

**SOBIA ANJUM**  
**ENVIRONMENTAL SCIENTIST**

(406) 600-4338

[SOBIAANJUM7@GMAIL.COM](mailto:SOBIAANJUM7@GMAIL.COM)

I am an interdisciplinary scientist with 10+ years of experience in water treatment and sustainable building materials projects. I have honed broad skills in biotechnology and engineering to pursue a career in environmental consulting for soil and water treatment and support the remediation of complex environmental sites. I have a demonstrated ability to support innovation, create collaborations, and communicate science across scientific and public audiences.

## EDUCATION

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Ph.D. in Engineering, Montana State University (MSU)	2023
MS Biotechnology, Forman Christian College University (FCCU)	2014
BS Honors Biotechnology, Government College University (GCU)	2012

## TRAINING AND CERTIFICATIONS

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- Continuing ASCE Water Training Certificate (Drinking, surface, and groundwater remediation design)
- ArcGIS Pro Essentials Training (2024): A case study to assess river water quality using interpolation.
- ITRC course training: Vapor Intrusion Mitigation (2024), and 1,4-Dioxane: Science, Characterization & Analysis, and Remediation (2024).

## EXPERIENCE

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*Center for Biofilm Engineering, Montana State University, Bozeman* *Dec 2023-present*  
*Postgraduate Researcher*

- Transferring skills to advance bio-nanocomposite design for building materials applications, guiding undergraduate students in the next experimental designs, data acquisition, analysis, and presentation.
- Responsible for guiding the implementation of research plans and preparing progress reports, presentations, and publications for the research projects.

*Center for Biofilm Engineering, Montana State University, Bozeman* *2015-2023*  
*Research Associate*

- Designed and optimized carbon-neutral bio-nanocomposite adhesive formulations for sustainable built environments, contributing to 500K and 4M USD grant proposals, resulting in a patent and 3 peer-reviewed manuscripts.
- Conducted statistical analyses for biochemical, mechanical testing, and imaging analysis data in R and Minitab and generated data visualization using MATLAB and Origin software. Supported collaborating groups in statistical analyses.
- Presented research outcomes to peer and non-peer groups at the Center for Biofilm Engineering, collaborative stakeholders at Montana Nanotechnology Review meeting, academic conferences, Montana Biofilm Meetings with industrial members, and the general public, winning the 3 Minute Thesis award, STEM Storytellers Fellowship, and an invited presentation at the Annual Sustainability Summit, MSU.

- Collaborated across 3 research labs, trained 2 undergraduate students (4+ years) in microbiology and environmental analysis techniques, and mentored peer and non-peer research students in STEM Storytelling and graphic design skills for grant writing and manuscripts.
- Supported communications and event organization as a Graduate Representative for the University Graduate Council, Graduate Student Ambassadors, and the Center for Biofilm Engineering seminar committee.
- Relevant coursework: Drinking Wastewater Treatment Process and Design, Water Chemistry, Environmental Engineering Reactor Theory, and Aqueous Geochemistry.
- Aqueous Geochemistry Project: Prediction of mineral precipitation potential in water samples using Visual MINTEQ.

#### *Graduate Research Student at School of Life Sciences, FCCU*

*2012-2014*

- Collaborated with environmental consultancy and industrial partners to develop a research proposal for the first water treatment project in the department, receiving 150K (PKR) in internal research funding.
- Designed and executed a pilot-scale bioattenuation project by collecting industrial effluent samples, isolating microbes, and designing co-cultures to treat combined industrial wastewaters, achieving >90% improvements in water quality and meeting the regulatory standards in COD, pH, and TSS.
- Designed and executed a biostimulation treatment with a minimal growth medium-based strategy, improving the water quality of previously 'untreatable' ink-dye wastewater samples by 30%.
- Received Fulbright Fellowship to pursue a degree in Engineering.

#### *Institute of Industrial Biotechnology, GCU*

*2011-2012*

##### *Undergraduate Researcher*

- Designed an enzyme-based treatment for tannery wastewater. Soil and water samples were collected in tannery effluent sites at 5 sites to collect 20+ bacterial isolates.
- Extracted enzymes capable of biodegradation of animal proteins from bacterial isolates, conducted enzyme assays, and optimized treatments to achieve up to 400% improvement in enzyme efficiency.
- Published a scientific paper in the International Journal of Botany.

## **AFFILIATIONS AND AWARDS**

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American Society of Civil Engineers, Society for the Advancement of Material and Process Engineering (Rocky Mountain), Society of Women Engineers.

Climate Ambassador (2024), Schultz Emerging Fellow (2020-2021), STEM Storytellers Fellow (2020), 3 Minute Thesis People's Choice (2020), and Fulbright Fellow (2015-2020).

## **SKILLS**

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- Data analysis: R, Minitab, MATLAB, ImageJ, Visual MINTEQ, Geochemists workbench, and ArcGIS Pro.
- Data visualization and presentation: Origin, Adobe Illustrator, and BioRender.
- Instrumentation: Water quality assessment (COD, BOD, TSS, pH, enzymatic, microbial, and biochemical analyses), Confocal microscopy, Electron Microscopy (FE-SEM and EDS-SEM), Raman Spectroscopy, Universal Testing System (Instron), Nanoindentation, and Thermogravimetric analysis (TGA)