Anurup Mohanty

anurupmohanty@u.northwestern.edu 0000-0001-6798-0435 linktr.ee/strayologist

Education

Sep 2023 – Present
Northwestern University, Evanston, IL, USA
Doctor of Philosophy *in Earth and Planetary Sciences*
Advisor: Prof. Dr. Magdalena Osburn

Jun 2018 – 2022
SRM Institute of Science and Technology, Chennai, TN, India
Bachelor of Technology *in Biotechnology*
Thesis: Regulation of Gene Expression in Tardigrades and its Role in Stress Tolerance

Experience

Mar – Jun 2024
Northwestern University, Evanston, IL, USA
Teaching Assistant
Advisor: Prof. Dr. Steven Jacobsen
- TAed "EARTH 101: Earth Science for the 21st Century" class.
- The role involved: Preparing quizzes and questionnaires, conducting office hours to clarify doubts, grading assignments and delivering a lecture to a class of 200+ students.

Nov 2020 – Present
Blue Marble Space Institute of Science, Seattle, WA, USA (REMOTE)
Visiting Scholar
Advisor: Dr. Graham Lau
- Exploring avenues in science communication: public speaking, popular science writing, teaching school students etc.
- Assisting with the live production of scientist interviews for NASA-funded show "Ask An Astrobiologist".

Nov 2022 – Jun '23
Indian Institute of Science, Bengaluru, KA, India
Project Assistant, Department of Mechanical Engineering
Advisor: Prof. Dr. Aloke Kumar
- Studied the effect of stresses on microbially-induced calcite precipitation in *Sporosarcina* and *Bacillus* strains.

Internships and Extracurricular Work

Jan – Oct 2022
Indian Institute of Science, Bengaluru, KA, India
Project Intern, Department of Biochemistry
Advisor: Prof. Dr. Sandeep M. Eswarappa
- Investigated the mechanisms of cryptobiosis, heat, and desiccation tolerance in tardigrades.
- Studied gene regulation and protein synthesis using molecular biology techniques.
- Attempted characterizing a UV resistant pigment found in tardigrade — *Paramacrobiotus* BLR

Aug – Oct 2021
Amity University, Mumbai, MH, India
Research Assistant, Centre of Excellence in Astrobiology
Advisors: Drs. Siddharth Pandey, Renitta Jobby, Pamela Jha
- Collected samples from Puga Valley (hot springs) and Tso Kar (hypersaline lake) during the Earth and Space Exploration Program 2021 – Ladakh, India
- Employed culture-dependent approaches for isolation and characterization of thermophiles and halophiles.

Jun – Oct 2020
Blue Marble Space Institute of Science, Seattle, WA, USA (REMOTE)
Research Associate, Young Scientist Program
Advisors: Drs. Andro C. Rios and Graham Lau
- An internship with the Center for Life Detection Science, NASA Ames Research Center.
  Project: Contributed entries to the Knowledge Base (KB) of the Life Detection Forum (LDF): Added to the repository with literature and evidence about amino acid abundance pattern as a biosignature.

Sep 2019 – Dec '21 | **SRM Institute of Science and Technology,** Chennai, TN, India
Undergraduate Researcher, Department of Biotechnology
Advisor: Prof. Dr. Lilly M Saleena
- Isolated and characterized carbonate-dissolving bacteria isolated from a magnesite mine.
- Analyzed Tardigrade-specific intrinsically disordered proteins using molecular dynamics simulations.

Jul 2018 – May '22 | **Team RUDRA - SRM Mars Rover,** Chennai, TN, India
Researcher and ***Science Lead (2021-22)***
- Developed 2 Mars analog rover payloads with the capability to detect and distinguish extinct and extant life. Competed in the University and International Rover Challenges. Scored 100/100 in Science Mission - URC 2019.

Skills

Laboratory: Microbial Culture, Microscopy, DNA/RNA/Protein Extraction, PCR, SDS-PAGE, Polysome Profiling.
Bioinformatics:
→ Metagenomics: Anvi'o v7, Megahit, Bowtie2, etc.
→ NCBI Tools and Resources (BLAST, CDTree, etc.), MEGA X - Phylogenetics
Others: Sample Collection (Field), Public Speaking, Scientific Writing, Reference Mangers, Text Editors and Literature Review.

Projects

Sep - Dec 2022 // Jun - Aug 2021 | **International Space Station - Metagenomics**
NASA Jet Propulsion Laboratory (REMOTE)
- A collaboration with Drs. Kasthuri Venkateswaran and Nitin Kumar Singh, where I:
  - Analyzed metagenomes from the surfaces inside the ISS using Anvi'o and other bioinformatics tools.
  - Explored the International Space Station microbiome to understand bacteriophage-bacteria interactions.
  - Compiled a review article summarizing bacteriophage research, its significance, and highlighting knowledge gaps.

Fellowships and Funding

- 2023: University Fellowship – Northwestern University ($111,716)
- 2021: STARS Scholarship // Team: "The Extreme Biominers" – Axiom Space ($1000)

Achievements and Awards

- AbSciCon 2022 – Creative Writing Competition – 3rd Prize (w/ Rohan Chowdhury) in Science Fiction

Publications (Peer Reviewed)

1. **Mohanty, A.**, Shaw, B., Pradeep, N., Singh, N. K., & Venkateswaran, K. (2023). Exploring the Potential of Bacteriophages on Earth and Beyond. *Journal of the Indian Institute of Science*. DOI: 10.1007/s41745-023-00361-0
2. Santomartino, R., Averesch, N. J. H., Bhuiyan, M., Cockell, C. S., Colangelo, J., Gumulya, Y., Lehner, B., Lopez-Ayala, I., McMahon, S., **Mohanty, A.**, ... & Zea, L. et al. (2023). Toward sustainable space exploration: a roadmap for harnessing the power of microorganisms. *Nature Communications*, 14(1). DOI: 10.1038/s41467-023-37070-2
3. Pandey, S., Macey, M. C., Das, D., **Mohanty, A.**, Tiwari, S., Jose, J. V., & Sharma, S. (2022). Astrobiology as a Driver to Connect India's Public, Scientists, and Space Missions. *New Space*, 10(1). DOI: 10.1089/space.2021.0041

Science Communication and Non-Peer Reviewed Work

Letter
Succinct discoveries that inspire. Science, 381,24-25(2023). DOI: 10.1126/science.adi873
Science Fiction
NASA Astrobiology: A Sky Beneath the Crust
Conference Presentations
AbSciCon22: Commencing Field Characterization Studies at Potential Mars Analogues: Puga Hot Springs and Tso Kar, Ladakh
BlueSciCon20: Biosignatures and the Life Detection Forum's Knowledge Base

Outreach/Service

Teaching Assistant: Introduction to Astrobiology (Online Course), Amity Centre of Excellence in Astrobiology.
Field Teaching Assistant: Earth and Space Exploration Program 2021 – Ladakh, India

Community Involvement

- NASA Astrobiology Science Communication Guild
- NASA RCN: Network for Life Detection // Early Career Council