Curriculum vitae

Dr. Anurag Kumar
Scientist 'B' (2021 – Present)
Birbal Sahni Institute of Palaeosciences, Lucknow
Email: anuragkumar.geo@gmail.com
Date of Birth: 31st January 1991
Contact address: RML-135, Rangamatia, Post: Sindri, Dist: Dhanbad, State: Jharkhand, Pin: 828122
Google Scholar: https://scholar.google.com/citations?user=ZlmPswgAAAAJ&hl=en&oi=sra
Research Gate: https://www.researchgate.net/profile/Anurag-Kumar-4

Research interests:

- Stable isotope hydrology
- Biogeochemical cycle (carbon and nitrogen)
- Paleoclimatic reconstruction
- Modern isotopic calibration

Education:

2014 – 2021 Ph.D.
Thesis Title: Understanding the Hydrological, Carbon and Nitrogen cycle in the Ganga river basin: Insights from the stable isotopes
Ph.D. Supervisor: Prof Prasanta Sanyal

2009 – 2014 Integrated Master in Science (BS-MS Dual Degree Course)
Title: Characterization of paleosol at an isotopic level and its implication to past climate and vegetation: A case study from Rayka Section near Mahi River, Gujarat.

Techniques established in different institutes:

- Modified Gas bench II (Thermo) for purification and concentration of N_2O (IISER Kolkata).
- Established methodology for conversion of dissolved nitrate in water sample to N_2O for the isotopic measurement ($\delta^{15}N$ and $\delta^{18}O$) (IISER Kolkata).
- Designed and built sediment core cutting instrument (IISER Kolkata).
- Working on establishing laboratory for compound specific isotope analysis (Birbal Sahni Institute of Palaeosciences Lucknow)
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Funded Projects:

- SERB-SRG Grant 2023: The role of water isotopes in understanding the hydrological cycle and its implication to palaeoclimatic studies (INR 25 lakhs).

Instrumental skills:

- Isotope-ratio mass spectrometry (IRMS, MAT 253 and Delta V)
- Gas Bench II
- GC-MS-MS
- Kiel IV Carbonate
- Element Analyzer (Flash 2000)
- GC-C-IRMS
- Rotary Evaporator, Accelerated Solvent Extractor, Micro-Mill, Freeze dryer, Microwave extractor, spectrophotometer, Grain size analyser, thin-section preparation.

Software skill:

Ferret, Arc GIS (Basic level), R studio (Basic level), Matlab (Basic level), Sigma Plot, Corel draw, MS Excel, MS Word, MS PowerPoint, Origin (Basic level).

Invited Talk:

- Dr Anurag Kumar (Keynote speaker), Title of talk: Use of Environmental Isotopes in water resource management: Insights from the Ganga river basin. Conference: Uttar Pradesh Ground Water Conference (UPGWC-2023), Venue: Dayal Bagh resort, Shushant Golf City Amar Shaheed Path, Lucknow, Uttar Pradesh. Date: 27th February 2023.

Scientific workshops attended:

- 22nd November- 24th November 2022: International Training Course on Data Quality Assurance in Stable Isotope Laboratories at IAEA Vienna (deputed by Department of atomic energy, India).
- American Geophysical Union Meeting, 2019, Venue: San Francisco, USA, 09th to 13th December 2019. Topic: Isotopic signature of riverwater, rainwater and groundwater across the Ganga river basin.
- Japan Geoscience Union Meeting, 2019, Venue: Japan, 26th to 30th May 2019. Topic: Dynamics of carbon and nitrogen influx in large river system, Isotopic study from river Ganga India.
- Wari Fellowship at University of Nebraska-Lincoln from the date of May 15, 2017 to September 15, 2017. (United States of America, Nebraska, Lincoln). Topic: Use of isotope and isotopomers to evaluate nitrate source and fate in the vadose zone and ground water.
- Training Course on Principle and Application of Isotope Hydrology methods (10-21 Oct, 2016, Vienna, Austria).
- Training Course on Application of environmental isotopes in rivers and lakes, Vienna, Austria, (16-27 Nov, 2015).

- International Symposium on Isotope Hydrology: Revisiting Foundation and Exploring Frontiers, Vienna, Austria, 11-15 May, 2015 (CN-225). Topic: Isotopic variations ($\delta^{18}O$ and δD) in large river system and its implication to water budget: A case study from the river Ganges, India
- IISER Kolkata winter school on number theory on "Warings Problem" in December 2010 delivered by Prof. M Ram Murty.
- Undergraduate Training Program in Mathematics held in IIT Patna in May 2011.

Awards and Achievements:

S.No.	Name of Award	Awarding Agency	Year
1.	IAEA Training Grant	International Atomic Energy Agency, Vienna	2022
2.	JpGU travel grant	Japan Geophysical Union, Japan	2019
3.	AGU Student travel grant	AGU	2019
4.	CSIR international travel grant	CSIR	2019
5.	Wari Fellowship	IUSSTF / DST	2017
6.	Senior Research Fellowship	DST INSPIRE	2016
7.	IAEA Training Grant	International Atomic Energy Agency, Vienna	2016
8.	IAEA Training Grant	International Atomic Energy Agency, Vienna	2016
9.	IAEA Conference Grant	International Atomic Energy Agency, Vienna	2015
10.	Junior Research Fellowship	DST INSPIRE	2014
11.	Inspire Fellowship (for BS-MS)	DST INSPIRE	2009

Teaching responsibilities:

2023-2024 AcSIR-64-ID-005: Biogeochemistry (Redox chemistry)
Birbal Sahni Institute of Palaeosciences, Lucknow

2022-2023 AcSIR-64-ID-005: Biogeochemistry (Basic forces within ocean and atmosphere and Redox chemistry)
Birbal Sahni Institute of Palaeosciences, Lucknow

2022-2023 AcSIR-64-ID-course 1a: Research Methodology (Shared responsibility and team-spirit among fellow researchers and advancing culture of scientific sharing and discussion in campus and lab.)
Birbal Sahni Institute of Palaeosciences, Lucknow

2021-2022 AcSIR-64-ID-P3.1 Inorganic Geochemistry (Composition of earth crust, ocean water, volcanic emissions)
Birbal Sahni Institute of Palaeosciences, Lucknow

2021-2022 AcSIR-64-ID-004 Hydrological cycle and Hydrosphere
Birbal Sahni Institute of Palaeosciences, Lucknow

2017-2018 Teaching Assistant in the course "Hydrology and Geodynamics (ES2102)" Department of Earth Sciences, IISER Kolkata (Autumn semester).
Course taken by Dr. Manoj Kumar Jaiswal and Dr. Prasanta Sanyal

2016-2017 Teaching Assistant in the course "Hydrology and Geodynamics" Department of Earth Sciences, IISER Kolkata (Autumn semester).
Course taken by Dr. Manoj Kumar Jaiswal and Dr. Prasanta Sanyal

Geological fieldwork experiences:

- Field work to collect lake core from Kawar Lake Begusarai, Bihar (26th April 2022- 11th May 2022).
- Field work to collect tree ring samples for isotope analysis in Gorakhpur forest, Uttar Pradesh (15th November 2021- 24th November 2021).
- Field work in Ganga river Basin to collect river water, ground water, suspended sediments and bedload sediments (24th May-19th June, 2016) (26th Sept-17th Oct, 2015).
- Field work in Ahmadabad (Gujrat) for understanding the Quaternary deposits (5th year BS-MS dissertation project).
- Field work in Kanpur (India), for drilling 14 core on the bank of different rivers to understand the evolution of Ganga river basin (funded by IISER Kolkata).
- Structural Geology field work at Galudih and Ghatsila to map the local geological features and understand the regional geology (Course Supervisor: Dr. Kathakali Bhattachayya and Dr Ravikant vadlamani)
- Field Work in Sikkim (Northern Himalaya) to understand the role of width of original sedimentary basin in partitioning shortening in the Himalayan fold- thrust belt. (Sampling and study of regional Geology). Supervisor: Dr. Kathakali Bhattacharyya
- Field work in Ahmadabad to understand the fluvial system of the region (Supervisor: Dr. Prasanta Sanyal, Dr Melinda Kumar Bera).
- Field work in Chandipur to understand the marine system (Supervisor: Dr Melinda Kumar Bera and Dr. Devapriya Chattopadhyay).

Publications: Citation = 76, h-index = 4, i10-index = 2

S.No.	Author(s)	Title	Name of Journal	Volume	Page	Year
1	Anurag Kumar*, Prasanta Sanyal, and Shailesh Agrawal	Spatial distribution of $\delta^{18}O$ values of water in the Ganga River Basin: Insight into the hydrological processes	Journal of Hydrology (**Impact Factor: 6.4**)	571	225-234	2019
2	Vijayananda Sarangi*, Anurag Kumar, Prasanta Sanyal	Effect of pedogenesis on the stable isotopic composition of calcretes and n-alkanes: Implications for paleoenvironmental reconstruction	Sedimentology (**Impact Factor: 3.5**)	66	1560-1579	2019

S.No.	Author(s)	Title	Name of Journal	Volume	Page	Year
3	Bibhasvata Dasgupta, Ajay Ajay, Anurag Kumar, Meloth Thamban, Prasanta Sanyal	Isoscape of surface runoff in high mountain catchments: An alternate model for meteoric water characterization and its implications.	Journal of Geophysical Research: Atmospheres (**Impact Factor: 4.4**)	126	033950	2021
4.	Anurag Kumar, A Ajay, Bibhas Dasgupta, Punyasloke Bhadury, Prasanta Sanyal	Deciphering the nitrate sources and processes in the Ganga river using dual isotopes of nitrate and Bayesian mixing model	Environmental Research (**Impact Factor: 8.3**)	216	114744	2023

Research Experiences:

I use stable isotope as tool to understand the present and past climatic conditions. I have worked on reconstruction of palaeoclimate using stable isotopes (Compound specific isotope analysis in Alkanes). Currently, I am also immersed in the field of isotope dendrochronology, with a focus on utilizing tree rings to reconstruct climatic records spanning the past two centuries. I also have expertise in working with stable isotopes of water, dissolved inorganic carbon and dissolved nitrate.

- Scientist B (2021 – Present): Using stable isotopes
    a) To reconstruct palaeoclimate from the lake core sediments of core monsoon zone in India (Bulk and compound specific isotope).
    b) To reconstruct past climatic record using stable isotopes of tree ring (isotope dendrochronology)
    c) Mapping the spatial distribution of water in Ganga river basin.
- Ph.D. dissertation work 2014-2021: Use of elements and isotope to understand a large river system: A case study in the river Ganga, India
    a) **Guide:** Dr. Prasanta Sanyal
- Research internship in 2017: Use of isotope and isotopomers to evaluate nitrate source and fate in the vadose zone and ground water
    a) **Guide:** Prof. Daniel D. Snow, University of Nebraska Lincoln, USA
- Dissertation work in 2014: Characterization of paleosol at isotopic level and its implication to past climate and vegetation: A case study from Rayka section near Mahi River, Gujarat.
    a) **Guide:** Dr. Prasanta Sanyal, (IISER Kolkata).
- Summer Project in 2013: Extracting cellulose from tree ring samples and their stable isotope analysis for paleoclimatic reconstruction.
    a) **Guide:** Dr. Saikat Sengupta, (IITM Pune).
- Summer Project in 2012: Role of width of original sedimentary basin in partitioning shortening in the Himalayan fold- thrust belt.
    a) **Guide:** Dr. Kathakali Bhattacharyya, (IISER Kolkata).

Languages:

- English (Fluent), Hindi (Native language), Bengali (Intermediate level)

Last updated on: 27th September 2023