

**Biswajit Roy, PhD**  
**DST-INSPIRE Faculty**  
**National Centre for Polar and Arctic Research**  
**Vasco-Da-Gama, Goa, India**



#### ACADEMICS:

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- DST-INSPIRE Faculty at NCPOR Goa (Feb 2023- Present)
- Early Career Fellow at Indian Institute of Technology Gandhinagar (September 2021-Feb 2023)
- Visiting Scientist at Department of Geosciences, Christian-Albrecht University of Kiel (October-December, 2022)
- Research Assistant at Indian Institute of Science Education and Research Kolkata (January 2021-August 2021).
- Research Scholar at Indian Institute of Science Education and Research Kolkata (2015-2020).
- *PhD Thesis: Late Miocene-Pleistocene vegetation composition and environmental conditions of overfilled deposits in the Himalayan Foreland Basin*
- M. Sc (Geological Sciences) from Indian Institute of Science Education and Research Kolkata (2013-2016) in MS-PhD programme.
- *M.Sc Thesis: Geochemical study of paleosols to understand the evolution of the Himalayan Foreland Basin: a case study from Nurpur, Himachal Pradesh*
- B.Sc. (Geology Hons.) from Durgapur Government College, Burdwan University (2010-2013)

#### AREA OF INTEREST:

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- Organic geochemistry, Stable isotope geochemistry, Non-isotopic biomarkers,
- Pedology, Fluvial sedimentology, Sedimentary basin analysis, Petrography, Sequence stratigraphy, Paleo climate and environment reconstructions.
- Trace and major element geochemistry.

#### RESEARCH INTERESTS:

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- Reduce uncertainties in the carbon biogeochemical cycle, ecology, and hydrology.
- Determining the processes of organic carbon retentions in different terrestrial ecosystems
- Variation in response of the vegetation to diurnal, annual and decadal change in environmental conditions.
- Understanding the depositional conditions through biogeochemical proxies.
- Climate-Tectonic relationship in relationship to ecological evolution.
- Tracing the possible impact of climate change on the human dispersals and innovations.

## **RESEARCH EXPERIENCE:**

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- Expertise in handling and smooth functioning of instruments such as Dionex ASE, MARS 6, GC-MS-MS, IRMS, and its peripherals, HPLC-MS, ICP-MS, XRF, XRD, Grain size analyzer, SEM-EDX,.
- Technical-establishment of the experimental protocol for the compound-specific study of n-alkane, n-alcohols, and n-alkanoic acids, bulk organic matter and carbonates.
- Use of micro mills for accurate and fine-scale sampling of carbonate samples
- Developed several laboratory standards including FAME mixtures internal standard used for fatty acids identifications.
- Technical-establishment of the instrumental protocol for the specific non-isotopic biomarker study in terrestrial and marine sediments.
- Expertise in working in a clean laboratory, column chemistry, wet chemistry sediment sample preparation for ICP-MS and radiogenic isotopes
- Expertise in separation of single species for clay mineralogy and its experimental approaches to find the paleoclimate signals.
- Extraction of lipid from paleosols/soils/plants.
- Establishment of laboratory protocol to extract water from soil, root stem and leaves using cryogenic methods.
- Phytolith separation from modern plants and paleosols.
- Sampling, mapping, and measurement of stratigraphic sections
- Engaged in rigorous field works to investigate rocks and rock materials in their natural environment and their sampling.
- Rigorous knowledge in the sedimentary field mostly encompassing soils or the paleosols.
- Well expertise in petrographic analysis of sedimentary rocks.

## **PAST ACADEMIC POSITIONS:**

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- Senior Research Staff at IIT Gandhingar (September, 2021-February 2023)
- Visiting Scientist at CAU Kiel (October-December, 2022)
- Research Assistant at IISER Kolkata (January, 2021-August, 2021)
- Integrated MS-PhD Student at IISER Kolkata (2013-2020)

## **AWARDS AND HONOURS:**

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- Awarded DST-INSPIRE faculty fellowship 2021 for five years, with a research grant of 44000 \$ for five years.
- Awarded research project for Indian Arctic Expedition-2023 from Ministry of Earth Sciences, India.
- Awarded International Visiting fellow award from Kiel University Germany (Oct-Dec, 2022)
- Awarded prestigious Early Career Fellowship from IIT Gandhinagar with fellowship of 38336 \$ for two years.

- Awarded support of 1000 \$ to attend GSA, 2021 at Portland, USA
- Best poster award in DES annual Day, 2020, IISER Kolkata.
- Awarded full support (SRSP 600€) to attend the 36<sup>th</sup> *International Geological Congress 2020* at New Delhi, India.
- Awarded full support (2400€) for presenting a talk in *International Union for Quaternary Research 2019 (INQUA)* (Funded by INQUA) at Dublin, Ireland.
- Awarded travel support (100000 Yen) for presenting a talk in *Japan Geoscience Union 2019* at Chiba, Japan.
- Awarded full support (200000 Yen) for presenting a talk in *European Geosciences Union 2019* (Funded by JpGU) at Vienna, Austria.
- Awarded travel grant (100000 Yen) for Poster presenting in *Japan Geoscience Union 2018* at Chiba, Japan
- Awarded travel grant for presentation in Solapur University (Maharashtra, India) for *MAGIA-2018* (Govt. of Maharashtra, India).
- Awarded travel grant for presentation in *Himalaya-Karakoram-Tibet* workshop, 2015, Dehradun, India.

#### LIST OF PUBLICATION AND SUBMISSIONS:

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1. **Roy, B.,** Ghosh, S. and Sanyal, P., 2020. Morpho-tectonic control on the distribution of C3-C4 plants in the central Himalayan Siwaliks during Late Plio-Pleistocene. *Earth and Planetary Science Letters*, 535, p.116119.
2. **Roy, B.,** Ghosh, S. and Sanyal, P., 2020. Impact of monsoon, vegetation, and landscape on pedogenesis: A case study using organic and inorganic tracers from the Himalayan foreland sediments. *Palaeogeography, Palaeoclimatology, Palaeoecology*, p.109854.
3. **Roy, B.,** Patra, S. and Sanyal, P., 2020. The carbon isotopic composition of occluded carbon in phytoliths: A comparative study of phytolith extraction methods. *Review of Palaeobotany and Palynology*, 281, p.104280.
4. **Roy, B.,** Roy, S., Goyal, K., Ghosh, S. and Sanyal, P., 2021. Biomarker and carbon isotopic evidence of marine incursions in the Himalayan Foreland Basin during its overfilled stage. *Paleoceanography and Paleoclimatology*, p.e2020PA004083.
5. Ghosh, S., Bera, M.K., **Roy, B.,** and Sanyal, P., 2021 Revisiting the diachronous transition of C<sub>3</sub> to C<sub>4</sub> plants in the Himalayan foreland and other parts of the globe: A sedimentological perspective, *Sedimentology*.68, p. 2473-2499
6. **Roy, B.,** and Sanyal, P., 2022, Isotopic and molecular distribution of leaf-wax in plant-soil system of the Gangetic floodplain and its implication for paleorecords (*Quaternary International*, 607, pp.89-99).
7. Mukhopadhyay, S., **Roy, B.,** Sangode, S.J., Jaiswal, M.K. and Dutta, S., 2023. Late Quaternary sediments from Barakar-Damodar Basin, Eastern India include the 74 ka Toba ash and a 17 ka microlith toolkit. *Journal of Asian Earth Sciences*:X, p.100135.
8. **Roy, B.,** Bhaidya, D., Jain, V., Hydrogeomorphic response of charcoals during river transits and its impact on the carbon cycle (*Revision submitted to JGR: Earth Surface*)

9. Ghosh, S., Roy, B., and Sanyal, P., The Late Neogene distribution of C<sub>3</sub>-C<sub>4</sub> plants in the Himalayan foreland basin: Insight from the  $\delta^{13}\text{C}$  values and sedimentological architecture of the Siwaliks (*Revision submitted in Paleoceanography and Paleoclimatology*)
10. Ghosh, S., Roy, B., Bera, M.K., and Sanyal, P., Tectonically modulated lateral growth of the Himalaya during the Middle Miocene (*Manuscript under revision for EPSL*).
11. Roy, B., Kanva, G. and Sanyal, P., Impact of local and regional geomorphic factors on the fate of organic matter distribution in a tropical plant-soil system (*Manuscript under preparation for Geochimica et Cosmochimica Acta*).
12. Roy, B., Baidya, D., Mandal, A., and Sanyal, P., Organic matter distribution from the biomass to the soil in grassland, forest and mixed ecosystem (*Manuscript under preparation for Organic Geochemistry*).
13. Roy, B., Kharpuoli, T., Baidya, D., and Sanyal, P., Is the distribution of lipid biomolecules among different particle-size fractions stable across different terrestrial ecosystem? (*Manuscript under preparation for Organic Geochemistry*).

#### **ABSTRACT PUBLISHED:**

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1. Organic matter control on remobilization of the element in paleosol profile, Siwalik NW Himalaya, in HKT Abstract 2015, Dehradun.
2. Role of tectonics on the abundance of C<sub>3</sub>-C<sub>4</sub> plants: Evidence from the Mio-Pliocene Siwalik deposits of Central Himalaya” in Abstract HKT 2018.
3. Insight into the pedogenesis of Siwalik sediments in the Himalayan foreland basin: the role of monsoon, vegetation and basin stability” in AMESS 2017, IISER Kolkata
4. Morpho-tectonic control on the distribution of C<sub>3</sub>-C<sub>4</sub> plants in the central Siwaliks during Late Plio-Pleistocene” in JpGU 2018, Japan.
5. Understanding present geomorphic and pedogenic forcing on the organic matter distribution from vegetation to soil and its use in paleovegetation reconstruction” in EGU 2019, Austria.
6. Geomorphic and pedogenic forcing on the organic matter distribution from vegetation to soil: a concern for paleoenvironment studies in JpGU 2019, Japan.
7. Difference in adaptation rates among plants with C<sub>3</sub> and C<sub>4</sub> photosynthetic mechanism in AGU 2019, USA
8. Morpho-tectonic control on the distribution of C<sub>3</sub>-C<sub>4</sub> plants in the central Himalayan Siwaliks during Late Plio-Pleistocene, EGU virtual 2020
9. Exploring the use of Biomarkers to understand the paradox of the depository settings in Eastern Siwaliks of Himalayan foreland Basin, Goldschmidt virtual 2020.
10. Reconciling marine influences in the Eastern Siwaliks through the use of biomarkers and reconstructing the Miocene-Pliocene closure of Himalayan Foreland Basin, JpGU-AGU virtual 2020.
11. Distribution and stability of n-alkyl biomolecules across particle-size fractions of different terrestrial ecosystems, AGU virtual 2021.

#### **PROJECTS:**

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- *Role of algal communities in the context of future climate change as seen through their contribution in geological record*, NCPOR Goa (Feb, 2023- present)
- *Fate and transient storage of organic carbon in the floodplains of Indo-Gangetic Basin: a potential source to sink of global carbon influxes*, IIT Gandhinagar (Sep, 2021-Feb, 2023).
- *Distribution of microbial biomolecules across climatic and rainfall transects of Himalaya*, University of Kiel (October-December, 2022)
- *Petro-textural attributes of different Sandstone through age and its implication as a reservoir rock* with Dr. S. K. Ghosh (Scientist 'G') Wadia Institute of Himalayan Geology, Dehradun, May-July, 2014.
- *Grain Size analysis in and around New Digha Beach* with Dr. Melinda Kr. Bera, (IIT Kharagpur) November-December, 2013.

#### **POSTER PRESENTED:**

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- Distribution and stability of n-alkyl biomolecules across particle-size fractions of different terrestrial ecosystems. *AGU virtual 2021*
- Change in morpho-tectonic conditions in Late Plio-Pleistocene alluvial fans and its role in vegetation distribution. *DES Day 2020*, IISER Kolkata, India
- Understanding geomorphic and pedogenic forcing on the organic matter distribution from vegetation to soil and its use in paleovegetation reconstruction” in *INQUA 2019*, Ireland.
- Role of tectonics on the abundance of C<sub>3</sub>-C<sub>4</sub> plants: Evidence from the Mio-Pliocene Siwalik deposits of Central Himalaya” in *Himalaya-Karakoram-Tibet 2018*, Switzerland.
- Morpho-tectonic control on the distribution of C<sub>3</sub>-C<sub>4</sub> plants in the central Himalayan Siwaliks during Late Plio-Pleistocene in JpGU 2018, Japan.
- Insight into the pedogenesis of Siwalik sediments in the Himalayan foreland basin: the role of monsoon, vegetation and basin stability” in AMESS 2017, IISER Kolkata
- Organic matter control on remobilisation of the element in paleosol profile, Siwalik NW Himalaya, in HKT 2015, Dehradun.
- Paleosols used as a tool to interpret past fluvial condition, Siwalik NW Himalaya" in IISER Kolkata, March 2015.
- “Extraction of Phytolith- a Proxy for Paleo grassland Reconstruction” in IISER Kolkata, March 2014.

#### **TALK PRESENTED:**

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- Biomolecular and Sedimentological attributes revealed a new look of the late Miocene Himalayan Foreland Basin, Departmental Seminar, IIT Gandhinagar, 2021
- Biomolecular and Sedimentological attributes revealed a new look of the late Miocene Himalayan Foreland Basin, Departmental Seminar, IIT Roorkee, 2021
- Understanding present geomorphic and pedogenic forcing on the organic matter distribution from vegetation to soil and its use in paleovegetation reconstruction in EGU 2019, Vienna.
- Geomorphic and pedogenic forcing on the organic matter distribution from vegetation to soil: a concern for paleoenvironment studies in JpGU 2019, Japan.

- Geomorphic and pedogenic forcing on the organic matter distribution from vegetation to soil in MAGIA 2018, Solapur University, Maharashtra, India
- Understanding pedogenesis through organic and inorganic proxies preserved in paleosols , GIAN course, IIT Kanpur, India

#### **TEACHING EXPERIENCE:**

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- Associated with the Sedimentology theory course of undergraduate BS-MS programme as a Teaching assistant from 2015-2020.
- Associated with the Sedimentology practical course of undergraduate BS-MS programme as a Teaching assistant from 2015-2020.
- Assisted several batches of undergraduate students in Sedimentological fieldwork from 2015-2020.
- Associated with the Isotope geology theory course of undergraduate BS-MS programme as a Teaching assistant from 2015-2020.

#### **MENTORING EXPERIENCE:**

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- Mentored eight students in their summer projects students belonging to IISER Kolkata and other renowned Indian universities since 2016.
- Mentored four students in their master thesis dissertation work and all students are successfully carrying out research work in well-recognised universities.
- Mentoring two undergraduate students in their project works.
- Mentoring one PhD student at IIT Gandhinagar.

#### **ASSOCIATED SOCIETES:**

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Japan Geoscience Union (JpGU)  
 European Geosciences Union (EGU)  
 American Geophysical Union (AGU)  
 International Union for Quaternary Research (INQUA)  
 International Union of Geological Sciences (IUGS)  
 Past Global Changes (PAGES)  
 ISOGEOCHEM

#### **EXTRACIRICULAR ACTIVITIES:**

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- Elected as a mentor for Mind Care and Wellness Centre at IISER Kolkata.
- Represented the Department of Earth Science, IISER Kolkata in National Science exhibition for 4 consecutive years (2014-2018).
- Elected as a representative of SAC (Student Affair Council) at IISER Kolkata and Departmental representative for consecutive years.
- Associated with the institute outreach programme from 2013- present day.

- Represented Department of Geology, Durgapur Government College in Inter-college exhibitions and outreach activities from 2010-2013.
- Actively participated in several drama, singing competitions held in IISER Kolkata and Durgapur Government College.
- Actively participated as a fest coordinator in several scientific fests in IISER Kolkata and Durgapur Government College.
- Organised several cultural events in IISER Kolkata and Durgapur Government College.

#### PROFESSIONAL REFERENCES:

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1. Prof. Prasanta Sanyal

Department of Earth Sciences

IISER Kolkata

Email- [psanyal@iiserkol.ac.in](mailto:psanyal@iiserkol.ac.in)

2. Prof. Vikrant Jain

IIT Gandhinagar, Gandhinagar

[Email-vjain@iitgn.ac.in](mailto:vjain@iitgn.ac.in)

3. Dr. Rasmus Thierde

Christian-Albrechts-Universität zu Kiel, Germany

Email- [rasmus.thiede@ifg.uni-kiel.de](mailto:rasmus.thiede@ifg.uni-kiel.de)

4. Dr. Felix Elling

Christian-Albrechts-Universität zu Kiel, Germany

Email- [felling@leibniz.uni-kiel.de](mailto:felling@leibniz.uni-kiel.de)

5. Dr. Francien Peterse

Department of Earth Sciences

Utrecht University

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6. Dr. Sayantan Sarkar

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IIT Mandi

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7. Dr. Santosh K. Shah

BirbalSahini Institute of Paleobotany

Email- [santoshk.shah@gmail.com](mailto:santoshk.shah@gmail.com)

#### CONTACT DETAILS:

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