

Dr. Arindam Malakar, Ph.D.

Curriculum Vitae

The University of Nebraska-Lincoln
Nebraska Water Center, Daugherty Water for Food Global Institute
School of Natural Resources
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PROFESSIONAL EXPERIENCE

- 2021 – Present **Water Research Scientist**
University of Nebraska-Lincoln, Nebraska, USA
(Lab webpage: www.malakarczrgroup.org)
- 2017 – 2021 **Postdoctoral Research Associate**
Water Sciences Laboratory, Nebraska Water Center, University of Nebraska-Lincoln, USA. Supervisors: Dr. Chittaranjan Ray and Dr. Daniel D. Snow
Co-supervised two graduate students (Major: Natural Resource Sciences) and supervised four undergraduate students.
- 2017 – 2017 **Research Associate – I**
Indian Association for the Cultivation of Science, India
Co-supervised one graduate student.
- 2016 – 2016 **Water Advanced Research and Innovation Internship**
University of Nebraska-Lincoln, USA. Supervisors: Dr. Yusong Li and Dr. Daniel D. Snow
- 2012 – 2016 **Senior Research Fellow**
Indian Association for the Cultivation of Science, India.
Supervisor: Dr. Sugata Ray
- 2010 – 2012 **Junior Research Fellow**
Indian Association for the Cultivation of Science, India.
Supervisor: Dr. Sugata Ray

EDUCATION

- 2017 – 2021 **Postdoctoral Research** (Environmental Chemistry)
Nebraska Water Center, University of Nebraska-Lincoln, USA
- 2017 **Ph.D.** (Chemistry)

Indian Association for the Cultivation of Science and Department of Chemistry, University of Calcutta, India.

University of Nebraska-Lincoln, Lincoln, Nebraska, USA.

University of Cagliari, Cagliari, Italy.

Thesis: *Using Nanotechnology and Membrane Engineering for Effective Desalination of Water*

2010

M.S. (Chemistry (Distinction))

Department of Chemistry, Banaras Hindu University, Varanasi, India. Minor in Resources and Environmental Management.

Thesis: *3D Polymers Synthesis Based on Carboxylate Ligands*

2008

B.S. (Chemistry (Honors)) Department of Chemistry, the University of Burdwan, Burdwan, India. Minor: Physics, Mathematics, and Environmental Science

RESEARCH GRANTS

I have been part of 46 proposals, out of which three are under consideration, and 22 were funded.

Awarded (Total: \$7,662,711; ~\$1,804,296 to Malakar CZR group).

2024 – Katimbo, A., Beegum, S., **Malakar, A.**, Snow, D.D., Panday, S., and Ray C. (2025-2027). U.S. Geological Survey 104G “Physics-based crop, soil, and groundwater modeling of nitrate transport to understand and manage groundwater contamination in agricultural regions.” \$288,030 (Malakar lab: 0.2%).

2024 – Luck, J., Mahmood, R., Drijber, R., Awada, T., Ge, Y., Mieno, T., Neale, C., **Malakar, A.**, Shi, Y., Kaiser, M., Iqbal, J., Balboa, G. R., Snow, D., Suyker, A., Weber, K., Ferguson, R., Pitla, S., and Koehler-Cole, K. (2021-2026). USDA Agriculture Research Service (ARS) “Nitrogen Research for Agriculture Transformation and Enhancement.” \$3,099,600 (Malakar lab: 1.6%).

2024 – Rose, D., Raimier-Tait, A., Auchtung, J., Frels, K., and **Malakar, A.**, (2024-2027). USDA-NIFA-AFRI Foundational and Applied Science Program “Reducing cadmium bioavailability from food by protecting the human gut microbiota from cadmium toxicity.” \$649,961 (Malakar lab: 3%).

2023 – **Malakar, A.** and Kaiser, M. (2023-2024). United States Geological Survey (USGS) 104(b). “Synergistic effect of biochar and biosolids to limit nitrate leaching beneath cropland.” \$15,000 (Malakar lab: 100%).

- 2023 – Katimbo, A., Beegum, S., **Malakar, A.**, La Menza Cafaro, N., Nakabuye, H. N., Rudnick, D., and Ray, C. (2023-2024). United States Geological Survey (USGS) 104(b). “Managing Irrigated Cropping Systems for Drought Resilience and Vadose Zone Nitrate Control: Field Evaluations and Modeling.” \$29,962 (Malakar lab: 0%).
- 2023 – Ray, C., **Malakar, A.**, Qiao, X., Katimbo, A., Mitra, A., (2023-2027). USDA-ARS Co-operative agreement, “Development of Data Bases for Model Development and Field Testing of Crop Models in Mid-West Farms.” \$892,164 (Malakar lab: 2%).
- 2023 – Snow, D. D., **Malakar, A.**, Daigh, A., Rudnick, D. and Miller, D. N., (2023-2025). Nebraska Corn Board “Wood carbon subsoil amendments for sustainable corn production on sandy irrigated soils.” \$95,506 (Malakar lab: 48%).
- 2023 – Ray, C., Weber, K. A., Schoengold, K., **Malakar, A.**, Haacker, E., and Snow, D. D. (2023-2024). Nebraska-EPSCoR. “Nitrogen in Water, Agriculture, Technology, and Environmental Research (N-WATER) in a Changing Climate - Planning Grant.” \$19,984 (Malakar lab: 0%).
- 2023 – Kaiser, M. and **Malakar, A.** (2023-2025). Nebraska Center for Energy Sciences Research. Energy Research Grants - Cycle 17. “Maximizing soil carbon storage and reducing nitrogen losses by combining biochar, cover crops, and no-till.” \$170,000 (Malakar lab: 48%).
- 2022 – Ray, C. and **Malakar, A.** (2022-2027). USDA-ARS Co-operative agreement, “Development of Data Bases for Model Development and Field Testing of Crop Models in Mid-West Farms.” \$790,000 (Malakar lab: 75%).
- 2022 – **Malakar, A.**, Snow, D. D., and Kalmakhanova M. S. (PI-KZ). (2022-2025). Ministry of Education and Science, Kazakhstan. “CECs in Urban Wastewater of Kazakhstan.” \$17,400 (Malakar lab: 100%).
- 2022 – **Malakar, A.**, Haacker, E., Ray, C., and Snow, D. D. (2022-2026). United States Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) Agriculture and Food Research Initiative (AFRI) Foundational and Applied Science Program A1411. “Identifying Reactive Nitrogen Dynamics in the Deep Vadose Zone to Protect Groundwater Quality.” \$749,861 (Malakar lab: 100%).
- 2021 – Iqbal, J., Johnson, L., **Malakar, A.**, Milander, J., Proctor, C., Schmidt, A., and Snow, D. D. (2022-2025). USDA-NIFA-AFRI Foundational and Applied Science Program A1701. “Demonstrating an integrated nutrient management approach for improving drinking groundwater quality in Nebraska.” \$298,631 (Malakar lab: 1%).
- 2021 – Kaiser, M., **Malakar, A.**, and Koehler-Cole, K. (2021-2024). University of Nebraska - Lincoln, Agricultural Research Division/Nebraska Agricultural Experiment Station. Hatch Multistate Enhancement Program. “Maximizing soil agro-ecosystem services by

combining cover cropping under no-till with application of biochar derived from waste wood of invasive Red Cedar.” \$149,275 (Malakar lab: 50%).

2021 – Snow, D.D., **Malakar, A.**, and Ray, C. (2021-2025). Upper Big Blue NRD. “Vadose Zone Nitrate Accumulation Upper Big Blue Natural Resources District, Relation to Fertilizer Management and Groundwater Nitrate Concentrations.” \$297,104 (Malakar lab: 36%).

2021 – Snow, D. D., **Malakar, A.**, Marzhan, K., Sagin, J., Niktin, Y., Sviderskiy, Y., Balaz, M., Uralbekov, B., and Satybaldiev, B. (2021-2022) American Councils US-Kazakhstani Universities Partnerships program grant. “Science with a Purpose: Improving Environmental Science in Kazakhstani Universities.” \$35,798 (Malakar lab: 0%).

2021 – Kaiser M., **Malakar A.**, and Snow D. D. (2021-2022). University of Nebraska - Lincoln, Office of Research and Economic Development, Research Council: Competitive Faculty Seed Grants - Layman Fund. “Identifying Nitrogen Dynamics in the Vadose Zone.” \$10,000 (Malakar lab: 100%).

2020 – Kaiser M., Snow D., Ray C., **Malakar A.**, Miller D., and D’Alessio, M. (2021-2022). United States Geological Survey (USGS) 104(b). “Evaluation of nitrogen-based redox processes in the vadose zone.” \$20,000 (Malakar lab: 100%).

2019 – **Malakar, A.** (2019-2020). University of Nebraska-Lincoln, Postdoctoral Travel Grant. “American Chemical Society Spring 2020 National Meeting and Expo.” \$750.

2016 – **Malakar, A.**, (2016) Water Advanced Research and Innovation (WARI) Fellowship, Department of Science and Technology, University of Nebraska Lincoln and Indo-US Science and Technology Forum. \$16,953.

2012 – **Malakar, A.**, (2012 – 2016) Senior Research Fellowship, Council for Scientific and Industrial Research, India. INR converted to USD: \$12,680, funding for Graduate Research Fellowship.

2010 – **Malakar, A.**, (2010 – 2012) Junior Research Fellowship, Council for Scientific and Industrial Research, India. INR converted to USD: \$9,052, funding for Graduate Research Fellowship.

Under Review

2024 – **Malakar, A.** (2025-2029), National Science Foundation CAREER Program. CAREER: Linking nitrogen biogeochemical transformation to geogenic contaminants in the vadose-phreatic zone boundary. Requested amount: \$777,420

2024 – Kaiser, M., **Malakar, A.**, and Katimbo, A. (2025-2028), USDA-NIFA AFRI Soil Health Program. In situ activation of biochar surfaces due to interaction with iron to enhance retention of nitrate, water, and organic matter in soil. Requested amount: \$749,932

2024 – Snow, D. D., Bartelt-Hunt, S. L., Li., Y., Aich, N., and **Malakar, A.**, (2025 – 2027) National Science Foundation (NSF) “MRI: Track 1 acquisition of a pyrolysis- gas chromatograph-tandem mass spectrometer to advance the science of biopolymers and micro- and nanoplastic pollution.” Requested: \$528,107.

PUBLICATIONS

Google Scholar (December 31st, 2024)

Citations 782; h-index 13; i-10-index 16

Link: <https://scholar.google.com/citations?user=VFILILAAAAAJ&hl=en>

Peer-reviewed Articles (*Italics: graduate student author; Underscore: undergraduate author*)

1. Ray, C. and **Malakar, A.** (2024) Nitrate contamination in Nebraska’s Ogallala aquifer. *Science* 386 (6719), 280. <https://doi.org/10.1126/science.adr3796>
2. Anuo, C.O., Li, L., Moreland, K.C., McFarlane, K.J., **Malakar, A.**, Cooper, J.A., Maharjan, B., and Kaiser, M. (2024) Storage and persistence of organic carbon in the upper three meters of soil under arable and native prairie land use. *Plant Soil*. <https://doi.org/10.1007/s11104-024-06850-0>
3. Anuo, C.O., Saleem, M., Fossum, B., Li, L., Cooper, J.A., **Malakar, A.**, Maharjan, B., and Kaiser, M. (2024) Land use selectively impacts soil carbon storage in particulate, water-extractable, and mineral-associated forms across pedogenetic horizons, *Geoderma* 449, 116992. <https://doi.org/10.1016/j.geoderma.2024.116992>
4. Mitra, A., Beegum, S., Fleisher, D., Reddy, V. R., Sun, W., Ray, C., and **Malakar, A.** (2024) Cotton yield prediction: A machine learning approach with field and synthetic data, *IEEE Access* 12, 101273-101288. <https://doi.org/10.1109/ACCESS.2024.3418139>
5. **Malakar, A.**, Snow, D.D., Rudnick, D., Maharajan, B., Kaiser, M., and Ray, C. (2024), Natural reactive iron dynamics in the agricultural soil of semi-arid to arid systems, *ACS Agricultural Science & Technology* 4(2), 601-609. <https://doi.org/10.1021/acsagscitech.3c00273>
6. Ndayishimiye, E., Dushimeyesu, J., Ukwishaka, Y., Ray, C., Fleisher, D., Timlin, D., Reddy, V., and **Malakar, A.** (2024) On-field agroecosystem research experience: an undergraduate perspective. *Journal of Contemporary Research & Education* 179(1), 40-52. <https://doi.org/10.1111/j.1936-704X.2024.3401.x>
7. *Srivastava, S., Kumar, N.,* **Malakar, A.**, Choudhury, S. D., Ray, C., and Roy, T., (2024) A Machine Learning-based Probabilistic Approach for Irrigation Scheduling. *Water Resources Management* 38(5), 1639-1653. <https://doi.org/10.1007/s11269-024-03861-5>
8. *Olson, C.,* **Malakar, A.**, D’Alessio, M., *Schumacher, N.*, Ray, C., and Snow, D. D., (2024) Evaluating Youth-led Citizen Science for Improved Monitoring of Domestic Well Water

Quality in Nebraska. *Environmental Science & Technology Water* 4(3), 307-316.

<https://doi.org/10.1021/acsestwater.3c00640>

9. **Malakar, A.**, Ray, C., D'Alessio, M., *Shields, J., Adams, C., Stange, M., Weber, K. A., and Snow, D. D. (2023)* Interplay of legacy irrigation and nitrogen fertilizer inputs to spatial variability of arsenic and uranium within the deep vadose zone. *Science of the Total Environment* 897, 165299. <https://doi.org/10.1016/j.scitotenv.2023.165299>
10. **Malakar, A.***, Das, S. *, *Islam, S., Singh, R., and Ray, S. (2023)* Leaching Performance of Nanotechnology-Induced High-Arsenic-Bearing Tooeleite-like Mineral Nanowaste. *Environments* 10, 185. <https://doi.org/10.3390/environments10100185> *Co-first author
11. Kalmakhanova, M. S., Diaz de Tuesta, J. L., **Malakar, A.**, Gomes, H. T., and Snow, D. D. (2023) Wastewater Treatment in Central Asia: Treatment Alternatives for Safe Water Reuse. *Sustainability* 15, 14949. <https://doi.org/10.3390/su152014949>
12. Li, Lidong, *Shields, J., Snow, D. D., Kaiser, M., and Malakar, A. (2023)* Labile carbon and soil texture control nitrogen transformation in deep vadose zone. *Science of the Total Environment*, 878, 163075. <https://doi.org/10.1016/j.scitotenv.2023.163075>
13. Satybaldiyev, B., Ismailova, B., *Nurpeisova, N., Kenges, K., Snow, D. D., Malakar, A., Taukebayev, O., and Bolat Uralbekov, B. (2023)* Downstream hydrochemistry and irrigation water quality of the Syr Darya, Aral Sea Basin, South Kazakhstan. *Water Supply*, 23(5), 2119. <https://doi.org/10.2166/ws.2023.114>
14. Beegum, S., **Malakar, A.**, Ray, C., and Snow, D. D. (2023). Importance of snowmelt on soil nitrate leaching to groundwater—A model study. *Journal of Contaminant Hydrology*, 255, 104163. <https://doi.org/10.1016/j.jconhyd.2023.104163>
15. Satybaldiyev, B., Ismailov, B., *Nurpeisov, N., Kenges, K., Snow, D., Malakar, A., and Uralbekov, B. (2023)* Evaluation of dissolved and acid-leachable trace element concentrations in relation to practical water quality standards in the Syr Darya, Aral Sea Basin, South Kazakhstan. *Chemosphere*, 313, 137465. <https://doi.org/10.1016/j.chemosphere.2022.137465>
16. Cooper, J. A. *, **Malakar, A.***, and Kaiser, M. (2023). Self-functionalization of soil-aged biochar surfaces increases nitrate retention. *Science of the Total Environment*, 861, pp.160644. <https://doi.org/10.1016/j.scitotenv.2022.160644> *Co-first author
17. Ray, C., **Malakar, A.**, and Snow, D. D. (2022). Response to Groundwater Storage Recovery Raises the Risk of Nitrate Pollution by Min et al. (Vol 56, #1 pages 8-9). *Environmental Science & Technology*, 56(5), pp. 2841-2842. <https://doi.org/10.1021/acs.est.2c00497>
18. Cooper, J., Drijber, R. A., **Malakar, A.**, Jin, V. L., Miller, D. N., and Kaiser, M. (2022). Evaluating coal char as an alternative to biochar for mitigating nutrient and carbon loss from manure amended soils – insights from a greenhouse experiment. *Journal of Environmental Quality*, 52(2), pp. 1-16. <https://doi.org/10.1002/jeq2.20327>

19. Borah, P., Chetan, Sharma, V., **Malakar, A.**, Bhinder, S. S., Kansal, S. K., and Devi, P. A. (2022). A Facile Method for detection and speciation of inorganic selenium with ion chromatography. *Chromatographia*, 85, pp. 213-218. <https://doi.org/10.1007/s10337-021-04120-0>
20. **Malakar, A.**, Snow, D. D., Kaiser, M., Shields, J., Maharjan, B., Walia, H., Rudnick, D., and Ray, C. (2022) Ferrihydrite enrichment in the rhizosphere of unsaturated soil improves nutrient retention while limiting arsenic and uranium plant uptake. *Science of the Total Environment*, 806(4), pp.150967. <https://doi.org/10.1016/j.scitotenv.2021.150967>
21. Panda, B., Chidambaram, S., Snow, D. D., **Malakar, A.**, Alagappan, R., Singh, D. K., and Elumalai, V. (2022). Source apportionment and health risk assessment of nitrate in foothill aquifers of Western Ghats, South India. *Ecotoxicology and Environmental Safety*, 229(1), pp. 113075. <https://doi.org/10.1016/j.ecoenv.2021.113075>
22. **Malakar, A.**, Singh, R., Westrop, J., Weber, K. A., Elofson, C. N., Kumar, M., and Snow, D. D. (2021) Occurrence of arsenite in surface and groundwater associated with a perennial stream located in Western Nebraska, USA. *Journal of Hazardous Materials*, 416, pp. 126170. <https://doi.org/10.1016/j.jhazmat.2021.126170>
23. **Malakar, A.**, Kanel, S. R., Ray, C., Snow, D. D., and Nadagouda, M. N. (2021). Nanomaterials in the environment, human exposure pathway, and health effects: A review. *Science of the Total Environment*, 759, pp.143470. <https://doi.org/10.1016/j.scitotenv.2020.143470> (Web of Science highly cited article)
24. **Malakar, A.**, Kaiser, M., Snow, D. D., Walia, H., Panda, B., and Ray, C. (2020). Ferrihydrite reduction increases arsenic and uranium bioavailability in unsaturated soil. *Environmental Science & Technology*, 54(21), pp.13839-13848. <https://doi.org/10.1021/acs.est.0c02670>
25. Islam, S., Das, S., Mishra, G., Das, B., **Malakar, A.**, Carlomagno, I., Meneghini, C., De Giudici, G., Gonçalves, L. P., Sousa, J. P., and Kolen'ko, Y. V. (2020). Coagulating and flocculating ferrihydrite: application of zinc acetate salt. *Environmental Science: Water Research & Technology*, 6(8), 2057-2064. <https://doi.org/10.1039/D0EW00357C>
26. Snow, D. D., Cassada, D. A., Biswas, S., **Malakar, A.**, D'Alessio, M., Marshall, A. H. L., and Sallach, J. B. (2020). Detection, occurrence, and fate of emerging contaminants in agricultural environments (2020). *Water Environment Research*, 92(10), 1741-1750. <https://doi.org/10.1002/wer.1429>
27. Panday, D., Mikha, M. M., Collins, H. P., Jin, V. L., Kaiser, M., Cooper, J., **Malakar, A.**, and Maharjan, B. (2019). Optimum rates of surface-applied coal char decreased soil ammonia volatilization loss. *Journal of Environmental Quality*, 49(2), pp. 256-267. <https://doi.org/10.1002/jeq2.20023>
28. **Malakar, A.**, Snow, D. D., and Ray, C. (2019). Irrigation water quality — A contemporary perspective. *Water*, 11(7), 1482. <https://doi.org/10.3390/w11071482> (Web of Science highly cited article)

29. Snow, D. D., Cassada, D. A., Biswas, S., **Malakar, A.**, D'Alessio, M., Carter, L. J., Johnson, R. D., and Sallach, J. B. (2019) Detection, occurrence, and fate of emerging contaminants in agricultural environments (2019). *Water Environment Research*, 91(10), 1103-1113.
<https://doi.org/10.1002/wer.1204>
30. **Malakar, A.**, Islam, S., Ali, M. A., and Ray, S. (2016). Rapid decadal evolution in the groundwater arsenic content of Kolkata, India and its correlation with the practices of her dwellers. *Environmental Monitoring and Assessment*, 188(10), 1-11.
<https://doi.org/10.1007/s10661-016-5592-9>
31. **Malakar, A.**, Das, B., Islam, S., Meneghini, C., De Giudici, G., Merlini, M., Kolen'ko, Y. V., Iadecola, A., Aquilanti, G., Acharya, S., and Ray, S. (2016). Efficient artificial mineralization route to decontaminate Arsenic (III) polluted water – The Tooeleite Way. *Scientific Reports*, 6(1), 1-10. <https://doi.org/10.1038/srep26031>
32. **Malakar, A.**, Das, B., Sengupta, S., Acharya, S., and Ray, S. (2014). ZnS nanorod is an efficient heavy metal ion extractor from water. *Journal of Water Process Engineering*, 3, pp.74-81. <https://doi.org/10.1016/j.jwpe.2014.05.012>

Patent

33. **Malakar, A.**, Ray, C., and Snow, D. D., (2024). Patent Published US-2024-0101489-A1, “Methods and Compositions for Improving Plant Growth,” United States.
<https://patents.google.com/patent/US20240101489A1/en>
34. Ray, S., Islam, S., and **Malakar, A.**, (2020). Patent, “Method for instantaneous 2-line ferrihydrite synthesis in-situ using layered hydroxides and its consequent use in removing arsenic and other contaminants from groundwater and industrial wastewater,” 315405, Regular, India.
35. **Malakar, A.**, Das, B., Islam, S., Acharya, S., and Ray, S., (2020). Patent, “New Method for permanent removal of arsenic(III) from contaminated water,” 316110, Regular, India.

Book

36. Singh, P., Devi, P., **Malakar, A.**, and Snow, D. D. eds. (2021). *Selenium Contamination in Water*. Wiley, United Kingdom.

Book Chapters

37. Kanel, S. R., Nadagouda, M. N., Nakarmi, A., **Malakar, A.**, Ray, C., and Pokhrel, L. R., (2022). Assessment of health, safety, and economics of surface-modified nanomaterials for catalytic applications: a review In. *Surface Modified Nanomaterials for Applications in Catalysis*. Elsevier
38. **Malakar, A.**, Cooper, J. A., (2022). Nanotechnology at the Juncture of Water, Food, and Energy Nexus: Boon or Bane? In: Ray, C., Muddu, S., Sharma, S. (eds) *Food, Energy, and Water Nexus*. Springer, Cham. https://doi.org/10.1007/978-3-030-85728-8_13

39. Panda, B., Chidambaram, S., and **Malakar, A.**, (2021). Survival of SARS-CoV-2 in untreated and treated wastewater - A Review. In *Environmental Resilience and Transformation in times of COVID-19*. Elsevier
40. **Malakar, A.** and Snow, D. D., (2020). Nanoparticles as sources of inorganic water pollutants. In *Inorganic Pollutants in Water* (pp. 337-370). Elsevier
41. Panda, B., Radha, V. D., Chidambaram, S., **Malakar, A.**, Thilagavathi, R., Manikandan, S., Thivya, C., Ramanathan, A.L., and Ganesh, N., (2019). Fluoride contamination in groundwater—A GIS and geostatistics reappraisal. In *GIS and Geostatistical Techniques for Groundwater Science* (pp.309-322). Elsevier

Reports

42. Snow, D. D., **Malakar, A.**, Dong, X., Glause, K., (2023) Bazile Groundwater Management Area (BGMA) Vadose Zone Final Report.
43. Snow, D. D., **Malakar, A.**, Adams, C., Ray, C., (2020) Vadose Zone Nitrate-N Study: Final Report Hastings Wellhead Protection Area: City of Hastings, NE.

Conference abstracts (oral/poster) (*Italics: graduate student author; Underscore: undergraduate author*)

44. Fossum, B., Koehler-Cole, K., **Malakar, A.** And Kaiser, M. (2024) Application of Biochar to Improve Soil Health under Corn/Soybean Rotations - Insights from Field Experiments in Nebraska, B23F-1617 [Poster], AGU Fall Meeting, December 09 – 13, Washington, D.C.
45. Kaiser, M., Anuo, C., Sleem, M., Fossum, B., Li, L., Cooper, J., **Malakar, A.** And Maharjan, B. (2024) Application of Biochar to Improve Soil Health under Corn/Soybean Rotations - Insights from Field Experiments in Nebraska, B43F-1618, AGU Fall Meeting, December 09 – 13, Washington, D.C.
46. Fleisher, D., Yeşilköy, S., Timlin, D., Beegum, S., Mitra, A., Wang, Z., **Malakar, A.**, Bethi, S. K., Han, E., Reddy, V., *Ndayishimiye, E.*, Ray, C., *Dushimeyesu, J.* and *Ukwishaka, Y.* Integrating on-farm Crop Production Data with In-Season Risk Management Decision Support Software, GC53D-0412, AGU Fall Meeting, December 09 – 13, Washington, D.C.
47. Timlin, D., Beegum, S., Katimbo, A., Wang, Z., Rudnick, D., Proctor, C., Nakabuye, H. N., Fleisher, D., Ray, C., **Malakar, A.**, and Reddy, V. The Use of a Crop Simulation Model to Explore Water and Nitrogen Use Scenarios to Minimize Nitrogen Transport in Irrigated Maize in Nebraska, H51K-0836, AGU Fall Meeting, December 09 – 13, Washington, D.C.
48. Timlin, D., Beegum, S., Katimbo, A., Wang, Z., Rudnick, D., Proctor, C. A., Nakabuye, H. N., Fleisher, D. H., Ray, C., **Malakar, A.** and Reddy, V. (2024) Process-Based Crop Models Have a Useful Role in Agricultural Field Trials [Abstract]. ASA, CSSA, SSSA International Annual Meeting, San Antonio, TX.
<https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Paper/161634>

49. Kumar, C., Ukwishaka, Y., Snow, D.D., Miller, D., Ray, C., Fleisher, D., Timlin, D., Reddy, V. and **Malakar, A. (2024)** Impact of irrigation and fertilization practices on reactive nitrogen dynamics in the deep vadose zone: Insights for sustainable groundwater quality management. Oral Presentation – ACS National Symposium and Expo Fall 2024, 18 – 21 August 2024, 4104982, Denver, Colorado.
50. Dong, X., Snow, D. D., **Malakar, A. (2024)** Controlling nitrate leaching with subsoil carbon injection. Oral Presentation – ACS National Symposium and Expo Fall 2024, 18 – 21 August 2024, 4106934, Denver, Colorado.
51. Dushimeyesu, J., Miller, D., Ray, C., Timlin, D., Fleisher, D., Reddy, V. and **Malakar, A. (2024)** Nitrous oxide production in undisturbed subsoil: A column experiment. Oral Presentation – ACS National Symposium and Expo Fall 2024, 18 – 21 August 2024, 4110156, Denver, Colorado.
52. Fossum, B., **Malakar, A.**, Koehler-Cole, K, and Kaiser, M. **(2024)** Increasing carbon storage and nitrate retention in highly productive soils under corn and soybean by application of biochar derived from an invasive tree species. Poster Presentation – ACS National Symposium and Expo Fall 2024, 18 – 21 August 2024, 4094432, Denver, Colorado.
53. Fossum, B., Koehler-Cole, K, Kaiser, M., and **Malakar, A. (2024)** Field experimental evidence for biochar surface functionalization with iron oxides and links to nitrate retention mechanisms. Oral Presentation – ACS National Symposium and Expo Fall 2024, 18 – 21 August 2024, 4092345, Denver, Colorado.
54. Collins, K., Franz, T., Chang, E., and **Malakar, A. (2024)** Monitoring semi-immobile and mobile weathering products in agricultural soils to quantify initial carbon capture of an enhanced rock weathering project deployed in Nebraska. Poster Presentation – ACS National Symposium and Expo Fall 2024, 18 – 21 August 2024, 4101672, Denver, Colorado.
55. **Malakar, A.**, Fossum, B., Kaiser, M. **(2024)** Field-evidence of biochar functionalization promoting nitrate retention and enhancing carbon levels Oral Presentation at International Conference on Sustainable Agricultural Development with Climate Smart Systems, Bhubaneswar, Odisha, India on July 19th, 2024.
56. Dong, X., Snow, D. D., and **Malakar A., (2023)** Controlling Nitrate Leaching in Subsoil with Woodchips Injection. Poster Presentation – ASA, CSSA, SSSA International Annual Meeting 2023, October 29 – November 1, 1495, St. Louis, Missouri.
57. Nandgude, S., *Shelar, R.*, Ray, C., Beegum, S., and **Malakar, A., (2023)** Influence of Conservation Measures on Soil and Carbon Sequestration in Watershed. Poster Presentation – ASA, CSSA, SSSA International Annual Meeting 2023, October 29 – November 1, 1391, St. Louis, Missouri.
58. Fossum, B., **Malakar, A.**, Koehler-Cole, K., and Kaiser, M. **(2023)** Linking Biochar Surface Modification by Iron Oxides Under Field Conditions with Enhanced Nitrate Retention. Oral Presentation – ASA, CSSA, SSSA International Annual Meeting 2023, October 29 – November 1, 1495, St. Louis, Missouri.

59. *Ukwishaka, Y.* and **Malakar, A.**, (2023). Redox transformation of inorganic nitrogen species impacts on Uranium mobilization in the vadose zone. Oral Presentation – ACS National Symposium and Expo Fall 2023, 13 – 17 August 2023, 3925859, San Francisco, California.
60. *Ukwishaka, Y.*, Kaiser, M., Snow, D. D., Miller, D. N., Ray, C., and **Malakar, A.**, (2023). Redox driven transformation of nitrogen species across the vadose zone: Insights from column experiments. Oral Presentation – ACS National Symposium and Expo Spring 2023, 26 – 23 March 2023, 548810, Indianapolis, Indiana.
61. *Srivastava, S.*, *Kumar, N.*, **Malakar, A.**, Das Choudhury, S., Ray, C., Roy, T., (2023). An ML-based Probabilistic Approach for Irrigation Scheduling. European Geophysical Union General Assembly 2023, 24 – 28 April, 2023, EGU23-8388, Vienna, Austria.
62. Kaiser M., *Anuo C.*, Moreland K. C., McFarlane K. J., Li. L., Cooper J., and **Malakar A.**, (2022). Storage and Persistence of Organic Carbon in 0 to 3 m Soil Depth: Insights from 22 Arable and Native Prairie Sites in Nebraska, AGU Fall Meeting, December 11 – 16, Chicago, IL.
63. *Ukwishaka, Y.*, Fleisher, D., Timlin, D., Ray, C., Reddy, V., and **Malakar, A.**, (2022). Developing Next Generation Cropping System Model for Efficient Agroecosystem [Poster session]. Water Integrated Cropping System (WICS) Conference, November 30 – December 01, Lincoln, Nebraska.
64. Kaiser M., Li, L., Hosseiniaghdam, E., Snow, D. D., **Malakar A.**, *Shields, J.*, Vormstein, S., Piepho, H. -P., and Ludwig, B., (2022). 2022 ASA, CSSA, SSSA International Annual Meeting, November 06 – 09, Baltimore, MD.
65. *Fossum, B.*, **Malakar, A.**, Koehler-Cole, K., and Kaiser, M., (2022). Combining Application of Biochar with Cover Cropping Under No-till to Improve Carbon, Water, and Nutrient Retention in Agricultural Soil [Poster session], ASA, CSSA, SSSA International Annual Meeting, November 06 – 09, Baltimore, MD.
66. *Ukwishaka, Y.*, Fleisher, D., Timlin, D., Ray, C., Reddy, V., and **Malakar, A.**, (2022). Developing Next Generation Cropping System Model for Efficient Agroecosystem [Poster session]. WaterSmart Innovations Conference & Exposition, October 04 – 06, Las Vegas, Nevada.
67. *Ndayishimiye, E.*, *Ishimwe, J.*, *Dushimeyesu, J.*, *Ukwishaka, Y.*, Beegum, S., Sun, W., Fleisher, D., Timlin, D., Ray, C., Reddy, V. and **Malakar, A.**, (2022). Crop Growth and Soil Studies For Model Verification And Validation [Poster session]. College of Agriculture and Natural Resource's Undergraduate Scholars Program (CUSP) Experiential Learning Expo, September 02, Lincoln, Nebraska.
68. Kaiser, M., Cooper, J. A., Drijber, R., **Malakar, A.**, Jin, V. L., and Miller, D. N., (2021). Efficiency of coal char versus biochar in reducing nutrient and carbon losses from manure amended soils - Insights from a greenhouse experiment, AGU Fall Meeting 2021, December 13 – 17.

69. **Malakar, A.**, Ray, C., Rudnick, D., Maharjan, B., and Snow, D. D., (2020). Natural iron dynamics in irrigated soils, SETAC North American 41st Annual Meeting, November 15 – 19, Platform Oral Presentation.
70. **Malakar, A.**, Ray, C., Snow, D. D., Saluja, M.[^], Cooper, J. A., Kaiser, M., Walia, H., and Roberts, T., (2020). Ferrihydrite soil amendment limit arsenic uptake in rice by promoting iron plaque formation, ACS Fall 2020 Virtual Meeting & Expo, August 17 – 20, Oral Presentation.
71. **Malakar, A.**, Kaiser, M., Snow, D. D., and Ray, C., (2020). Ferrihydrite dissolution at the root zone of crops under semi-arid condition controls the plant uptake of uranium and arsenic (final paper number: ENVR 243), ACS Spring 2020 National Meeting & Expo, March 22 – 26, Oral presentation.
72. **Malakar, A.**, Kaiser, M., Snow, D. D., and Ray, C., (2019). Impact of ferrihydrite transformation on the bioavailability of arsenic and uranium in intermittently irrigated soils, AGU Fall Meeting 2019, December 7 – 11.
73. Cooper, J. A., **Malakar, A.** and Kaiser, M., (2019). Self-Functionalization of Soil-Aged Biochar Surfaces by Iron Increases Nitrate Retention, AGU Fall Meeting 2019, December 7 – 11.
74. Snow, D. D. and **Malakar, A.**, (2018). Detecting changing water quality in intensive food production systems, Indo-US bilateral workshop on Water-Food-Energy-Climate nexus: A perspective towards a sustainable future (WFEC nexus 2018).
75. **Malakar, A.**, (2016). The tooeliete story, International Conference on Industrial Chemistry June 27 – 28.

Media Coverage of Research

76. Nebraska Rural Radio Association “Nebraska Water Center researchers conduct statewide project to characterize nitrogen transformation beneath ground surface,” *Rural Radio Network*, August 12th, 2023. URL: <https://ruralradio.com/rnn/news/nebraska-water-center-researchers-conduct-statewide-project-to-characterize-nitrogen-transformation-beneath-ground-surface/>
77. *Ukwishaka, Y.*, “Nebraska Water Center Researchers Conduct Statewide Project to Characterize Nitrogen Transformation Beneath the Ground Surface,” IANR Cropwatch, August 11th, 2023. URL: <https://cropwatch.unl.edu/2023/nebraska-water-center-researchers-conduct-statewide-project-characterize-nitrogen>
78. Schrage, S., “Research Roundup,” Nebraska Today August 3rd, 2023. URL: <https://news.unl.edu/newsrooms/today/article/research-roundup-aug-3/>
79. *Ukwishaka, Y.*, “Nebraska Water Center Researchers Conduct Statewide Project to Characterize Nitrogen Transformation Beneath the Ground Surface,” SNR News Story, August 2nd, 2023. URL: <https://snr.unl.edu/aboutus/what/newstory.aspx?fid=1069>

80. Lyon, C., “Homestead works with UNL for soil research.” *Beatrice Daily Sun*, June 28th, **2023**. URL: https://beatricedailysun.com/news/local/homestead-works-with-unl-for-soil-research/article_0eac0e12-15bb-11ee-9139-cfa81e3812cd.html
81. Alamdari, N. and Hansen, M., “Can new technology save Nebraska’s water?” *Lincoln Journal Star*, December 31st, **2022**. Readership 76,374. URL: https://journalstar.com/news/state-and-regional/nebraska/can-new-technology-save-nebraska-from-high-nitrate/article_a2da6077-b0fd-552e-8581-d2da84e3a449.html
82. Alamdari, N. and Hansen, M., “Can new technology save Nebraska’s water?” *Flatwater Free Press*, December 24th, **2022**. URL: <https://flatwaterfreepress.org/can-new-technology-save-nebraska-from-high-nitrate/>
83. Schrage, S. “Adding mineral to irrigation may lower toxic elements in soils.” *Phys.Org*, November 24th, **2021**. URL: <https://phys.org/news/2021-11-adding-mineral-irrigation-toxic-elements.html>
84. Schrage, S. “Without a trace? Adding mineral to irrigation may lower toxic elements in soils.” *Nebraska Today*, November 24th, **2021**. URL: <https://news.unl.edu/newsrooms/today/article/without-a-trace-adding-mineral-to-irrigation-may-lower-toxic-elements-in/>
85. Niyogi, S. “City losing fight against arsenic; north worst-hit.” *Times of India*, October 16th, **2016**. Readership 1,590,784.
86. Ghosal, A. “Arsenic contamination in water alarming in 100 Kolkata Municipal Corporation wards.” *The Indian Express*, October 14th, **2016**. Readership 312,500. URL: <https://indianexpress.com/article/india/india-news-india/kolkata-municipal-corporation-wards-contaminated-arsenic-water-kolkata-3081555/>
87. Karenjay, J. “Arsenic toxicity in more than 100 wards of the megacity.” *Ei Samay*, October 14th, **2016**. Readership 243,273.
88. Karenjay, J. “Arsenic free water Bengal scientists show a path forward.” *Ei Samay*, July 06th, **2016**. Readership 243,273.

TEACHING EXPERIENCE

Fall 2024	Soil Carbon & Nitrogen Dynamics (AGRO985-Graduate Level), The University of Nebraska, Lincoln, Nebraska, USA (Guest Lecture)
Fall 2024	Environmental Geochemistry (Independent Course) (NRES899-Graduate Level), The University of Nebraska, Lincoln, Nebraska, USA (Independently developed course) (Enrollment 4)
Spring 2024	Environmental Geochemistry (Independent Course) (NRES899-Graduate Level), The University of Nebraska, Lincoln, Nebraska, USA (Independently developed course) (Enrollment 1)

- Spring 2024 Fundamentals of Environmental Sampling and Laboratory (NRES 319/320-Undergraduate level). The University of Nebraska, Lincoln, Nebraska, USA (Enrollment 28/26)
- Fall 2023 Introduction to Vadose zone – Groundwater Systems (NRES299-Undergraduate level), The University of Nebraska, Lincoln, Nebraska, USA (Independently developed course) (Enrollment 5)
- Fall 2023 Soil Carbon & Nitrogen Dynamics (AGRO985-Graduate Level), The University of Nebraska, Lincoln, Nebraska, USA (Guest Lecture)
- Fall 2022 Soil Carbon & Nitrogen Dynamics (AGRO985-Graduate Level), The University of Nebraska, Lincoln, Nebraska, USA (Guest Lecture)
- Spring 2021 Fundamentals of Environmental Sampling and Laboratory (NRES 319/320-Undergraduate level). The University of Nebraska, Lincoln, Nebraska, USA (Enrollment 13/14)
- Spring 2021 Water Quality Strategy (NRES475/875-Undergraduate/Graduate level) The University of Nebraska, Lincoln, Nebraska, USA (Guest Lecture)
- Spring 2020 Fundamentals of Environmental Sampling and Laboratory (NRES 319/320-Undergraduate level). The University of Nebraska, Lincoln, Nebraska, USA (Enrollment 13/14)

PROFESSIONAL SKILLS

1. Language: English (fluent), Bengali (native), and Hindi (basic-intermediate).
2. Field Trials: Trained in establishing field trials and experimental designs. Environmental sampling and study design in different environmental compartments.
3. Laboratory: Proficient in soil and water geochemical testing and plant analyses. Controlled greenhouse, column, and batch experiments.
4. Software: Knowledgeable in computer science, including Office Package, Internet, Webpage design; Statistical Software: OriginPro, RStudio, SigmaPlot, and SAS; PHREEQC (chemical equilibrium model for speciation of soil solution, liquid-state), HYDRUS-1D (reactive transport model), RZWQM2 (simulates major physical, chemical, and biological processes in an agricultural crop production system), COMET (NRCS carbon management tool); High energy spectroscopy software: KolXPD (for X-ray photoelectron analysis), Demeter (Bruce Ravel's collection of analysis programs (Athena, Artemis, and Hephaestus) for X-ray absorption spectroscopy)
5. Instrumentation: Operated Inductively Couple Plasma (ICP) Optical Emission and Mass Spectroscopy (OES/MS, for multi-elemental analyses), X-ray diffraction (XRD, for soil mineralogy analyses), Nuclear Magnetic Resonance Spectroscopy (NMR, for soil solution

speciation), X-ray fluorescence (XRF), μ XRF (X-ray fluorescence microanalysis for elements mapping), High Resolution Transmission Electron Microscopy (HR-TEM), Scanning Electron Microscopy (SEM), X-ray Photoelectron spectroscopy (XPS, laboratory and synchrotron beamline), X-ray Absorption Near Edge Spectroscopy (XANES, synchrotron beamline), Extended X-ray absorption fine structure (EXAFS, synchrotron beamline), UV-Vis, FT-IR, Surface Area Analyzer, and other basic soil and water analytical instruments.

AWARDS

- 2015 – Young Scientist Award, Materials Research Society of India (MRSI).
- 2015 – Best Poster Award, Indian Innovations in Materials Research: New Materials and Processes (IIMR15) Conference, Kolkata, India.
- 2014 – Best Poster Award, In-house Science Day Celebration, Indian Association for the Cultivation of Science, Kolkata, India.
- 2010 – Graduate Aptitude Test for Engineering (GATE), Indian Institute of Technology, India.
- 2010 – Highly Competitive and Prestigious Shyama Prasad Mukherjee (SPM) Fellowship, Selected in Final Round, Council for Scientific and Industrial Research, India.
- 2010 – Master of Sciences, Distinction with first-class, Banaras Hindu University, Varanasi, India.
- 2009 – National Eligibility Test (NET), Among the top 10 candidate of the 2009-2010 session, Council for Scientific and Industrial Research, India.

INVITED PRESENTATIONS

- 2024 – Converting waste wood to biochar to lock in generational carbon and reduce nitrate loss in agroecosystem, Invited Speaker at “14th International Conference on Sustainable Waste Management & circular Economy and IPLA Global Forum 2024, Visakhapatnam, Andhra Pradesh, India on November 29th, 2024.
- 2024 – Building from Vadose Zone Data to Solutions, Invited Speaker at “2024 Nebraska Water Center Conference,” University of Nebraska-Lincoln, Lincoln, Nebraska, USA on October 9th, 2024.
- 2024 – A Way to Protect Groundwater Quality: Understanding Reactive Nitrogen Transformation in the Vadose Zone, Keynote Speaker at “Sustainability of Water Sources in Rural Areas,” Center for Sustainable Drinking Water, Indian Institute of Technology, Jodhpur, India on September 25th, 2024.
- 2024 – Being Climate-Smart to Put Carbon Back in Agricultural Soil: The Biochar Way!, Keynote Speaker at “Protocols for Climate Smart Agriculture & Agriculture Produce

- Certification: A Project for Future India,” organized by Indian Millet Initiative and Career Point University, Hamirpur, India on August 6th, 2024.
- 2024 – Natural engineering of biochar surfaces to enhance sustainable agro-ecosystems, Invited Speaker at “International Conference on Engineered Materials For Sustainable Development,” Punjab Engineering College, Chandigarh, India on July 25th, 2024.
- 2024 – Natural engineering of biochar surfaces to enhance sustainable agro-ecosystems, Invited Speaker at “International Conference on Engineered Materials For Sustainable Development,” Punjab Engineering College, Chandigarh, India on July 25th, 2024.
- 2024 – Identifying Chemistry of Critical Zone to Protect Groundwater Quality, Invited Speaker by Academy of Scientific and Innovative Research (AcSIR) at Council for Scientific and Industrial Research (CSIR) – Central Scientific Instruments Organisation, Chandigarh, India on July 23rd, 2024.
- 2024 – Chemistry in the Critical Zone to Protect Groundwater Quality, Invited Speaker at Indian Association for the Cultivation of Science, Kolkata, India on July 15th, 2024.
- 2024 – Chemistry in the Critical Zone to Protect Groundwater Quality, Invited Speaker at Banwarilal Bhalotia College, Asansol, West Bengal, India on July 11th, 2024.
- 2024 – Understanding Nitrogen in Vadose Zone, Invited Speaker at “N-WATER Planning Meeting,” University of Nebraska-Lincoln, Lincoln, Nebraska on April 19th, 2024.
- 2024 – Mitigating Nitrate in the Vadose Zone: Towards Developing Critical Zone-Centric Technologies, Invited Speaker at “Water Resources Advisory Panel meeting,” University of Nebraska-Lincoln, Lincoln, Nebraska on March 12th, 2024.
- 2023 – Putting Chemistry to Work for Supplying Clean Water, Foreign Expert Lecture, Vellore Institute of Technology, Vellore, India on June 6th, 2023.
- 2022 – Critical Aspect of Vadose Zone to Protect Groundwater Resources, International Conference on Higher Education Institute Challenges Solutions for Sustainable Development Goals 2022 (ICSDG 2022), Chennai, India on November 16th, 2022.
- 2021 – Identifying Anoxic Microsites at Root Zone of Unsaturated Soil, Water and Air Research, Initiative for Societal Health (WaARISH 2021), SRM Institute of Science and Technology, Chennai, India on August 25th, 2021.
- 2020 – Nano-biogeochemistry of iron oxides, Department of Agronomy and Horticulture, University of Nebraska, Lincoln, Nebraska, USA on September 18th, 2020.
- 2019 – Biogeochemistry of iron oxides, Department of Agronomy and Horticulture, University of Nebraska, Lincoln, Nebraska, USA on October 19th, 2019.
- 2019 – Role of Ferrihydrite at the Root Zone in Uptake of Arsenic, Selenium and Uranium by Crops in Intermittent Irrigation System Central Scientific Instruments Organisation (CSIR-CSIO), Chandigarh, India on September 19th, 2019.

- 2018 – Agrochemical Impacts on Human and Environmental Health: Mechanisms and Mitigation (Multistate Hatch Project W3045), Annual ARD Hatch Multistate Project Director Meeting on June 12th, 2018.
- 2018 – Arsenic - A global threat, which calls for a localized solution, School of Natural Resources, University of Nebraska, Lincoln, USA, February 6th, 2018.
- 2016 – The tooeleite story- An arsenic mineral, Nebraska Water Center, University of Nebraska, Lincoln, Nebraska, USA on June 8th, 2016.
- 2014 – The tooeleite story- An arsenic mineral, Università degli Studi di Cagliari, Cagliari, Italy, October 17th, 2014.
- 2014 – Forward Osmosis (FO) as newest tool for effective desalination of water, Università Degli Studi Roma Tre, Rome, Italy on October 16th, 2014.

Attended

- 2023 – From Idea to Startup: A Two-Day Workshop, June 28 – 29, Organized by NUtech Ventures, Lincoln, NE, USA.
- 2023 – Business Model Canvas, February 10 and 24, Organized by NUtech Ventures, Lincoln, NE, USA.
- 2023 – Water for Food Global Conference, May 8 – 11, Organized by Daugherty Water for Food Global Institute, Lincoln, NE, USA.
- 2022 – AGU Fall Meeting 2022, December 7 – 11, Organized by American Geophysical Union, Chicago, IL, USA.
- 2022 – ACS Campaign for a Sustainable Future Zero Hunger Summit, December 5 – 8, Organized by American Chemical Society, Online.
- 2022 – Water Integrated Cropping System (WICS) Conference, November 30 – December 01, Lincoln, Nebraska.
- 2022 – International Conference on Higher Education Institute Challenges Solutions for Sustainable Development Goals 2022 (ICS DG 2022), Organized by SRM Institute of Science and Technology, Chennai, India, November 16th (Virtual).
- 2022 Faculty of Color Symposium: Navigating Educational Spaces in an Age of Racial Distress, Uncertainty, and Anxiety, Organized by Office of Diversity and Inclusion, November 4th, Nebraska Union, University of Nebraska, Lincoln, Nebraska, USA.
- 2022 IO2022: Innovation Accelerated, Organized by InsideOutside.io, September 19 – 20, Nebraska Innovation Campus, Lincoln, Nebraska, USA.

- 2022 – AgMIP Conference - Making Climate-Smart Agriculture Work, May 24 – 26, Supported by National Institute for Food and Agriculture, Online.
- 2022 – International Conference on Higher Education Institute Challenges Solutions for Sustainable Development Goals 2022 (ICS DG 2022), Chennai, India, November 16th.
- 2021 – Water and Air Research, Initiative for Societal Health (WaARISH 2021), Organized by SRM Institute of Science and Technology, Chennai, India, August 25th, 2021 (Virtual).
- 2020 – ACS Fall 2020 Virtual Meeting & Expo, August 17 – 20, Organized by American Chemical Society, Virtual.
- 2020 – ACS Spring 2020 National Meeting & Expo, March 22 – 26, Organized by American Chemical Society, Philadelphia, PA, USA (Virtual).
- 2019 – AGU Fall Meeting 2019, December 7 – 11, Organized by American Geophysical Union, San Francisco, CA, USA.
- 2018 – Nebraska Water Symposium on October 24 – 26, Organized by Nebraska Water Center at the Water for Food Global Institute, University of Nebraska-Lincoln, USA.
- 2018 – The 2018 MOISST workshop: From soil moisture observations to actionable decision, June 4 – 7, University of Nebraska-Lincoln, Lincoln, Nebraska, USA.
- 2018 – Write Winning Grant Proposals, March 16, University of Nebraska, Lincoln, Nebraska, USA
- 2017 – Nebraska Water Symposium on October 26 – 27, Organized by Nebraska Water Center at the Water for Food Global Institute, University of Nebraska-Lincoln, USA.
- 2016 – Nebraska Water Symposium on October 20, Organized by Nebraska Water Center at the Water for Food Global Institute, University of Nebraska-Lincoln, USA.
- 2014 – Advances in Nanomaterials using Synchrotron Techniques (ANST-2014)” December 11-13, Saha Institute of Nuclear Physics, Kolkata, India.

INTERNATIONAL VISIT

- 2024 – Jal Jeevan Mission, Indian Institute of Technology, Jodhpur, India, from July 21 – 23.
- 2024 – Council for Scientific and Industrial Research (CSIR) – Central Scientific Instruments Organisation, Chandigarh, India from July 23 – 26.
- 2024 – Indian Association for the Cultivation of Science, Kolkata, India, from July 15 - 16.
- 2024 – Banwarilal Bhalotia College, Asansol, West Bengal, India, on July 11.
- 2016 – Water Advanced Research and Innovation Internship, part of Ph.D. program at University of Nebraska, Lincoln, Nebraska, USA, from May 14 – November 2.

2015 – Visiting scholar at University of Cagliari, Cagliari, Italy for ARSELLA Project, from May 3 - 7.

2015 – Synchrotron experiments, XAFS and MCX beamline at Elettra, Trieste, Italy from April 22 – May 2nd May.

2014 – Synchrotron experiments, Materials Science and XAFS beamline at Elettra, Trieste, Italy, November 25 – December 6.

2014 – Visiting scholar at University of Cagliari, Cagliari, Italy for ARSELLA Project, from October -November.

2014 – Synchrotron experiment, μ -XAS at BM23 beamline of ESRF, Grenoble, France, November 14-16.

2013 – Synchrotron experiment, XAFS beamline at Elettra, Trieste, Italy, October 27 – November 1.

PROFESSIONAL SERVICES

International Grant Reviewer	Swiss National Science Foundation, 2023.
Panelist	United States Department of Agriculture (USDA), National Institute of Food and Agriculture (NIFA) Agricultural Food and Research Initiative (AFRI) – Flagship grant, Water Quality and Quantity Panel – 2022 and 2024.
Panelist	United States Department of Agriculture (USDA), Small Business Innovation Research and Technology Transfer Program (SBIR/STTR) Conservation of Natural Resources Panel – 2024.
Associate Editor	Frontiers in Environmental Science, 2024 – Present
Editorial Advisory Board	American Chemical Society Agricultural Science & Technology Journal, 2023 – Present.

Journal Reviewer	Environmental Science & Technology; Water Research; Biochar; Environment International; Science of the Total Environment; Desalination; Chemosensors; Journal of Water Process Engineering; Environmental Nanotechnology, Monitoring & Management; ACS Agricultural Science & Technology; Geoderma Regional; Agronomy; Journal of Environmental Management; Journal of Environmental Science; Water; Environmental Geochemistry and Health; Sustainability; Remote Sensing; Journal of Applied Polymer Science; Urban Water Journal; Frontiers of Environmental Science.
Internal Grant Reviewer	DWFI Graduate Fellow Program Reviewer, 2023, 2024. Graduate Travel Advisory Program Reviewer, 2023. Collaborative Initiative Grant at the University of Nebraska, 2022. Undergraduate Creative Activities and Research Experience (UCARE) program at the University of Nebraska-Lincoln (UNL)
Member	W4045: Agrochemical Impacts on Human and Environmental Health: Mechanisms And Mitigation, USDA Multi State Hatch Project 2022 – Present American Chemical Society (ACS) 2018 – Present American Geophysical Union (AGU) 2018 – Present Royal Society of Chemistry (RSC) 2020 – Present Soil Science Society of America (SSSA) 2022 – Present American Association for the Advancement of Science (AAAS) 2023 – Present
2024	Acting Chair-elect of American Chemical Society Omaha Section.
2024	Session Organizer, American Chemical Society National Meeting & Expo Fall 2024, Denver, Colorado, USA.
2024	Session Organizer, American Chemical Society Midwest Regional Meeting Fall 2024, Omaha, Nebraska, USA.
2025	Acting Chair and Chair-Elect of American Chemical Society Omaha Section.

UNIVERSITY SERVICES

2024	Postdoctoral Research Associate Search Committee Member, Nebraska Water Center, University of Nebraska – Lincoln, Nebraska, USA.
2022 – Present	Ph.D. Committee Outside Member and Reader of Carmen Perez Donado, University of Nebraska – Lincoln, Nebraska.

2023 – Present	Master’s Committee Member of Muili Lawal, University of Nebraska – Lincoln, Nebraska.
2022 – 2023	Master’s Committee Member of Jonathan Cronk, University of Nebraska – Lincoln, Nebraska.
2023	Graduate Travel Advisory Committee Faculty Member, University of Nebraska – Lincoln, Nebraska.
2023 – Present	Curriculum Committee Environmental Science Program, School of Natural Resources, University of Nebraska – Lincoln, Nebraska.
2023	MLK Week Service, University of Nebraska – Lincoln, Nebraska.
2022	Served as the Faculty Search Committee Member at the University of Nebraska-Lincoln, Nebraska.
2021	Master’s Committee Member of Kobi Benao, University of Nebraska – Lincoln, Nebraska.
2021	Served as the ‘Research Laboratory Manager’ Hiring Committee Member, IANR, the University of Nebraska-Lincoln, Nebraska.

PREVIOUS SERVICES

2017 – 2021	Committee member, Postdoctoral Association of the University of Nebraska, Nebraska.
2011 – 2023	Committee member, Democratic Research Scholar Organization (DRSO), India
2018 – 2022	Reviewer of Undergraduate Research Program (UCARE) supporting undergraduate research at the University of Nebraska.
2018	Undergraduate poster competition judge at the University of Nebraska Lincoln Spring Research Fair.
2011 – 2017	Executive Board, Research Scholars of Indian Association for the Cultivation of Science, India.

MENTORING

Graduate Students

(Total 12, graduated 3)

2021	Kobi Benao (MS, Role: Committee member)
2021 – Present	Xiaochen Dong (Ph.D., Role: Co-advisor with Dr. Daniel Snow)
2022 – Present	Britt Fossum (Ph.D., Role: Co-advisor with Dr. Michael Kaiser)

2023 – Present	Carmen E. Perez-Donodo (Ph.D., Role: Committee outside member and reader)
2022 – 2024	Yvon Ukwishaka (MS, Role: Advisor)
2023	Jonathan Cronk (MS, Role: Committee member)
2023 – Present	Muili Lawal (MS, Role: Committee member)
2023 – Present	Japhet Dushimeyesu (MS, Role: Advisor)
2023 – Present	Chandan Kumar (Ph.D., Role: Advisor)
2023 – Present	Kalley Collins (MS, Role: Co-advisor with Dr. Trenton Franz)
2024 – Present	Saurabh Sharma (Ph.D., Role: Advisor)
2024 – Present	Kaitlyn Richards (MS, Role: Advisor)

Undergraduate Students

(Total 7, graduated 6, three joined as graduate students in my group)

2021 – 2022	Yvon Ukwishaka (ARD Undergraduate Researcher)
2022 – 2023	Japhet Dushimeyesu
2022	Elysee Ndayishimiye
2022 – 2023	Joy Ishimwe
2024 – Present	Kira Hall
2023 – 2024	Kaitlyn Richards (UCARE Undergraduate Researcher and USGS Undergraduate Researcher)
2024	Saba Ghaffar

OUTREACH ACTIVITIES

2024	Presented Research Progress and Challenges to Water Quality of the State at the Water Resources Advisory Panel.
2024	Research Progress updates to Upper Big Blue Natural Resources District. NRD Board members.
2023	Provided update on carbon injection research to farmers at Creighton, NE.
2023	Invited presentation on groundwater quality at the Nebraska Corn Board, Albion, Nebraska.
2022	Water for Food from the Field, Sutherland, Nebraska.
2022	Presented research at Natural Resources Districts Manager Meeting, Nebraska.
2022	Bazile Groundwater Management Area Field Day, Creighton, Nebraska.
2018	East Campus Discovery Day, University of Nebraska – Lincoln, Nebraska.
2016	Water Quality of Your Locality, Kolkata, India.