DR. KOUSHICK SEN
Project Scientist 'II'
Hydrothermal Research Group
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Academic Qualification:

Ph.D. (2015): **Geology** from **Wadia Institute of Himalayan Geology,** Dehradun, India

M.Tech. (2009): **Petroleum Exploration** from **Indian School of Mines**, Dhanbad, India

M.Sc. (2007): **Applied Geology** from **Presidency College**, Kolkata, University of Calcutta, India

B.Sc. (2005): **Geology** from **J.K. College** Purulia, Burdwan University, India

Professional career: (from the latest one)

Project Scientist: National Center for Polar and Ocean Research, Goa. (7th July 2016 – till date)

Extended Senior Research Fellow: Wadia Institute of Himalayan Geology, Dehradun. (2014-16)

Junior & Senior Research Fellow: Wadia Institute of Himalayan Geology, Dehradun (2010-14)

Fields of Scientific Interests:

Mid Ocean Ridge Tectonics and Hydrothermal Mineralization
Electron Probe Micro-Analyzer (EPMA) applications and analyses of various geological samples
Himalayan Geodynamics (Suture Zone ophiolites and mélanges)

Instrumentation and Technical skills:

Quantitative mineralogical characterization. Presently, in-charge of **CAMECA SX-FIVE EPMA at NCPOR**. Received in hand training on **Electron Probe Micro Analyzer (EPMA)** Operation, Maintenance and advanced applications. The training was on basic hardware and CAMECA PEAKSIGHT software which includes SE, BSE, CL image setup and acquisition, WDS setup for qualitative and quantitative analysis, qualitative and quantitative X-Ray mapping techniques, Trace element quantitative analysis etc

Isotope Ratio Mass Spectrometry (IRMS) for Oxygen and Carbon Stable Isotope analysis. Received in hand instrumentation training for Oxygen isotope analysis of Silicates minerals

Laser Raman spectroscopy (Handled LabRAM HR - Horiba Jovin Yuvon instrument- 514.5 nm Argon Laser for incipient mineral and volatile phases during PhD)

Participated in **scientific expedition** as exploration geologist on **ORV MGS Sagar Cruise** to **Mid-Oceanic-Ridges** of Indian Ocean (~350 days in last 8 years) as part of **Hydrothermal Sulphide Exploration** programme, NCPOR, Ministry of Earth Sciences, Govt of India.

Awards/ Recognitions/ Memberships:

- Qualified Graduate Aptitude Test for Engineering in 2007 (**GATE** 2007)
- Qualified National Eligibility Test in 2011(**CSIR NET JRF** + Lectureship)
- Scholarship from **MHRD** (Ministry of Human Resource, India) during M.Tech (2007-2009)
- **Wadia National Fellowship** Pursuing research (PhD) in Himalayan Geology,
- **International Travel grant** from International Association of Sedimentologists (**IAS**).
- Acting as a **Review Editor** in Structural Geology and Tectonics, part of the journal(s) **Frontiers in Earth Science.**

Publications:

1. **Koushick Sen**, P. John Kurian, Parijat Roy, Sunil Vadakkepuliyambatta, Georgy Cherkashov, L. Surya Prakash, Katherine Kuksa, Vladislav Kuznetsov, Anna Firstova, Abhishek Tyagi, Deepak K. Agarwal, Fedor Maksimov, Signature of off-axis hydrothermal sulfide mineralization at 23.19°S of Central Indian Ridge: Insights from mineralogy, geochemistry, geochronology and near-seabed AUV survey (2025) ***Marine Geology***, 482, 107500, https://doi.org/10.1016/j.margeo.2025.107500.

2. Parijat Roy, **Koushick Sen**, Surya Prakash L., V. Yu Kuznetsov, Fedor Maksimov, Deepak Kumar, S.S. Sawant, Deepak Kumar Agarwal, Srinivas Rao A., P. John Kurian, Geochronology and geochemical characteristics of sulphides from Tianzuo hydrothermal field (63°32′ E), South West Indian Ridge, ***Marine and Petroleum Geology***, Volume 180, (2025), 107483, ISSN 0264-8172, https://doi.org/10.1016/j.marpetgeo.2025.107483

3. Surya Prakash, L., John Kurian, P., **Sen, K**., Tsunogai, U., Linsy, P., Shuhail, M., & Roy, P. (2025). Hydrothermal Methane Venting and Its Microbial Oxidation Along the Eastern Southwest Indian Ridge, 63.5°–68°E. ***Geophysical Research Letters***, 52(2), e2024GL110958. https://doi.org/https://doi.org/10.1029/2024GL110958

4. Bhagyashree Doley, Abhishek Saha, M. Ram Mohan, **Koushick Sen**, Aditya Peketi, (2024). Petrogenesis of submarine volcanic arc rocks from Andaman subduction zone, Northeast Indian Ocean: Constraints from slab components and mantle wedge characteristics, ***Chemical Geology***, Volume 659, 122118, ISSN 0009-2541, https://doi.org/10.1016/j.chemgeo.2024.122118

5. Prakash, L. S., John, K. P., Resing, J. A., Tsunogai, U., Rao, A. S., **Sen, K**., Lupton, J. E., Baumberger, T., Prajith, A. and Roy, P. (2022). Volatile-rich hydrothermal plumes over the southern Central Indian Ridge, 24^{0}49' S: Evidence for a new hydrothermal field hosted by ultramafic rocks. ***Geochemistry, Geophysics, Geosystems***, https://doi.org/10.1029/2022GC010452

6. Yogesh Ray, Subhajit Sen, **Koushick Sen**, M. Javed Beg, (2021). Quantifying the past glacial movements in Schirmacher Oasis, East Antarctica, ***Polar Science***, Volume 30

7. Souvik Das, Asish R. Basu, Barun K. Mukherjee, Franco Marcantonio, **Koushick Sen**, Satadru Bhattacharya, Robert T. Gregory (2020). Origin of Indus ophiolitehosted ophicarbonate veins Isotopic evidence of mixing between seawater and continental crust-derived fluid during Neo-Tethys closure. ***Chemical Geology***.

8. **Sen, K**., Mukherjee, B. K., Manas M., Sen, K., and Mukherjee, S. (2019). Two-stage exhumation of Zildat Ophiolitic Melange rocks, NW Himalaya, India. ***Himalayan Geology***, 40(2), 182-189.

9. Naveen, S. Sarkar, T. Nirmal Kumar, D. Ray, S. Bhattacharya, A.D. Shukla, H.Moitra, A. Dagar, P. Chauhan, **K. Sen**, S. Das. (2019). Mineralogy and spectroscopy (VIS near infrared and micro-Raman) of chromite from Nidar ophiolite complex, SE Ladakh, India Implications for future planetary exploration. ***Planetary and Space Science***, 165, 1-9.

10. Das Souvik, Mukherjee Barun K, Basu A R, **Sen Koushick**., 2015, "Peridotitic minerals of the Nidar Ophiolite in the NW Himalaya: sourced from the depth of the mantle transition zone and above" ***Geological Society, London***, Vol - 412, Issue - SP412. 12.

11. **Sen Koushick**, Das Souvik, Mukherjee Barun K, Sen Koushik., 2013, Bimodal stable isotope signatures of Zildat Ophiolitic Mélange, Indus Suture Zone, Himalaya: implications for emplacement of an ophiolitic mélange in a convergent set-up, ***International Journal of Earth Sciences***. Vol 102 (7) 2033-2042.

Cover Image:

1. **Sen Koushick, "**Section of Nidar Ophiolite, Indus Suture Zone, Himalaya". Cover Image published in ***Geology*** (GSA), Vol.45,No.8,2017

2. **Sen Koushick**, "Pseudo-Nodules in Chakrata Formation: A syndepositional record of paleoseismicity", Cover Photo published in ***Himalayan Geology***, Vol.31,No.2,2010.