

# Sourav Kumar, PhD

Postdoctoral Fellow, Department of Earth Sciences, Stellenbosch University, Stellenbosch 7599, Western Cape, South Africa

+91-9897492831 • souravkumariitg@gmail.com • [Webpage](#) • Stellenbosch, SA • 22 Nov 1996

## ACADEMIC AND RESEARCH EXPERIENCE

|                                                                                    |                                                                                                                                                                                                                                                                                    |                                         |
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|    | <b>Postdoctoral Fellow</b><br>Department of Earth Sciences, Stellenbosch University, South Africa                                                                                                                                                                                  | Stellenbosch, SA<br>July 2026 - Present |
|    | <b>Institute Postdoctoral Fellow (IPDF)</b><br>Department of Civil Engineering, Indian Institute of Technology Kharagpur, India                                                                                                                                                    | Kharagpur, IN<br>Apr 2026 - Jun 2026    |
|    | <b>Senior Research Fellow (SRF-Extended)</b><br>Centre for Sustainable Water Research, Indian Institute of Technology Guwahati, India                                                                                                                                              | Guwahati, IN<br>Sep 2025 - Mar 2026     |
|    | <b>Visiting Student Researcher</b><br>Department of Earth and Planetary Science, University of California Berkeley, USA                                                                                                                                                            | Berkeley, US<br>Sep 2022 - May 2023     |
|    | <b>Doctor of Philosophy (Ph.D.)</b><br>Earth System Science and Engineering Division, Department of Civil Engineering, Indian Institute of Technology Guwahati, India                                                                                                              | Guwahati, IN<br>Jul 2019 - Feb 2026     |
|    | <b>Master of Technology (M.Tech.)</b><br>Earth System Science and Engineering Division, Department of Civil Engineering, Indian Institute of Technology Guwahati, India<br>• Key Courses: <i>Earth System Dynamics, Geohazard Science and Engineering, Advanced Remote Sensing</i> | Guwahati, IN<br>Jul 2016 - Oct 2018     |
|  | <b>Bachelor of Technology (B.Tech.)</b><br>Department of Civil Engineering, Uttaranchal University, Dehradun, India<br>• Key Courses: <i>Hydrology, Environmental Engineering, Seismology and Earthquake Engineering, Groundwater Engineering</i>                                  | Dehradun, IN<br>Jul 2012 - Jul 2016     |

## FELLOWSHIPS, AWARDS, AND HONORS

|                                                                                    |                                                                                                                                                                                                        |                                                                                    |                                                                                                                                                               |                                                                                    |                                                                                                                                                        |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>2022-23 Fulbright-Nehru Doctoral Research Fellowship</b><br>Conducted research as a Visiting Student Researcher at the Department of Earth and Planetary Science, UC Berkeley (Sep 2022 - May 2023) |  | <b>Guest Speaker – Institute for Geophysics and Planetary Physics (IGPP) Seminar Series</b><br>Department of Earth and Planetary Science, UC Santa Cruz, 2023 |  | <b>Selected Participant – Fulbright Enrichment Seminar</b><br>Organized by the Institute of International Education (IIE) at Washington, DC, USA, 2023 |
|  | <b>Invited Research Participant – Brahmaputra River Expedition, Ministry of Jal Shakti (GoI), 2021</b><br>Invited to join a national scientific and outreach expedition on the Brahmaputra River.      |  | <b>Ministry of Human Resources Development (MHRD) Fellowship</b><br>For pursuing M.Tech. (2016-18) and Ph.D. (2019-24) at IIT Guwahati                        |  | <b>98.10 Percentile in 119873 Candidates</b><br>Graduate Aptitude Test in Engineering (GATE) 2016                                                      |

## RESEARCH INTERESTS

Groundwater Systems and Aquifer Dynamics | Earthquake Hydrology and Fault-Zone Hydrogeology | Groundwater–Surface Water Interactions | Hydrogeochemistry, Isotope Hydrology, and Environmental Tracers | Groundwater Storage, Recharge, and Flow Systems | Climate Variability, Hydroclimatic Extremes, and Groundwater Resilience | Basin-Scale Hydrology and Hydrochemical Organization | Long-Term Environmental Monitoring and Observational Hydrology

## ACADEMIC PROJECTS

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| <b>Ph.D. Project</b>                                                                                                                            | 2019 - 2025 |
| <b>Title:</b> <i>Basin-Scale Hydrogeochemistry and Earthquake-Induced Aquifer Modifications in the Brahmaputra River Basin, Northeast India</i> |             |
| • Supervisor: Late Prof. Chandan Mahanta and Dr. Archana M Nair                                                                                 |             |

## ACADEMIC PROJECTS

### M.Tech. Project

2017 - 2018

**Title:** A Study on the Spatio-Temporal Changes in Groundwater Storage for India Using GRACE Satellite Data

- Supervisor: Dr. Archana M Nair

## SPONSORED/COLLABORATIVE REASEARCH PROJECTS

Physical and Mathematical River Modeling Study for Brahmani River Delta Rejuvenation

Sep 2025 - Mar 2026

*Under MoU between IIT Guwahati and the Water Resources Department, Government of Odisha, India*

**Role:** Contributing to flume-based modeling of bifurcation hydraulics and sediment dynamics, and preparing the project's scientific report

Study of Glacial Dynamics and Sustainable Hydrological Resources in Arunachal Himalaya

2022

*Funded by the Department of Science & Technology, Ministry of Science and Technology, Government of India*

**Role:** Led a basin-scale hydrogeochemical and isotopic investigation of the Brahmaputra River Basin, Northeast India

## TRAININGS AND WORKSHOPS

|                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                            |
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|  Online Workshop on "Climate Change: Economics, Politics, and Global Governance"<br>02/2026<br>Organized by Centre for Educational Technology, IIT Guwahati |  Scientific Writing and Publishing Workshop<br>08/2024<br>Research Conclave 2024, IIT Guwahati                                                         |  Workplace Safety (Online Training)<br>05/2023<br>University of California Berkeley, USA                                                                                                |
|  EHS 101: UC Fundamentals of Laboratory Safety (Online Training)<br>10/2022<br>University of California Berkeley, USA                                       |  Workshop on "Acting East: Water and linked Livelihoods- Learning from the Mekong Region"<br>08/2019<br>Organized by IIT Guwahati and Asian Confluence |  Workshop on "Seeking Sustainable Solution to Water & State Specific Action Plan for Water Sector of Assam"<br>07/2019<br>Organized by IIT Guwahati and The Ministry of Jal Shakti, GOI |

## PUBLICATIONS AND CONFERENCES\*

|                                                                                                                                                                                                                                                                                                                                    |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Basin-Scale Organization of GW and SW Under Monsoonal Forcing: Hydrochemical and Isotopic Insights from the Brahmaputra River Basin, Northeast India<br>Sourav Kumar, Madhusmita Nanda, Abhishek Dixit, Archana M Nair, Michael Manga<br><i>Journal of Hydrology: Regional Studies</i><br><a href="#">Under Review</a>             | 2026 |
| Water Geochemistry and Stable Isotope Changes Record Groundwater Mixing After a Regional Earthquake in Northeast India<br>Sourav Kumar, Michael Manga, Archana M Nair, Abhishek Dixit, Chandan Mahanta<br><i>Geochemistry, Geophysics, Geosystems</i><br><a href="#">Access Here</a>                                               | 2024 |
| A Climate Zone Perspective on Spatiotemporal Variations in GRACE Derived Groundwater Storage (GWS) in India<br>Sourav Kumar, Ande Bhuvaneswari Devi, Dhritilekha Deka, Archana M Nair<br><i>Journal of the Indian Society of Remote Sensing</i><br><a href="#">Access Here</a>                                                     | 2022 |
| Mineralogical and Elemental Composition in Sediments of Upper Siang River Basin, Northeastern India<br>Abhishek Dixit, Sandip Sampat Sathe, Chandan Mahanta, Sourav Kumar, Sumantra Chaudhuri<br><i>Arsenic in the Environment: Bridging Science to Practice for Sustainable Development As2021</i><br><a href="#">Access Here</a> | 2023 |

PUBLICATIONS AND CONFERENCES\*

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Hydrogeochemical Assessment of the Water Resources in the Brahmaputra River Basin, Northeast India*                                                               | 2024 |
| Sourav Kumar, Michael Manga, Abhishek Dixit, Madhusmita Nanda, Suresh A. Kartha and Archana M Nair<br><i>AGU Fall Meeting 2024</i><br><a href="#">Access Here</a> |      |
| Hydrogeochemical Changes in Response to Multiple Earthquakes in Northeast India*                                                                                  | 2021 |
| Sourav Kumar, Abhishek Dixit, Archana M Nair, Chandan Mahanta, Ananya Bardhan<br><i>AGU Fall Meeting 2021</i><br><a href="#">Access Here</a>                      |      |
| Application of Grain-Size End-Member Modelling in Bed Sediments of the Brahmaputra River*                                                                         | 2021 |
| Abhishek Dixit, Sourav Kumar, Chandan Mahanta, Sumantra Chaudhari, Manish Singh Rana<br><i>AGU Fall Meeting 2021</i><br><a href="#">Access Here</a>               |      |
| A Study on Spatio-Temporal Variability in Groundwater Storage of India Using GRACE Data*                                                                          | 2019 |
| Ande Bhuvaneswari Devi, Sourav Kumar, Archana M Nair<br><i>AGU Fall Meeting 2019</i><br><a href="#">Access Here</a>                                               |      |

KEY RESEARCH CONTRIBUTION

|                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| Lead investigator and curator of a four-year biweekly groundwater-monitoring program (2021–2024) in the Kopili Fault Zone, generating >700 samples of major ions and stable isotopes ( $\delta^2\text{H}$ , $\delta^{18}\text{O}$ )—the first long-duration, high-resolution hydrogeochemical dataset from an active Indian fault system. | — The time series captured pronounced post-seismic chemical and isotopic excursions following the 2021 Mw 6.4 Assam earthquake, providing direct evidence of transient permeability enhancement and fluid exchange in fractured aquifers. This work, published in <i>Geochemistry, Geophysics, Geosystems</i> (2024), demonstrates the diagnostic value of fluids as tracers of stress-induced crustal processes and their implications for earthquake-precursor research. |
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TECHNICAL AND ANALYTICAL COMPETENCIES

|                                                                                                                                                          |                                                                                               |                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| <b>Analytical Instrumentation</b><br>IC, ICP-OES, MP-AES, AAS, TIC, IRMS for $\delta^2\text{H}$ / $\delta^{18}\text{O}$ , in situ hydrochemical analyses | <b>Geochemical Modeling and Data Visualization</b><br>PHREEQC, Aqion, OriginPro, Grapher      | <b>Statistics &amp; Computing</b><br>R, SPSS, MATLAB, Multivariate Statistics, Trend Analysis & Change Detection |
| <b>Remote Sensing and Geospatial Analysis</b><br>ArcGIS, QGIS, Google Earth Engine                                                                       | <b>Hydrological Datasets and Large-Scale Modeling</b><br>GRACE/GRACE-FO, GLDAS, Water Balance | <b>Hydroclimatic Analysis</b><br>Hydrological Extremes, Irrigation and Land Use Impacts, GW-SW Dynamics          |

TEACHING EXPERIENCE

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|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Teaching Assistant — Department of Civil Engineering, Indian Institute of Technology Guwahati (2016 - 2018; 2019 - 2024)                |                                                                                                                                     |
| Assisted in Courses: Geohazard Science and Engineering, Earth System Dynamics, Engineering Geology, Engineering Drawing, and Surveying. | — Responsibilities included conducting tutorials, grading assignments/exams, and providing support to students during lab sessions. |

EXTRA CURRICULAR

|                                                                                                                                                                                                                                                                                                                                                                                                  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Academic                                                                                                                                                                                                                                                                                                                                                                                         |  |
| <ul style="list-style-type: none"><li>Led a 16-day field campaign for water sampling in the eastern Himalayas under a project funded by the Department of Science and Technology, Government of India, 2022</li><li>Participated in a round table conference on “Managing Flood, Inundation and Erosion in Brahmaputra and Barak Basins in Assam: Seeking Sustainable Solutions,” 2019</li></ul> |  |

## EXTRA CURRICULAR

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### Sports

- Gold Medalist, B-Division Cricket League 2025, organized by Guwahati Sports Association, Guwahati, Assam, India
- Participant, Assam Premier Club Cricket Championship 2024, organized by Assam Cricket Association, Guwahati, Assam, India
- Gold Medalist, National College Cricket Championship 2023, organized by National College Cricket Association (NCCA), Houston, Texas, USA
- Represented Spartan Cricket Club, San Jose, California, in Winter White Ball League 2022, organized by Northern California Cricket Association (NCCA), California, USA
- Silver Medalist, Regional College Cricket Championship 2022, organized by National College Cricket Association (NCCA), Los Angeles, USA
- Gold Medalist, Rajwada Cricket League 2019, Kota, India
- 4th Place, Cricket, All India Inter-IIT Sports Meet 2019, hosted by IIT Kharagpur, West Bengal, India

### Welfare

- Member, Anti-ragging Committee, Lohit Hostel, IIT Guwahati, 2017
- Managed a hostel-level COVID-19 quarantine center during the pandemic, overseeing logistics, safety protocols, and student welfare, 2021

## POSITION OF RESPONSIBILITY

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### Captain

Cricket Team, Indian Institute of Technology Guwahati

2017-21; 2024-25



### Welfare Secretary

Lohit Hostel, Indian Institute of Technology Guwahati

2021 - 2022



### General Secretary (In-charge)

Sports Board, Indian Institute of Technology Guwahati

2021



### General Secretary

Lohit Hostel, Indian Institute of Technology Guwahati

2017 - 2018

## REFERENCES

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### Dr. Archana M Nair

Associate Professor

M-005, Department of Civil Engineering

Indian Institute of Technology Guwahati, Guwahati-781039, Assam, India

**Email:** [nair.archana@iitg.ac.in](mailto:nair.archana@iitg.ac.in)

**Phone:** +91-361-258-3338

### Dr. Michael Manga

Professor

381, McCone Hall

Department of Earth and Planetary Science

University of California Berkeley, Berkeley-94720-4767, California, USA

**Email:** [mmanga@berkeley.edu](mailto:mmanga@berkeley.edu)

**Phone:** +1-510-643-8532

### Dr. Rajib Maity

Professor

C-314, Department of Civil Engineering

Indian Institute of Technology Kharagpur, Kharagpur-721302, West Bengal, India

**Email:** [rajib@civil.iitkgp.ac.in](mailto:rajib@civil.iitkgp.ac.in)

**Phone:** +91-3222-283442

## FIND ME ONLINE

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