiothreitol (DTT) assay in Delhi, India. *Environmental Science and Technology Letters*, 7, 504-510.
36. (*) (W) **Wang, Y., Puthussery, J.V., Yu, H.**, Verma, V., 2020. Synergistic and antagonistic interactions between the organic and metallic components of the ambient particulate matter (PM) for the cytotoxicity measured by Chinese Hamster Ovary cells. *Science of Total Environment*, 736, 139511, 1-9.
37. (*) Molina, C., Andrade, C., Manzano, C.A., Toro, A. R., Verma, V., Leiva-Guzman, M.A., 2020. Dithiothreitol-based oxidative potential for airborne particulate matter: an estimation of the associated uncertainty. *Environmental Science and Pollution Research*, 27, 29672-29680
38. (*) (W) Oh, C., Araud, E., **Puthussery, J.V.**, Bai, H., Clark, G., Wang, L., Verma, V., Nguyen, T.H., 2020. Dry heat as a decontamination method for N95 face respirator reuse. *Environmental Science and Technology Letters*, 7, 677-682.
39. (*) (W) Zeng, Y., **Yu, H.**, Zhao, H., Stephens, B., Verma, V., 2021. Influence of environmental conditions on the oxidative potential of size-resolved indoor particulate matter of ambient origin. *Atmospheric Environment*, 255, 118429, 1-9.
40. (*) (W) Ruzic, D.N., Oh, C., **Puthussery, J.V.**, Patel, D., Jeckell, Z., Verma, V., Nguyen, T.H., 2021. A plasma-generating N-95 respirator decontamination unit created from a microwave oven. *Plasma Medicine*, 11 (3), 1-18.
41. (*) (W) **Yu, H., Puthussery, J.V., Wang, Y.**, Verma, V., 2021. Spatiotemporal variability in the oxidative potential of ambient fine particulate matter in the midwestern United States. *Atmospheric Chemistry and Physics*, 21, 16363-16386.
42. (*) (W) **Salana, S., Wang, Y., Puthussery, J.V.**, Verma, V., 2021. A Semi-automated instrument for cellular oxidative potential evaluation (SCOPE) of water-soluble extracts of ambient particulate matter. *Atmospheric Measurement Techniques*, 14, 7579-7593.
43. (*) (W) (!) **Wang, Y., Puthussery, J.V., Yu, H., Liu, Y., Salana, S.**, Verma, V., 2022. Sources of cellular oxidative potential of water-soluble fine ambient particulate matter in the Midwestern United States. *Journal of Hazardous Materials*, 425, 127777, 1-14.
44. (**) (W) Verma, V., **Salana, S.**, 2022. AS&T virtual collection: Toxicity of ambient particulate matter impact of chemical composition, emission sources and atmospheric processes. *Aerosol Science and Technology*, <https://doi.org/10.1080/02786826.2022.2051960>.
45. (*) (W) Kumar, V., Giannoukos, S., Haslett, S.L., Tong, Y., Singh, A., Bertrand, A., Lee, C.P., Wang, D.S., Bhattu, D., Stefanelli, G., Dave, J.S., **Puthussery, J.V.**, Qi, L., Vats, P., Rai, P., Casotto, R., Satish, R., Mishra, S., Pospisilova, V., Mohr, C., Bell, D.M., Ganguly, D., Verma, V., Rastogi, N., Baltensperger, U., Tripathi, S.N., Prévôt, A.S.H., Slowik, J.G., 2022. Real-time chemical speciation and source apportionment of organic aerosol components in Delhi, India, using extractive electrospray ionization mass spectrometry. *Atmospheric Chemistry and Physics*, <https://doi.org/10.5194/acp-2021-1033>

2. Articles In Conference Proceedings

3. Abstracts (in print or accepted)

4. Book Reviews (in print or accepted)

5. Refereed Conference Papers and Presentations

f. Pending Publications

1. (*) (W) **Puthussery, J.V.**, Dave, J., Shukla, A., Gaddamidi, S., Singh, A., Vats, P., Ganguly, D., Rastogi, N., Tripathi, S.N., Verma, V., 2022. Effect of biomass burning, Diwali fireworks, and polluted fog events on the oxidative potential of fine ambient particulate matter in Delhi, India, submitted to Environmental Science and Technology.
2. (*) (W) Zhang, W., **Yu, H.**, Hettiyadura, A., Verma, V., Laskin, A., 2022. Field evidence for enhanced generation of reactive oxygen species in atmospheric aerosol containing quinoline components, submitted to Environmental Science and Technology.
3. (*) (W) **Wang, Y., Salana, S., Yu, H., Puthussery, J.V.**, Verma, V., 2022. On the relative contributions of iron and organic compounds, and their interaction in cellular oxidative potential of ambient PM_{2.5}, submitted to Environmental Science and Technology Letters.
4. Jalali, F. V. Altuwayjiri, A., Pirhadi, M., Verma, V. Ruprecht, A., Eleftheriadis, K. Sioutas, C., 2022. The oxidative potential of particulate matter (PM) in different regions around the world and its relation to air pollution sources, submitted to Environmental Science: Atmospheres.

g.i Invited Lectures and Invited Conference Presentations Since Last Promotion. For candidates for promotion to Professor, a full (career) list of events may be provided (in other section) or, in the interest of brevity, a list of only those events since the last promotion may be provided.

g.ii Other Invited Lectures and Invited Conference Presentations

n	Title	Conference	Location	Year
1	Reactive oxygen species (ROS) activity of ambient particles in an urban environment - an assessment of the relative contributions from various aerosol components	Webinar hosted by US Environmental Protection Agency (EPA) for the Clean Air Research Centers	Atlanta, GA	2012
2	Air pollution and health - An assessment of the relative contributions from various aerosol components and their emission sources		Purdue University, Environmental and Ecological Engineering, IN	2015
3	Toxicological characteristics of ambient particulate matter - An assessment of the relative contributions from various aerosol components and their emission sources		University of Illinois at Urbana Champaign	2015
4	Linking particulate matter to human health: A new paradigm?		Illinois State Water Survey, IL.	2016
5	Oxidative potential of ambient particulate matter and its implications		Illinois Institute of Technology, Department of Civil, Architectural, and Environmental Engineering, Chicago, IL	2016
6	Relating reactive oxygen species generation capability of ambient aerosols to chemical composition and emission sources		Missouri University of Science and Technology Civil, Architectural and Environmental Engineering, MO	2016
7	Oxidative properties of ambient particulate matter - An assessment of the relative contributions from various aerosol components	American Chemical Society (ACS) Fall Meeting	Washington, DC	2017
8	Methods for measuring the oxidative potential of ambient particles	Tutorial hosted by American Association of Aerosol Research	Raleigh, NC	2017
9	Health-relevant metrics for ambient aerosol pollution		University of Chile, Center for Environmental Sciences, Santiago, Chile.	2018
10	On the health effects of ambient particulate matter	Invited presentation for a panel of air pollution researchers from Nanyang Technological University Singapore	University of Illinois at Urbana Champaign	2018
11	Interaction among aerosol components for altering the ROS activity of PM _{2.5}		University of Florida Gainesville, Engineering School of Sustainable Infrastructure and Environment, FL	2018
12	Oxidative properties of ambient		Illinois Sustainable Technology	2018

n	Title	Conference	Location	Year
	particulate matter - An assessment of the relative contributions from various aerosol components		Center, University of Illinois, IL	
13	Oxidative potential of ambient particulate matter in the Midwest US		Purdue University (Department of Chemistry), West Lafayette, IN	2018
14	Toxicity of ambient particulate matter		King's College, London, England	2019
15	Reactive oxygen species associated with ambient particulate matter		University of Birmingham, Birmingham, United Kingdom	2019
16	Novel instrumentations to measure the oxidative properties of ambient aerosols	Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON)	Chicago, IL	2020
17	Oxidative properties of the ambient PM2.5		Stanford University, Environmental Engineering & Science Program (Webinar)	2020
18	Health effects and epidemiological implications of PM2.5 properties		University of Illinois, Chicago (Webinar)	2020
19	Toxicological properties of ambient particles in the midwest US		University of Colorado Boulder (Webinar)	2020
20	Role of aerosol transmissions in the spread of Covid-19.	International Webinar on Science Behind Covid-19 and its Prevention, Uttarakhand, India	Pt. L. M. S. Government P. G. College, Sri Dev Suman Uttarakhand University Campus, Rishikesh, India (Webinar).	2020
21	Oxidative properties of ambient particulate matter - A new framework for assessing the toxicity and health effects of PM2.5	Global Sustainable Technology & Innovation Community (GSTIC) Conference.	Belgium (Webinar)	2020
22	Air pollution management through monitoring, modelling and health benefits assessment	Vaishvik Bhartiya Vaigyanik (Vaibhav) Summit	Indian Institute of Technology Delhi (Webinar)	2020
23	Oxidative properties of the ambient PM2.5		University of Toronto (Webinar)	2021
24	Measurement of the cellular oxidative potential and cytotoxicity of ambient PM2.5 an assessment of toxic PM2.5 chemical components and Their Sources in the Midwest US.	The Mid-Atlantic Regional Air Management Association meeting	Webinar	2021
25	Do all aerosol components exert same toxicity?	Air Quality and Chronic Disease Technical Working Group of Chicago Meeting	Northwestern University, Evanston, IL (Webinar)	2021
26	Vehicles, air pollution, and human health	Illinois Transportation and Highway Engineering (T.H.E.) Conference	University of Illinois at Urbana Champaign	2021
27	ROS-active organic and metallic components in the ambient PM2.5	Great Achievements in ES&T: James J. Morgan Environmental Science & Technology Early Career Award Symposium, ACS Spring meeting, 2021	Webinar	2021
28	Sources of cellular oxidative potential of water-soluble fine ambient particulate matter in the Midwestern United States	Illinois Climate Working Group Meeting, Illinois Environmental Protection Agency	Office of Energy, Illinois Environmental Protection Agency, Chicago (Webinar)	2022
29	Measuring health relevant properties of ambient atmospheric particles	Tutorial hosted by American Association of Aerosol Research	Raleigh, NC	2022
30	Novel methods to decontaminate face masks in the time of public health emergency	Keynote talk at the AEESP workshop on Mask Filtration and Decontamination	Saint Louis, MO	2022

h. Other Publications (*patents, bulletins or reports, magazine articles, etc.*)

1. Patents

1. (*) (W) Verma, V., Yu, H., Puthussery, J.V.P., Device and Method for Assessing Oxidative Potential of Ambient Particulate Matter, U.S. patent pending (17/204,158).

2. Bulletins

3. Magazine Articles

4. Reports

2. Grants, contracts and gifts (in chronological order up to past ten years)

a.i. Research Grants Received Since Last Promotion at Illinois.

a.ii. Other Research Grants Received at Illinois

n	#PI's and lead PI if not this prof	Source of Funds	Years (Inclusive)	Total Funding	Funds Allocated to this prof	Brief Title or Description
1	2 (lead: V. Verma)	BiRmtingham-Illinois partnership for Discovery, enGagement and Education	2018-2019	\$18,500 (status: funded)	\$10,000	Variability in the Oxidative Potential of Particulate Matter (PM) across Continents
2	1	National Science Foundation	2019-2023	\$501,438 (status: funded)	\$501,438	CAREER: A Comprehensive Assessment of the Reactive Oxygen Species Activity of Ambient Fine Particulate Matter and its association with the Chemical Composition: An Integrated Research and Education Plan
3	1	ZJU-UIUC Institute Research Program	2019-2020	\$75,000 (status: funded)	\$75,000	Toxicity Burden associated with Fine Ambient Particulate Matter (PM2.5) in Human Respiratory System
4	2 (lead: Andre Prevot)	Swiss National Science Foundation, Switzerland	2020-2021	\$500,000 (status: funded)	\$64,021	Which aerosol components and processes control the toxicity of ambient particulate pollution? Targeted studies of aerosol-induced oxidative stress
5	4 (lead: V. Verma)	Grainger College of Engineering Small Equipment Grants	2020	\$ 92,660 (status: funded)	\$ 92,660	Flow Cytometer to enhance the capabilities for environmental applications
6	1	National Science Foundation	2020-2023	\$ 330,000 (status: funded)	\$ 330,000	Evaluation of PM2.5 Oxidative Potential (OP) as a proxy for the aerosol toxicity
7	2 (lead: V. Verma)	The Jump Applied Research for Community Health through Engineering and Simulation (Jump ARCHES)	2020-2021	\$75,000 (status: funded)	\$60,000	Testing the Filtration Efficiency of N95 Respirators for Health-Care Employees and Protecting Public Health in Pandemic Flu Emergencies
8	3 (Thanh Huong Nguyen)	Novisphere, Inc.	2021	\$24,598 (status: funded)	\$7,000	Modeling of the Effect of a UV Device to Control SARS-CoV Transmission
9	1	UIUC Center for Advanced Study	2021	\$ 12,000 (status: funded)	\$ 12,000	Health-relevant Properties of Ambient Particulate Matter Targeted Studies in Air Polluted Cities across the World
10	3 (lead: V. Verma)	UIUC Institute for Sustainability, Energy, and Environment	2022	\$30,000 (status: funded)	\$20,000	Addressing Health Disparities Associated with Coal Tar Hazardous Waste through Interdisciplinary, Community-Engaged Research
11	5 (lead: Na Wei)	Strategic Research Initiatives, The Grainger College of Engineering, UIUC	2022-2023	\$75,000 (status: funded)	\$25,000	Intelligent Live Cell-Based Sensing System for Automated Real-time Monitoring of Airborne Pathogens for Safe Indoor Environments
12	6 (lead: Na Wei)	National Science Foundation	Date of submission: March 2022	\$2,000,000 (status: pending)	\$281,583	EFRI ELiS: Intelligent Live Cell-Based Sensing System for Automated Real-time Monitoring of Airborne Pathogens for Safe Indoor Environments
13	4 (lead: Thanh Huong)	National Science Foundation	Date of submission:	\$750,000 (status: pending)	\$107,183	Human-centered design of intervention to reduce pathogen exposure and emotional

n	#PI's and lead PI if not this prof	Source of Funds	Years (Inclusive)	Total Funding	Funds Allocated to this prof	Brief Title or Description
	Nguyen)		May 2022	pending)		distress among healthcare workers Submission Type: Full Proposal
14	4 (lead: V. Verma)	IBM-Illinois Discovery Accelerator Institute	Date of submission: May 2022	\$75,000 (status: pending)	\$25,000	An Innovative Framework to Quantify the Compound Heat-Oxidative Stress from Ambient PM2.5 based on satellite data, ground and laboratory measurements, and modeling

b.i. Instructional Grants Received Since Last Promotion at Illinois

b.ii. Other Instructional Grants Received at Illinois

3. Areas of Research (brief description, key words are adequate)

1. Role of aerosol composition and emission sources in the health effects
2. Development of online and automated instruments for measuring the ROS activity of ambient PM2.5
3. Development of novel endpoints for measuring the PM-induced ROS and toxicity
4. Modeling the spatiotemporal estimates of ROS activity using newer machine-learning techniques
5. Assessing inequality of air pollution risks across different population groups
6. Sampling and measurement of bioaerosols
7. Indoor air quality

4. Graduate Thesis Research Advising (list co-advisor, if any)

a. M.S. Thesis Students (name and year granted or anticipated)

n	Student Name	Year Graduated	Thesis Title	Placement
1	Qianshan Xiong	2017	Rethinking the dithiothreitol based PM oxidative potential: measuring antioxidant consumption versus ROS generation	Green Metro Planning LLC, Aurora, IL
2	Jinlai Wei	2018	Complexation of iron and copper in ambient particulate matter and its effect on the oxidative potential measured in a surrogate lung fluid	PhD student at University of California Irvine
3	Sankalp Kumar	2022 (expected)	Identification and quantification of asthma triggers faced by pediatric patients in indoor environments	

b. Ph.D. Thesis Students (name and year granted or anticipated)

n	Student Name	Year Graduated, if not yet graduated add expected date and prelim date if taken	Thesis Title	Placement
1	Haoran Yu	2022	Connecting acellular oxidative potential (OP) with chemical composition and emission sources of ambient fine particulate matter (PM2.5) in the midwestern US	Post-doctoral Fellow at University of California Davis
2	Yixiang Wang	2021	Measurement of the cellular oxidative potential and cytotoxicity of ambient PM2.5 an assessment of toxic PM2.5 chemical components and their sources in the midwest US	Post-doctoral Fellow at Southern University of Science and Technology, China
3	Joseph V. Puthussery	2021	Development of novel high-resolution instruments to measure the real-time oxidative potential of ambient particulate matter and their application in source apportionment	Post-doctoral Fellow at Washington University in St. Louis
4	Sudheer Salana	2024 (expected)	Evaluation of PM2.5 Oxidative Potential (OP) as a proxy for the aerosol toxicity	
5	Ganesh Subramanian Pavizhakattumadom Saptharishi	2025 (expected)	Assessing the influence of human-related activities on generation of indoor aerosols and their potential contribution to infectious and chronic	

n	Student Name	Year Graduated, if not yet graduated add expected date and prelim date if taken	Thesis Title	Placement
			diseases	
6	Tahsina Alam (joining Fall 2022)	2027 (expected)	Machine learning methods for predicting the spatiotemporal profiles of ambient PM2.5 oxidative potential	

5. Editorships of Journals or Other Learned Publications (*list year*)

1. Guest Editor for Special Issue (Oxidative Properties and ROS Activity of Ambient Particulate Matter) of the journal - Atmosphere, 2020
2. Guest editor for Special Issue (Free radical chemistry and toxicology) of the journal - Ecotoxicology and Environmental Safety, 2021
3. Editor for Virtual Collections on the theme of Toxicology (Toxicity of ambient particulate matter - Impact of chemical composition, emission sources and atmospheric processes) for the journal Aerosol Science and Technology, 2022.

6. Post-doctoral Associates and Visiting Scientists (>3 months stay in the past three years) (*list name, year(s), country of origin, permanent employer*)

n	Name	Title (percent time)	Country of Origin	Permanent Employer	Years
1	Jing Xu	Visiting Scientist	China	China University of Petroleum	2018-2019
2	Lianming Zhao	Visiting Scientist	China	China University of Petroleum	2018-2019

7. Other Scholarly Activities in the past five years (*conferences organized or chaired, unpublished presentations, etc.*)

a. Conferences Organized or Chaired

1. Chaired four sessions of special symposium on "Linking aerosols with public Health in a changing world", American Association of Aerosol Research Conference (AAAR), 2014, Orlando, FL.
2. Chaired one session on "health related aerosols" working group, American Association of Aerosol Research Conference (AAAR), 2015, Minneapolis, MN.
3. Organized a special symposium on "Linking the aerosol oxidative potential with chemical composition and biological endpoints", American Association of Aerosol Research Conference (AAAR), 2017, Raleigh, NC.
4. Organized a special symposium on "Aerosol and health-connecting the dots", International Aerosol Conference, 2018, St. Louis, MO.
5. Chaired a special session on "Airborne Particulate Matter: Linking sources and composition to specific health effects", American Geophysical Union (AGU) Fall Meeting, 2018, Washington DC
6. Organized and chaired a special GeoHealth session on "Health effects of atmospheric fine dust and gases", American Geophysical Union Fall meeting, 2019, San Francisco, CA
7. Chaired a session on the oxidative potential of ambient PM2.5 in the American Association for Aerosol Research Conference (AAAR), 2020 (Online)
8. Organized and chaired a special session on "Air pollution management through monitoring, modelling and health benefit assessment" in the Vaishvik Bhartiya Vaigyanik (Vaibhav) Summit, 2020, India (Online).
9. Chaired a session on Health-related Aerosols in the American Association for Aerosol Research Conference (AAAR), 2021 (online)
10. Organized and chaired a special GeoHealth session on "Tools and technologies to measure the health-relevant properties of atmospheric air pollutants " in American Geophysical Union (AGU) Fall meeting, 2021, New Orleans, LA

b. Unpublished Presentations

1. Verma, V., Polidori, A., Schauer, J.J., Shafer, M.M., Cassee, F.R., Sioutas, C. Physicochemical and toxicological profiles of particulate matter in Los Angeles during the October 2007 southern California wildfires. American Association of Aerosol Research Conference (AAAR), Orlando, Florida, October 20 - 24, 2008.
2. Verma, V., Moore, K.F., Minguillon, M.C., Sioutas, C. Inter- and intra-community variability in continuous coarse particulate matter (PM10-2.5) concentrations in the Los Angeles area. American Association of Aerosol Research Conference (AAAR), Minneapolis, MN, October 26 - 30, 2009.
3. Verma, V., Pakbin, P., Cheung K.C., Sioutas, C. Physicochemical and toxicological characteristics of semi-volatile particulate matter in an urban environment. American Association of Aerosol Research Conference (AAAR), Minneapolis, MN, October 26 - 30, 2009.
4. Verma, V., Ning, Z., Cho, A.K., Schauer, J.J., Shafer, M.M., Sioutas, C. Redox activity of urban quasi-ultrafine particles from primary and secondary sources. American Association of Aerosol Research Conference (AAAR), Minneapolis, MN, October 26 - 30, 2009.
5. Verma, V., Moore, K.F., Minguillon, M.C., Sioutas, C. Spatial variability in continuous coarse particulate matter (PM10-2.5) concentrations in the Los Angeles area, Air Pollution and Health: Bridging the Gap from Sources to Health Outcomes (AAAR and AWMA specialty conference), San Diego, CA, March 22-26, 2010.

6. Verma, V., Ning, Z., Cho, A.K., Schauer, J.J., Shafer, M.M., Sioutas, C. Diurnal variation in Toxicity of urban quasi-ultrafine particles from primary and secondary sources, Air Pollution and Health: Bridging the Gap from Sources to Health Outcomes (AAAR and AWMA specialty conference), San Diego, CA, March 22-26, 2010.
7. Verma, V., Pakbin, P., Cheung, K.L., Cho, A.K., Schauer, J.J., Shafer, M.M., Kleinman, M.T., Sioutas, C. Oxidative characteristics of semi-volatile components of quasi-ultrafine particles in an urban atmosphere. American Association of Aerosol Research Conference (AAAR), Portland, OR, October 25-29, 2010.
8. Verma, V., Shafer, M.M., Schauer, J.J., Sioutas, C. Contribution of transition metals in the reactive oxygen species activity of PM emissions from retrofitted heavy-duty vehicles, American Association of Aerosol Research Conference (AAAR), Portland, OR, October 25-29, 2010.
9. Verma, V., Pakbin, P., Cheung, K.L., Cho, A.K., Schauer, J.J., Shafer, M.M., Kleinman, M.T., Sioutas, C. Toxicity of semi-volatile components of quasi-ultrafine particles in an urban atmosphere, American Geophysical Union (AGU) Fall Meeting, San Francisco, CA, December 13-17, 2010.
10. Verma, V., Kotra, N., King, L., Weber, J. Oxidative properties of ambient aerosols – PM associated ROS generation, Clean Air Research Centers Annual Meeting, hosted by the Harvard Clean Air Research Center, Boston, June 21 and 22, 2012.
11. Verma, V., Rico-Martinez, R., Kotra, N., King, L., Liu, J., Snell, T., Weber, J., Russell, A. Contribution of water-soluble and insoluble species and their hydrophobic/hydrophilic sub-fractions in the ROS generating potential of ambient atmospheric aerosols. International Global Atmospheric Chemistry (IGAC) Open Science Conference, Beijing, China, September 17-21, 2012.
12. Verma, V., Ng, N.L., Kotra, N., King, L., Liu, J., Guo, H., Edgerton, E., Weber, R.J. Performance evaluation of a Recently Developed Aerosol Chemical Speciation Monitor (ACSM). American Association of Aerosol Research Conference (AAAR), Minneapolis, MN, October 08 – 12, 2012.
13. Verma, V., Rico-Martinez, R., Kotra, N., King, L., Liu, J., Snell, T., Weber, J. Contribution of HULIS in the ROS generating potential of ambient atmospheric aerosols. American Association of Aerosol Research Conference (AAAR), Minneapolis, MN, October 08 – 12, 2012.
14. Verma, V., Fang, T., Weber, R.J. Spatial and temporal assessment of the oxidative properties of ambient aerosols in southeastern US, Clean Air Research Centers Annual Meeting, Seattle, July 25-26, 2013.
15. Verma, V., Fang, T., Weber, R.J. Tracing the spatial and seasonal trends in the oxidative activity of ambient PM in southeast US, American Association of Aerosol Research Conference (AAAR), Portland, OR, September 30 – October 4, 2013.
16. Verma, V., Fang, T., Wang, Y., Ng, N., Weber, R.J. Seasonal and spatial profiles of the oxidative properties of ambient particles in southeast US, Science Advisory Committee meeting of Southeastern Center for Air Pollution and Epidemiology, Atlanta, GA, November 14, 2013.
17. Verma, V., Fang, T., Guo, H., King, L., Edgerton, E., Peltier, R., Russell, A.J., Weber, R.J. Sources of reactive oxygen species (ROS) generation properties of atmospheric aerosols in southeastern United States., American Association of Aerosol Research Conference (AAAR), Orlando, FL, October 20 – October 24, 2014.
18. Verma, V., Wang, Y., Afifi, R., Fang, T., Rowland, J., Russell, A., Weber, R.J. On the contribution of atmospheric quinones to reactive oxygen species associated with water-soluble PM_{2.5}, American Association of Aerosol Research Conference (AAAR), Orlando, FL, October 20 – October 24, 2014.
19. Verma, V., Fang, T., Nga, N.L., Lu, X., Russell, A.J., Weber, R.J. Application of aerosol mass spectrometry to infer the sources of the reactive oxygen species generating properties of organic aerosols in the southeastern United States. American Association of Aerosol Research Conference (AAAR), Orlando, FL, October 20 – October 24, 2014.
20. Verma, V., Fang, T., Nga, N.L., Lu, X., Russell, A.J., Weber, R.J. Biomass burning as an important source of reactive oxygen species associated with the atmospheric aerosols in southeastern United States – Implications for health effects of ambient particulate matter, American Geophysical Union (AGU) Fall Meeting, San Francisco, CA, December 15-19, 2014.
21. Verma, V., Fang, T., Bates, J.T., Abrams, J., Klein, M., Strickland, M.J., Sarnat, S.E., Chang, H., Mulholland, J., Tolbert, P., Russell, A.G., Devlin, R., Weber, R.J. Air pollution and health. American Association of Aerosol Research Conference (AAAR), Minneapolis, MN, October 12-16, 2015.
22. Verma, V., Fang, T., Bates, J.T., Abrams, J., Klein, M., Strickland, M.J., Sarnat, S.E., Chang, H., Mulholland, J., Tolbert, P., Russell, A.G., Devlin, R., Weber, R.J. Reactive oxygen species (ROS) associated with the ambient particulate matter, International Society of Exposure Sciences, Henderson, Nevada, October 18-22, 2015.
23. Verma, V., Xiong, Q., Yu, H., and Wang, R. Rethinking the dithiothreitol based PM oxidative potential: measuring antioxidant consumption versus ROS generation. American Association of Aerosol Research Conference (AAAR), Portland, OR, October 17-21, 2016.
24. Yu, H., Zhao, H., Stephens, B., Verma, V. Comparison of reactive oxygen species (ROS) generation ability of size-segregated aerosols of ambient origin in indoor and outdoor environments. American Association of Aerosol Research Conference (AAAR), Raleigh, NC, October 16 – 20, 2017.
25. Fang, T., Zeng, L., Gao, D., Guo, H., Verma, V., Stefaniak, A., Nenes, A., Weber, R.J. Ambient size distributions and lung deposition of aerosol dithiothreitol-measured oxidative potential: a contrast between soluble and insoluble particles, American Association of Aerosol Research Conference (AAAR), Raleigh, NC, October 16 – 20, 2017.
26. Atwi, K., Shihadeh, A., Sioutas, C., Shirmohammadi, F., Verma, V., Schauer, J. A comparison of oxidative potential of POA and SOA derived from –pinene and gasoline engine exhaust precursors. American Association of Aerosol Research Conference (AAAR), Raleigh, NC, October 16 – 20, 2017.
27. Yu, H., Wei, J., Verma, V. Synergistic and antagonistic interactions among the particulate matter (PM) components in generating the reactive oxygen species (ROS). American Association of Aerosol Research Conference (AAAR), Raleigh, NC, October 16 – 20, 2017.
28. Bates, J., Weber, R.J., Abrams, J., Verma, V., Fang, T., Ivey, C., Klein, M., Strickland, M., Sarnat, S.E., Chang, H., Mulholland, J., Tolbert, P., Russell, A.G. Impacts of emission sources on spatiotemporal variability in aerosol oxidative potential. American Association of Aerosol Research Conference (AAAR), Raleigh, NC, October 16 – 20, 2017.

29. Shirmohammadi, F., Lovett, C., Sowlat, M., Hasheminassab, S., Saffari, A., Ban-Weiss, G., Verma, V., Shafer, M., Schauer, J., Sioutas, C. Comparison of aircraft emissions near Los Angeles international airport (LAX) to urban vehicle traffic emissions and its impact on air quality in Los Angeles. American Association of Aerosol Research Conference (AAAR), Raleigh, NC, October 16 - 20, 2017.
30. Puthussery, J.V., Verma, V. Developing an online system for measuring the oxidative potential of ambient particles based on dithiothreitol (DTT) assay. American Association of Aerosol Research Conference (AAAR), Raleigh, NC, October 16 - 20, 2017.
31. Wang, Y., Plewa, M., Verma, V. Relationship between reactive oxygen species (ROS) activity and cytotoxicity of ambient particles. American Association of Aerosol Research Conference (AAAR), Raleigh, NC, October 16 - 20, 2017.
32. Wei, J., Verma, V. Complexation state of metals in ambient particulate matter (PM) and its effect on the oxidative potential. American Association of Aerosol Research Conference (AAAR), Raleigh, NC, October 16 - 20, 2017.
33. Verma, V., Yu, H., Zhao, H., Stephen, B. Comparison of the oxidative potential of size-segregated aerosols of ambient origin in indoor and outdoor environments, Indoor Air Conference, Philadelphia, PA, July, 22-27, 2018.
34. Puthussery, J.V., Zhang, C., Verma, V., Measuring the real-time oxidative potential of ambient particulate matter using an online mist chamber system, International Aerosol Conference, St. Louis, MO, September 2-7, 2018.
35. Yu, H., Puthussery, J.V., Verma, V. A semi-automated system for measuring the reactive oxygen species (ROS) catalyzed by ambient particulate matter (PM) in a dithiothreitol (DTT) assay, International Aerosol Conference, St. Louis, MO, September 2-7, 2018.
36. Molina, C., Verma, V., Vargas, V. Manuel, A., L.G., Oxidative potential of ambient aerosols: first measurement over Santiago metropolitan area, International Aerosol Conference, St. Louis, MO, September 2-7, 2018.
37. Wang, Y., Plewa, M., Verma, V. Non-additive effects of the mixture of metals and organic compounds to mammalian cell cytotoxicity of particulate matter (PM), International Aerosol Conference, St. Louis, MO, September 2-7, 2018.
38. Verma, V., Wei, J., Yu, H. Complexation of iron and copper in ambient particulate matter and its effect on the oxidative potential measured in a surrogate lung fluid, AGU fall meeting, Washington DC, December 10-14, 2018.
39. Zhang, W., Yu, H., Hettiyadura, A., Verma, V., Laskin, A. Synergistic effect of quinoline constituents oxidative potential of ambient humic-like substances (HULIS), Turkey Run Analytical Chemistry Conference, Turkey Run State Park, Marshall, IN, September 27-28, 2019.
40. Yu, H., Puthussery, J.V., Wang, Y., Verma, V. A Comprehensive assessment of the spatiotemporal variability of oxidative potential of ambient PM_{2.5} in midwest U.S. using a Semi-Automated Multi-Endpoint ROS-Activity Analyzer (SAMERA). American Association of Aerosol Research Conference (AAAR), Portland, OR, October 14 - 18, 2019.
41. Wang, Y., Puthussery, J.V., Yu, J., Verma, V. Synergistic and antagonistic interactions among the particulate matter (PM) components for cellular ROS activity and cytotoxicity. American Association of Aerosol Research Conference (AAAR), Portland, OR, October 14 - 18, 2019.
42. Puthussery, J.V., Yu, H., Wang, Y., Cornejo, I., Verma, V. Real-time measurement of ambient particulate matter oxidative potential based on five different acellular endpoints, AGU Fall Meeting, San Francisco, CA, December 9-13, 2019.
43. Yu, H., Puthussery, J.V., Wang, Y., Verma, V. Spatiotemporal variability in the reactive oxygen species in the midwest U.S., AGU Fall Meeting, San Francisco, CA, December 9-13, 2019.
44. Salana, S., Verma, V. Development of a semi-automated instrument to measure the cellular reactive oxygen species (ROS) activity of ambient particulate matter. American Association of Aerosol Research Conference (AAAR) (online), October 5 - 9, 2020.
45. Puthussery, J.V., Shukla, A., Dave, J., Gaddamidi, S., Singh, A., Ganguly, D., Rastogi, N., Tripathi, S.N., Verma, V. Effect of biomass burning, firework emissions, and haze events on the oxidative potential of ambient particulate matter in Delhi, India, American Association of Aerosol Research Conference (AAAR) (online), October 5 - 9, 2020.
46. Yu, H., Puthussery, J.V., Wang, Y., Liu, Y., Verma, V. Spatiotemporal variability and source apportionment of oxidative potential associated with water-soluble PM_{2.5} in the midwest United States. American Association of Aerosol Research Conference (AAAR) (online), October 5 - 9, 2020.
47. Wang, Y., Yu, H., Puthussery, J.V., Salana, S., Verma, V. Spatiotemporal distribution and source apportionment of macrophage reactive oxygen species activity of ambient fine particulate matter (PM_{2.5}) in the midwestern United States. American Association of Aerosol Research Conference (AAAR) (online), October 5 - 9, 2020.
48. Yu, H., Wang, Y., Puthussery, J.V., Verma, V. Emission sources contributing to mass concentration and oxidative potential (OP) of ambient fine particulate matter in the midwestern United States, American Chemical Society (ACS) Fall meeting, Atlanta, GA, August 22-26, 2021.
49. Wang, Y., Yu, H., Puthussery, J.V., Verma, V. On the relative contribution of Fe and organic compounds, and their interaction in cellular oxidative potential (OP) of ambient PM_{2.5}. European Aerosol Conference (online), August 30 - September 3, 2021.
50. Puthussery, J.V., Shukla, A., Dave, J., Gaddamidi, S., Singh, A., Ganguly, D., Rastogi, N., Tripathi, S.N., Verma, V. Seasonal trends and influence of episodic events on the oxidative potential of ambient particulate matter in Delhi, India, European Aerosol Conference (online), August 30 - September 3, 2021.
51. Cheung, K.Y., Qi, L., Puthussery, J.V., Ge, Y., Wei, G., Kuang, Y., Sheng, M., Cheng, Z., Li, A., Shang, J., Chen, Q., Qiu, X., Verma, V., Gysel-Beer, M., Haddad, I. E., Prevot, A., Modini, R.L. Online measurement of the oxidative potential of PM_{2.5} using a dithiothreitol assay in Beijing, China – the interplay between reactive oxygen species formation and metal solubility, European Aerosol Conference (online), August 30 - September 3, 2021.
52. Yu, H., Puthussery, J.V., Verma, V. Spatiotemporal variability in the oxidative potential of ambient fine particulate matter in midwestern United States. American Association of Aerosol Research Conference (AAAR) (online), October 18 - 22, 2021.
53. Wang, Y., Yu, H., Puthussery, J.V., Verma, V. Relative importance of Fe and organic compounds, and their interaction in cellular oxidative potential (OP) of ambient PM_{2.5}. American Association of Aerosol Research Conference (AAAR) (online), October 18 - 22, 2021.
54. Puthussery, J.V., Yu, H., Wang, Y., Cornejo, I., Verma, V. Real-time measurement and source apportionment of five different endpoints of the oxidative potential of ambient particulate matter at an urban site. American Association of Aerosol Research Conference (AAAR) (online), October 18 - 22, 2021.

55. Salana, S., Wang, Y., Puthussery, J.V., Yu, H., Verma, V. Development of a semi-automated instrument to measure the cellular reactive oxygen species (ROS) activity of ambient particulate matter. American Association of Aerosol Research Conference (AAAR) (online), October 18 - 22, 2021.
56. Salana, S., Wang, Y., Verma, V. Assessing cellular responses to ambient PM_{2.5} in the midwest USA using a semi-automated instrument for cellular oxidative potential (SCOPE) and flow cytometric analysis, AGU Fall meeting, New Orleans, LA, December 13-17, 2021.
57. Puthussery, J.V., Shukla, A., Dave, J., Gaddamidi, S., Singh, A., Ganguly, D., Rastogi, N., Tripathi, S.N., Verma, V. Influence of extreme air pollution episodes on the oxidative potential of ambient particulate matter in Delhi, India, AGU Fall meeting, New Orleans, LA, December 13-17, 2021.
58. Yu, H., Wang, Y., Puthussery, J., Verma, V. Sources of the oxidative potential (OP) of ambient fine particulate matter in the midwestern United States, AGU Fall meeting, New Orleans, LA, December 13-17, 2021.
59. Verma, V., Yu, H., Puthussery, J.V., Salana, S. Novel instrumentations to measure the oxidative potential of ambient particulate matter, ACS Spring Meeting (Online), March 20-24, 2022.
60. Salana, S., Yu, H., Puthussery, J.V., Wang, Y., Verma, V. PM_{2.5}-induced cytotoxicity: role of ROS and glutathione depletion. The International Aerosol Conference (IAC), Athens, Greece, September 4-9 2022.
61. Cheung, K.Y., Qi, L., Puthussery, J.V., Ge, Y., Wei, G., Kuang, Y., Sheng, M., Cheng, Z., Li, A., Shang, J., Chen, Q., Qiu, X., Verma, V., Gysel-Beer, M., Haddad, I. E., Prevot, A., Modini, R.L. Online dithiothreitol-based measurement of PM_{2.5} oxidative potential from two distinct pollution events in Beijing, China, The International Aerosol Conference (IAC), Athens, Greece, September 4-9 2022.
62. Subramanian, G.P.S., Puthussery, J.V., Mao, Y., Nguyen, T.H., Newell, T., Verma, V. Influence of human activities and occupancy on emissions of indoor particles and their potential contribution to fomites. American Association of Aerosol Research Conference (AAAR), Raleigh, NC, October 3-7, 2022.
63. Salana, S., Yu, H., Puthussery, J.V., Wang, Y., Verma, V. Evaluation of PM_{2.5}-induced antioxidant consumption and ROS generation as a proxy for the aerosol toxicity. American Association of Aerosol Research Conference (AAAR), Raleigh, NC, October 3-7, 2022.

c. Other Scholarly Activities

C. Service

1. Professional Societies (*list membership; office held, with dates; major committees or boards*)

1. American Association of Aerosol Research: a) Member (2007-present); b) Vice chair of health related aerosol working group (2016-2017); c) Chair of health related aerosol working group (2017-2018)
2. American Geophysical Union (AGU) (member, 2009-present)
3. International Society of Exposure Sciences (member, 2015-present)
4. Association of Environmental Engineering and Science Professors (member, 2015-present)
5. American Chemical Society (member, 2017-present)

2. University (*department, college and campus committees, administration, etc. for past five years*)

a. Department

1. Conducted CEE 195: About Civil Engineering seminars (Fall 2016, Fall 2017 and Fall 2018)
2. Coordinated graduate recruitment weekend presentations in Environmental Engineering and Science Program (Spring 2016, Spring 2017 and Spring 2018)
3. Chair of the admission committee for Environmental Engineering and Science Program (AY: 2017-2018, 2018-2019 and 2019-2020)
4. Member of Civil and Environmental Engineering (CEE) faculty search committee, UIUC, 2018-2019.
5. Director of Environmental Engineering and Science Research Laboratories (2020-present)
6. Member of the program committee to prepare and submit the proposal for the Bachelor of Science in Environmental Engineering in Department of Civil and Environmental Engineering, 2021

b. College

1. Reviewer - Strategic Research Initiative (SRI - Phase 1) applications - Spring 2019

c. Campus

1. Member of the UIUC emergency response team to develop personal protective equipment (PPE) for the healthcare workers in Urbana Champaign community during COVID -19.
2. Member of the search committee for the position of a research scientist in the Department of Atmospheric Sciences, UIUC, 2022.

3. Federal and State (*government commissions or panels, community, industrial extension, etc.*)

1. Served on NSF (Environmental Engineering Division) proposal review panel, Arlington, VA (member, March 2016)
2. Served on NSF (Environmental Engineering Division) CAREER proposal review panel, Arlington, VA (member, September 2019)
3. Served on NSF (Environmental Engineering Division) CAREER proposal review panel, held online (member, October 2020)

4. Served on NSF (Small Business Innovation Research/Small Business Technology Transfer SBIR/STTR Programs) proposal review panel, held online (member, March 2021)

4. Other Outside Service

1. Reviewer for the following journals: Environmental Science and Technology, Atmospheric Chemistry and Physics, Atmospheric Measurement Techniques, Scientific Reports (Nature), Environmental Pollution, GeoHealth, Science of Total Environment, Journal of Hazardous Materials, Environment International, Environmental Research, Aerosol Science and Technology, Journal of Air and Waste Management Association, Atmospheric Environment, Environmental Toxicology, Journal of Environmental Science and Health.
2. Guest Editor for Special Issue (Oxidative Properties and ROS Activity of Ambient Particulate Matter) of the journal - Atmosphere, 2020
3. Reviewer for the abstracts submitted to Indoor Air conference 2018.
4. Reviewer for the abstracts submitted to European Aerosol Conference 2021.
5. Guest editor for Special Issue (Free radical chemistry and toxicology) of the journal - Ecotoxicology and Environmental Safety, 2021
6. Reviewer for the proposals submitted to Swiss National Science Foundation (SNSF) 2020, 2021
7. Editor for Virtual Collections on the theme of Toxicology (Toxicity of ambient particulate matter - Impact of chemical composition, emission sources and atmospheric processes) for the journal Aerosol Science and Technology, 2022.

D. Improvement Activities (list any specific programs in which you have participated to improve teaching and professional competence)

1. Participated and awarded as Collins Scholar in the College of Engineering Academy for Excellence in Engineering Education program, 2015-16.
2. Participated in NSF CAREER Workshop - Mock review panel at UIUC, April 28, 2016
3. Participated in Pre-Tenure Workshop at UIUC, May 05, 2016

E. Professional Highlights

1. Got interviewed by Illinois Public Media for our study on assessing the air pollution in rural areas. The interview was aired on National Public Radio (NPR) in February 2022. https://will.illinois.edu/nfs/217_Today_1-31-22.mp3

F. Biography, Statements and Updates

Vishal Verma is an Assistant Professor of Environmental Engineering in the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign with research and education focus on assessing the health impacts of ambient PM_{2.5}. Dr. Verma obtained his Ph.D. from the University of Southern California (2011). Before joining UIUC, he worked as a research scientist at the Georgia Institute of Technology (2011-2015). In his 15 years of research career, he has published 45 peer-reviewed articles in highly ranked journals (12 in ES&T and ES&T letters) and has presented his work in numerous seminars/meetings and conferences, including 30 invited talks. Dr. Verma is past chair of the Health Related Aerosol working group at AAAR and has earned numerous awards and recognitions for his work including the NSF CAREER award (2019), Honorable Mention for the James J. Morgan Early Career Award from Environmental Science and Technology journal, UIUC Center for Advanced Study Fellow (2021-22), and invited chair for special symposiums/sessions on Air Pollution and Health in the annual AAAR and AGU conferences.

Dr. Verma's teaching strategy is anchored on motivating his students and developing in them a scientific curiosity towards various facets of the nature surrounding us. He has implemented this teaching strategy in all the courses that he has taught so far, i.e. CEE 545: Aerosol Sampling and Analysis, CEE 435: Public Health Engineering, and CEE 449: Environmental Engineering Lab (CEE 449 in collaboration with his colleague Professor Roland Cusick). He strongly believes that students graduating from our CEE department should be able to handle complex open-ended problems related to public health, using the engineering principles learned during their undergraduate/graduate programs. Therefore, he works very hard to bring this aspect to all the courses that he has taught here, by developing new modules in the existing courses and also developing new courses. One of his most significant contributions to teaching has been the development of CEE 435 (initially CEE 498 PHE), which he first created in Fall 2016. This course is aimed at building a next generation of engineers who are able to incorporate the principles of public health in all engineering designs. The course covers a wide variety of topics, including epidemiology, toxicology, infectious and chronic diseases, and risk assessment. With his unique contribution in this area, CEE graduates are equipped with both fundamental understanding and the practical skills needed to address complex problems of public health, such as COVID-19. Dr. Verma is committed to lead the development of this new interface between environmental and public health engineering that he seeded at UIUC, and shaping the concentration area on public health in the newly proposed B.S. in Environmental Engineering at UIUC.

Air pollution is amongst the leading risk factors for premature deaths worldwide, and fine ambient particulate matter (PM below 2.5 μm in size or PM_{2.5}) is most hazardous component of air pollutants. The main focus of Dr. Verma's research is to identify the components of ambient PM_{2.5} and their emission sources, which are responsible for inducing adverse health effects in humans. It includes the quantification of their relative contributions, elucidating their unique mechanisms of action, and replicating those mechanisms in laboratory to gain a better understanding of the impact of various PM_{2.5} emission sources and atmospheric processes on human health. The national ambient air quality standards in both developed and developing nations are currently based on mass concentration of the particles. Dr. Verma has shown that this mass-centered approach is flawed because there is substantial heterogeneity in the toxicities of ambient PM_{2.5} coming from different emission sources. One prominent hypothesis of his research is that health impacts are driven by the generation of reactive oxygen species (ROS), a property of ambient PM_{2.5} known as oxidative potential or ROS activity. Three major thrusts in the pursuit of his research goals are: 1) investigating the role of aerosol composition in the ROS activity and PM_{2.5} toxicity; 2) creating elegant online and automated instruments for

measuring the ROS activity of ambient PM_{2.5}; and 3) developing novel chemical and cellular endpoints for measuring the PM-induced ROS and toxicity. Dr. Verma emphasizes that the integrated approach of incorporating PM_{2.5} chemical composition and its oxidative properties in toxicological studies as adopted in his research themes is the key for designing effective strategies for controlling relevant PM_{2.5} sources and combating human exposure to toxic PM_{2.5} species.

G. Diversity, Equity, Inclusion, or Access

List any specific activities participated that promote or contribute to improving Diversity, Equity, Inclusion, Access, Climate, or Culture through your research, teaching, service, outreach, or public engagement..

- (@) Department Activity
- (%) College Activity
- (^) Campus Activity
- (=) UI System Activity
- (!) Represents most important activity
- (@@) External Local Activity
- (@%) State Activity
- (^^) Federal Activity
- (==) Professional Society Activity

1. INDIVIDUAL impacts

1. Collaborating with Illinois Scholars Undergraduate Research (ISUR) program at UIUC to enhance the participation of undergraduates from underrepresented communities in research.
2. Mentoring and supervising the research of 2 undergraduate students through ISUR programs and motivated them to work in the field of air pollution
3. Partnering with Champaign County Health Care Consumers (CCHCC) - a local nonprofit organization working for health care justice
4. Supporting the residents of the 5th & Hill neighborhood in Champaign, Illinois, who are affected by the presence of residual wastes from a former manufactured gas plant.
5. Working with Spotlight Air Environmental - a community air quality watchdog group in the Champaign-Urbana area, supporting their air monitoring activities and empowering the public with the results and data interpretation and impact tools.

a. Undergraduate

b. Graduate

c. Postdoctoral or Professional Scholar

2. PROGRAMMATIC impacts

1. Leading a project focused on addressing the health disparities associated with coal tar hazardous waste in a local community (made up of mostly people of color) of Champaign-Urbana, i.e. 5th and Hill Street.

3. INSTITUTIONAL impacts

1. Integrated our community-engaged research on 5th and Hill street, into an undergraduate Civil and Environmental Engineering laboratory course (CEE 449: Environmental Engineering Lab) taught in Spring 2022.

4. CLIMATE and CULTURE impacts

5. TRAINING

1. Presented a seminar on inequity in air pollution and the air quality in rural American areas, in the Illinois Climate Working Group Meeting, Illinois Environmental Protection Agency, March 2022.

6. DIVERSITY STATEMENT

1. The ultimate mission of my research, teaching and service work strongly embeds the principle of "Environmental Justice", which emphasizes that all people, irrespective of their race, color or ethnicity should be equally protected from environmental pollution and have the right to a clean and healthy environment. Recent studies have shown a disproportionate impact by air pollution - those facing the greatest burden are communities of color and low-income regions. In fact, the 2020 State of the Air report found that people of color are 1.5 times more likely to live in areas with poor air quality compared to people identifying as white. My pioneering research in public health engineering at the University of Illinois Urbana-Champaign includes an active component in bringing diversity, equity and inclusion (DEI) in areas affected by poor air pollution. In particular, through my NSF grants, I am collaborating with the Illinois Scholars Undergraduate Research (ISUR) program at Illinois to enhance the participation of undergraduates from underrepresented communities in research. These students are involved in the development of our air sampling instruments and conducting field

sampling. My recently funded project from the Institute for Sustainability, Energy, and Environment at UIUC (iSEE) focusing on addressing the health disparities associated with coal tar hazardous waste in a local community of Champaign-Urbana, i.e. 5th and Hill Street, is a perfect example of our efforts toward achieving environmental justice. The community in this area consists mostly of people of color, and experiences higher than expected rates of oncological, neurological, and endocrine health problems. My project is integrating social justice with the Land Grant mission of the University of Illinois by developing a network of academic researchers and social justice organizers to help empower the communities of color in creating structural change to address health disparities rooted in systemic racism. My efforts center on the communities collocated with former manufactured gas plants (MGPs) and impacted by MGP waste. This project leverages my existing relationships with the local non-profit Champaign County Health Care Consumers (CCHCC) and residents of the 5th & Hill neighborhood in Champaign, Illinois, who are affected by the presence of legacy residues of MGP coal tar. I am taking a community-based participatory research approach, which consists of involving the affected community in all stages of the research process, from design to implementation, and disseminating environmental data and risk assessment findings. I am also integrating our community-engaged research and Diversity, Equity and Inclusion efforts into an undergraduate Civil and Environmental Engineering laboratory course (CEE 449: Environmental Engineering Lab), which I have redeveloped and taught with my colleague Professor Roland Cusick, an expert in water quality, in Spring 2022. Our objective is to embed the principles of anti-racism and equity into environmental engineering practice. We have developed and included a module on environmental racism in the course content. The students developed low-cost sampling devices to sample multi-media (water, air and soil) and implemented their class design projects in the affected areas of 5th and Hill Street. Some examples of these projects are: indoor vs. outdoor air pollution modeling in the affected communities of 5th and Hill street neighborhood, comparing water quality at different green infrastructure installations along Boneyard Creek on the university campus, and monitoring water-pollutant levels at previously unregulated discharge sites, which were used to dump coal tar and other petroleum-based wastes. The sampling conducted under these projects will serve as the benchmark for initiating community-driven sampling of environmental quality, and lead towards developing a crowdsourced data-network of the ambient environmental monitoring by local communities. Our commitment to provide expertise and analytical support for local environmental justice advocacy and promote long-term health benefit to the local community will establish a blueprint for successful community-academic partnerships to address environmental racism. Overall, through my integrated research, teaching and service efforts, I am committed to continue my work to reduce the disparities of the environmental burden among different communities and ensure the inclusion of disadvantaged communities to promote health, prosperity, and equity.