

# Ankit Raj

PhD Student, Spatial Ecology & Paleontology lab  
Quantitative Biosciences, Earth & Atmospheric Sciences  
Georgia Institute of Technology, Atlanta, Georgia, USA

Contact: [ankitraj@gatech.edu](mailto:ankitraj@gatech.edu),  
GitHub: <https://github.com/ankit-raaz/>

## Education

- 2024-Present    **PhD in Quantitative Biosciences, Home school: Earth & Atmospheric Sciences**  
Georgia Institute of Technology, Atlanta, USA  
Supervisor: **Dr. Jenny McGuire**, school of Biological Sciences, and school of Earth & Atmospheric Sciences
- 2018-2023    Five-Year BS-MS Dual Degree, **Major: Geological Sciences**  
Indian Institute of Science Education & Research (IISER) Kolkata, India  
CGPA: 8.57/10; **Major CGPA: 9.17/10**  
Recipient of **the Chairman's Medal of Excellence for the best all-around performance**

## Scientific Interests

- Fire Paleoeology
- Ecometrics
- Paleoeology
- Functional Ecology
- Models of Ecological Diversification
- Conservation Paleobiology

## Research Experience

- First Year PhD Project    **Disruption in the Trait-Environment relationship in African large mammals**  
Supervisor: **Prof. Jenny McGuire**, Department of Biology and EAS, GAtech, Atlanta  
In Collaboration with **Dr. Michelle Lawning**, Department of Ecology and Conservation Biology, University of Texas A&M
- Quantified trait- environment relationship using ecometrics modelling
  - Evaluated the point connectivity using Omniscape connectivity modelling
  - Developed methods of analyzing the ecometric anomaly significance
- MS Thesis Project    **Patterns of Ecospace Utilization in Marine Invertebrates During the Mesozoic**  
2022-2023    Supervisor: **Dr. Subhronil Mondal**; Department of Earth Sciences, IISER Kolkata  
In Collaboration with **Prof. Phillip Novack Gottshall**, Department of Biological Sciences, Benedictine University, Illinois
- Quantified ecological diversity using a theoretical ecospace framework.
  - Compared patterns of ecospace occupation through time.
  - Analyzed ecospace structuring in the aftermath of extinction events.
  - Functional trait data collected from **PBDB**
- Summer 2022    **Models of Ecological Diversification**  
Mentor: **Dr. Subhronil Mondal**; Department of Earth Sciences, IISER Kolkata
- Analyzed models of ecological diversification using the **R** package Ecospace.
  - Simulated dynamics of ecological diversification with various Ecospace frameworks.
  - Tested model selection methods, including Akaike Information Criterion (AIC),

classification trees, and random forest (machine-learning-based algorithms).

### Summer 2021 **Paleoecological Diversification Metrics**

Mentor: **Dr. Subhronil Mondal**; Department of Earth Sciences, IISER Kolkata

- Studied various multidimensional Frameworks used in Paleoecology.
- Literature survey on ecological disparity and functional diversity metrics.

### Summer 2019 **Microplastics Research (Environmental Science)**

Summer 2019

Mentor: **Dr. Gopala Krishna Darbha**; Department of Earth Sciences, IISER Kolkata

- Explored techniques to detect microplastics in oceans using Fourier Transform Infrared (FTIR) Spectroscopy and Near Infrared (NIR) spectroscopy.
- Analyzed methods to develop highly concentrated suspensions of silver nanoparticles.
- Used Inductively Coupled Plasma Mass Spectrometry for elemental identification.

### 2018-2019 **Quantum Computing**

Mentor: **Prof. Prasant Panigrahi**; Department of Physics, Interim Director of IISER Kolkata

- Simulated Quantum Bomb Detection using IBM quantum computer.
- Designed a quantum circuit for the Elitzur and Elitzur-Vaidman experiment, interaction-free measurement.

## Computational Skills

**Programming Languages: R, Python: Pyrate (Bayesian Framework), MATLAB; Parallel computing, Shell scripting: Bash, Quantum Computation (IBM), Q-GIS, Origin, OS: Linux (Arch & Debian), Supercomputing (HPC) on the IISER Kolkata campus.**

## Publications & Talks

"Demonstration of Quantum bomb detection using IBM Quantum computer" **A. Raj**, B. Das, B. K. Behera, and P. K. Panigrahi; Pre-print.

"Quantum bomb detection using IBM Quantum computer." Quantum Information and Quantum Technology (QIQT) conference, IISER Kolkata, 2019.

## Conference Workshops & Additional Courses

- 2026 The International Biogeography Society Conference, Aarhus, Denmark (presented poster)
- 2025 Gordon Research Seminar and Conference, Ventura, California (presented poster)
- 2025 Paleontological Fieldwork at Natural Trap Cave (focus on mammalia), Wyoming
- 2025 Evolution Conference, Athens, Georgia
- 2025 Paleobiology Database (PBDB) Workshop, George Mason, University
- 2023 Paleontology and stratigraphy **Fieldwork**; Dwarka, Gujrat, India; Dr. Subhronil Mondal
- 2022 "**Extinctions: Past, Present, & Future**"; Coursera course; Prof. Anthony Martin, Emory University.
- 2021 "Fundamentals of Paleontology"; Kujju **Field Training** Center, Geological Survey of India Training Institute, Hyderabad.
- 2019 **Science Communication** Course; Prof. Lewis Dartnell (University of Westminster, London, UK), IISER Kolkata.

## Teaching Experience

- Fall 2025 Graduate Teaching Assistant, Intro to Environmental Sciences (3 sections 24, 18, 24 students)
- Spring 2025 Graduate Teaching Assistant, Earth Processes (19 students)
- Fall 2024 Graduate Teaching Assistant, Introduction to Environmental Science (22 students)
- 2023 Teaching Assistant, Paleontology laboratory; 3rd year course (11 Students)
- 2023 Teaching Assistant, Earth System Processes; 1st year course (50 students)
- 2022 Teaching Assistant, Earth and Planetary Sciences; 1st year course (50 students)

## Leadership skills

- 2025- present Junior Executive, Student Government Association, QBioS, Georgia Tech
- 2025- Present Instructor in Training (IIT) at Outdoor Recreation Georgia Tech (**ORGT**), Caving
- 2021-22 General Secretary, Games and Sports Student Affairs Council, IISER Kolkata  
- Two tenures, representing 1500 students.
- 2021 Fest Coordinator; Tenacity -- An all-IISER Virtual Games and Sports Fest  
- Four-day online fest (during the pandemic) conducted among ten colleges with seven events.
- 2020 Department Representative; Batch of Geological Sciences 2023, IISER Kolkata.

## Outreach Activities

- 2022 Founding Member, Earth: The **Journal Club** of Earth Sciences, IISER Kolkata.
- 2018- 2024 Member at Ek Pehal, an initiative to help educate kids in rural areas surrounding IISER Kolkata; organized multiple outreach events.
- 2022-2024 9th Indian National Exhibition cum- Fair and 25th National Science Exhibition Kolkata, India; **Member of outreach committee** of Earth Sciences (DES) IISER Kolkata