

## Dr. Sonal Khanolkar

Assistant Professor Department of Earth Sciences Indian Institute of Technology Gandhinagar Palaj, Gandhinagar 382055, India Languages: Indian (Native); English (Fluent); German (A1 Level) ORC Id: 0000-0002-7911-1699	Nationality: Indian Gender: Female Phone: +91 7923952325 E-mail ids: sonal.khanolkar@iitgn.ac.in skhanolkar@geomar.de
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### RESEARCH PROFILE

I have a scientific background in Earth Sciences and Geology. During my research career, I conducted studies within a series of different disciplines, including Biostratigraphy, Micropaleontology (Foraminifera), Palaeoecology, Paleoclimatology, Paleocenoigraphy, and Geochemistry. My PhD thesis work led to the revision of the biostratigraphic age models of the Paleogene sequences in sedimentary basins of western India, which form the basis for the paleoclimate reconstructions. Results obtained from my work were presented at international conferences and are published in relevant peer reviewed journals. I also gained experience as a shipboard scientist (planktonic foraminifera biostratigrapher) on International Ocean Discovery Program Expedition 378: South Pacific Paleogene Climate.

### EMPLOYMENT

07/2024 to Present	<b>Assistant Professor at Department of Earth Sciences, Indian Institute of Technology Gandhinagar, Gujarat, India</b> <b>Specialization (Micropaleontology, Biostratigraphy, Paleobiology, Paleoclimate)</b> Teaching Courses: Post Graduate Level Geobiology (August 2024-Dec 2024)
09/2022-07/2024	<b>Post-Doctoral Fellow at GEOMAR Helmholtz Centre for Ocean Research, Kiel (Paleoceanography Research group of Prof. Martin Frank).</b> <b>Post Doc Mentor: Dr. Eleni Anagnostou</b>  <b>DFG funded project title: Carbon cycle-ice sheet interactions during the Eocene-Oligocene transition phase</b> Project duties: Planktic and benthic foraminifera species identification and stratigraphy for IODP Site 378. Understanding the paleodepth habitat of planktic foraminifera using carbon and oxygen isotopes, species specific calibration of planktic foraminifera for Mg/Ca-sea surface temperature and boron isotope (pH) proxy. I have gained experience working in state of art clean labs (boron free), column chemistry and mass specs (Element XR and Neptune MC-ICP-MS)
03/2022-07/2022	<b>Research @ Tübingen Fellow and Lecturer of Geosciences (Terrestrial Sedimentology group of Prof. Kathryn Fitzsimmons)</b> at the University of Tübingen, Germany; Fellowship awarded in Dec 2021.
07/2019- 12/2021	<b>Max Planck Society Postdoctoral Fellow</b> at the Max Planck Institute for Chemistry, Germany (Climate Geochemistry Department of Prof Gerald. H. Haug): <b>Post Doc Mentor: Prof Ralf Schiebel</b>  Project title: Understanding the evolutionary response of fossil larger benthic foraminifera using trace elements. During my tenure, I have gained experience working in clean laboratories, fs-LA-ICP-MS, technique for trace element analysis of foraminifera.

03/2017-06/2019	<p><b>Department of Science and Technology (India) Inspire Faculty Fellow at the Indian Institute of Technology Kanpur. (Role: Principal Investigator)</b></p> <p>Project title: “Paleobiology of foraminifera during Eocene hyperthermal events”. During my tenure at IIT Kanpur, I established the micropaleontology lab with the research grant provided, carried out extensive field work in Jaisalmer Basin of western India and demarcated the first-continuous on-land PETM section in India using foraminifera biostratigraphy and carbon isotope stratigraphy.</p> <p>During this tenure, I also worked with <b>Prof Rajiv Sinha’s group of Terrestrial Sedimentology, Paleoclimate and Remote Sensing at IIT Kanpur</b> and assisted in research and teaching activities.</p>
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## EDUCATION

08/2016	<p><b>PhD in Biostratigraphy and Micropaleontology</b>, Indian Institute for Technology Bombay (India) “Response of shallow marine foraminifera to Eocene Climate Change in India”. <b>Advisor: Prof. Pratul Kumar Saraswati.</b></p> <p>During my PhD tenure at IIT Bombay, I worked on shallow marine Eocene sections from sedimentary basins in western India, which have pristinely preserved foraminifera and can be used for paleoclimate reconstruction. My PhD work led to constraining the ages of these shallow marine on-land sections using larger benthic foraminifera and planktic foraminifera biostratigraphy and understanding the paleoecology and paleodepositional conditions using foraminiferal assemblage studies. <b>(CPI: 9.82)</b></p>
08/2010	<p><b>MSc in Applied Geology</b>, Indian Institute for Technology Bombay (India). <b>(CPI: 8.46)</b></p>
06/2007	<p><b>BSc in Geology</b>. St. Xavier’s College, University of Mumbai .87.8%</p>
02/2004	<p>Class 12<sup>th</sup> (Higher Secondary Certificate Examination): 73%</p>
03/2002	<p>Class 10<sup>th</sup> (Secondary School Certificate): 77.46%</p>

## RESEARCH GRANTS/AWARDS

09/2022	GEOMAR Helmholtz Post doc fellowship
08/2022	Science Education and Research Board of India, Ramanujan Fellowship (Declined)
05/2022	Marie Skłodowska Curie Post Doc Fellowship (Seal of Excellence Award) Awarded to the proposals which are ranked >85% scores under Horizon Europe MSCA Actions Call 2021, but could not be funded due to budgetary constraints.
12/2021	Research @Tuebingen Fellowship (Awarded to those who are ranked highest amongst the applicants)
12/2019	Ministry of Earth Sciences (Participation in International Ocean Discovery Program-378) (INR 4 lakhs)
07/2019	Max Planck Society Post-Doctoral Fellowship
03/2017-06/2019	Department of Science and Technology Inspire Faculty Fellowship, India (INR 35 lakhs).
03/2017	National Postdoctoral Fellowship, India (Science and Education Research Board, (India) (INR 4 lakhs).
03/ 2015	International Association of Sedimentologists Travel Grant to attend the EGU General Assembly, Vienna, Austria (USD500).

03/2015	Takken Travel Grant, Association of Women Geoscientist to attend the EGU General Assembly, Vienna, Austria (USD500).
12/2013	American Geophysical Union Travel Grant (USD1000).
03/2011	Florida State University Graduate Fellowship to pursue Ph.D. study (Declined).
06/2010	Graduate Aptitude Test in Engineering-Indian Institute of Technology Fellowship to pursue Ph.D.
06/2010	University Grants Commission Fellowship to pursue PhD at CSIR - UGC Govt. of India (All India Rank: 63).
06/2008	All India Rank 12 in Geology and 34 in Geophysics, Joint Admission to Masters (JAM), IIT
06/2007	Completed Honours Program with A+ grade during B.Sc in Geology from St. Xavier's College, Mumbai
06/2007	Ranked 2 <sup>nd</sup> in the order of merit, Bachelor of Science (Geology), University of Mumbai.

### RESEARCH EXPEDITIONS AND FIELDWORK

01/2014-03/2014	Geological Field in Paleogene sections of Western India (Kutch, Cambay): The field work included stratigraphic sampling of the Paleogene sections of Kutch, identification of different stratigraphic contacts, major unconformities based on palaeontology.
01/2020 – 02/2020	Shipboard Scientist IODP Expedition 378: South Pacific Paleogene Climate. Planktonic Foraminifera Biostratigrapher, recovering sediments spanning the modern to Eocene.

### INVITED TALKS / SEMINARS

06/2019	Delivered lecture titled: "Importance of Microfossils in addressing past climate change: Records from International Ocean Discovery Program" organized by Department of Geology, K. J. Somaiya College of Science and Commerce, University of Mumbai, India (Online mode)
03/2021	Delivered research seminar titled. "Evolutionary response of shallow marine foraminifera to the extreme climate states of Cenozoic within the Indian subcontinent" organized by National Institute of Science Education and Research, Bhubaneswar, India (Online Mode)

**LIST OF PUBLICATIONS:** Total number of citations=439 (Google Scholar, 27.06.2024)

#### **(a) Publications in peer-reviewed scientific journals**

2024	Jiang, L., Ausín, B., <b>Khanolkar, S.</b> , Wang, Y. and George, S. C. ( <b>Accepted for publication in Paleo-3</b> ) Carbon Isotope and Biolipid Unlock the Myth of Paleocene Climate in Southern Pacific Ocean. Open Access SSRN Electronic Journal. DOI 10.2139/ssrn.4733441.
2022e	Pereira, C., <b>Khanolkar, S.*</b> , Banerjee, S., Orcan, E, and Saraswati, P.K. Reply to Comment On "Larger benthic foraminifera and Microfacies of Late Paleocene -Early Eocene Sections in Meghalaya, Northeast India" by Hadi, M. (2022). <i>Journal of Foraminiferal Research</i> 52(4):1-2.

2022d	Öğretmen, N*, Schiebel, R., Jochum, K. P., Galer, S.J.G, Leitner, J., Khanolkar, S., Yucel, M., Stoll, B., Weis, U., Haug, G. H. High precision femtosecond laser ablation ICP-MS measurement of benthic foraminiferal Mn-incorporation for paleoenvironmental reconstruction: A case study from the Plio-Pleistocene Caribbean Sea. <i>Geochemistry, Geophysics, Geosystems</i> . <a href="https://doi.org/10.1029/2021GC010268">https://doi.org/10.1029/2021GC010268</a>
2022c	Roy Choudhury, T., <b>Khanolkar, S.</b> , Banerjee, S* Glauconite authigenesis during the warm climatic events of Paleogene: Case studies from shallow marine sections of Western India. <i>Global and Planetary Change</i> , <b>214</b> , <a href="https://doi.org/10.1016/j.gloplacha.2022.103857">https://doi.org/10.1016/j.gloplacha.2022.103857</a>
2022b	Roy Choudhury, T., Banerjee, S*., <b>Khanolkar, S.</b> , Meena, S. S. Paleocyanographic conditions during the Paleocene-Eocene transition imprinted within the glauconitic Giral Member of the Barmer Basin, India. <i>Minerals</i> , <b>12</b> , 56. <a href="https://doi.org/10.3390/min12010056">https://doi.org/10.3390/min12010056</a> .
2022a	Pereira, C., <b>Khanolkar, S.*</b> , Banerjee, S., Orcan, E, and Saraswati, P.K. Larger benthic foraminifera microfacies and carbon isotope stratigraphy from the Late Paleocene-Early Eocene Succession of Meghalaya, North-East India. <i>Journal of Foraminiferal Research</i> <b>52</b> (1), 43–59.
2021c	<b>Khanolkar, S*</b> , Schiebel, R., Singh, A., Saraswati, P.K., Jochum, K. P., Weis, U., Stoll, B., Haug, G. H. Intra-test variations in trace element composition of <i>Amphistegina lessonii</i> using femtosecond-laser ablation-ICP-mass spectrometry: A field study from Okinawa, Japan. <i>Geochemistry, Geophysics, Geosystems</i> . <a href="https://doi.org/10.1029/2020GC009443">https://doi.org/10.1029/2020GC009443</a> .
2021b	Roy Choudhury, T., Banerjee, S*., <b>Khanolkar, S.</b> , Saraswati, P. K., Meena, S. S. Glauconite authigenesis during the onset of the Paleocene-Eocene Thermal Maximum: A case study from the Khuiala Formation in Jaisalmer Basin, India. <i>Palaeogeography, Palaeoclimatology, Palaeoecology</i> <b>571</b> , 110388, <a href="https://doi.org/10.1016/j.palaeo.2021.110388">https://doi.org/10.1016/j.palaeo.2021.110388</a> .
2021a	<b>Khanolkar, S*</b> , Roy Choudhury, T., Saraswati, P. K., Banerjee, S. Late Palaeocene-Early Eocene Foraminiferal assemblage and carbon isotope stratigraphy of Jaisalmer, western India. <i>Journal of Foraminiferal Research</i> . v. <b>51</b> (1) pp. 4-13.
2020b	Banerjee, S*., Roy Choudhury, T., Saraswati, P.K., <b>Khanolkar, S.</b> Authigenic mineral formation during Palaeogene warm climatic intervals. <i>Journal of Paleogeography</i> <b>9</b> , 27, <a href="https://doi.org/10.1186/s42501-020-00076-8">https://doi.org/10.1186/s42501-020-00076-8</a> .
2020a	Misra, P., Farooqui, A., Sinha, R*., <b>Khanolkar, S</b> and Tandon, S.K. Millennial-scale vegetation and climatic changes from an Early to Mid-Holocene lacustrine archive in Central Ganga Plains using multiple biotic proxies. <i>Quaternary Science Reviews</i> . <b>243</b> , 106474. <a href="https://doi.org/10.1016/j.quascirev.2020.106474">https://doi.org/10.1016/j.quascirev.2020.106474</a> .
2019b	<b>Khanolkar, S*</b> and Sharma, J. Record of early to middle Eocene paleoenvironmental changes from lignite mines, western India. <i>Journal of Micropaleontology</i> . v. <b>38</b> (1) pp.1-24.
2019a	<b>Khanolkar, S*</b> and Saraswati, P. K. Eocene Foraminiferal Biofacies in Kutch (India) In context of Paleoclimate and Paleocology. <i>Journal of Palaeogeography</i> . doi:10.1186/s42501-019-0038-2.
2018b	Banerjee, S*., <b>Khanolkar, S.</b> and Saraswati, P. K. Facies, and depositional setting of the Palaeogene carbonates in Kutch. <i>Geodinamica Acta</i> . <a href="https://doi.org/10.1080/09853111.2018.1442609">10.1080/09853111.2018.1442609</a> .
2018a	Saraswati, P. K*., <b>Khanolkar, S.</b> and Banerjee, S. Paleogene stratigraphy of Kutch, India: An update about progress in foraminiferal biostratigraphy. <i>Geodinamica Acta</i> . <a href="https://doi.org/10.1080/09853111.2017.1408263">10.1080/09853111.2017.1408263</a> .
2017	<b>Khanolkar, S.</b> , Saraswati, P. K* and Roger, K. Ecology of foraminifera during the Middle Eocene Climatic Optimum in Kutch, India. <i>Geodinamica Acta</i> . v. <b>29</b> (2), pp. 1-13.

2016c	Saraswati, P.K*., <b>Khanolkar S.</b> , Raju, D.S.N., Banerjee, S. An Updated Eocene Stratigraphy of Kutch. <i>Journal of Geological Society of India (Special Publication)</i> , v.6, pp. 25-31.
2016b	Saraswati, P. K*., Banerjee, S., Sarkar, U., Chakraborty, S., <b>Khanolkar, S.</b> Eocene depositional sequences and cycles. <i>Journal of Geological Society of India (Special Publication)</i> , v.6, pp. 46-56.
2016a	<b>Khanolkar, S*</b> , Saraswati, P. K. Some observations on an atypical planktic foraminifer from the Middle Eocene of Kutch, India. <i>Journal of Micropaleontology</i> . v. 35, pp. 54–61, doi: 10.1144/jmpaleo2015-004.
2015	<b>Khanolkar, S*</b> , Saraswati, P. K. Ecological response of shallow marine foraminifera to Early Eocene warming in equatorial India. <i>Journal of Foraminiferal Research</i> , v. 45 (3), pp. 293–304.
2014b	Saraswati, P.K*., <b>Khanolkar, S.</b> , Raju, D.S.N., Dutta, S., Banerjee, S. Foraminiferal biostratigraphy of lignite mines of Kutch, India: Age of Lignite and Fossil Vertebrates. <i>Journal of Palaeogeography</i> , v. 3(1), pp. 90 – 98.
2014a	<b>Khanolkar, S</b> and Saraswati, P. K*. Palaeoenvironmental Significance of Rectilinear Benthic Foraminifera in the Middle Eocene section of Matanaomadh Sub-basin, Kutch. <i>Journal of Geological Society of India (Special Publication)</i> ,v. 1, pp. 203–209.

### (c) Shipboard Reports/ Proceedings

2020	Thomas, D.J., Röhl, U., Childress, L.B., and the <b>Expedition 378 Scientists</b> , 2020. Expedition 378 Preliminary Report: South Pacific Paleogene Climate. International Ocean Discovery Program. <a href="https://doi.org/10.14379/iodp.pr.378.2020">https://doi.org/10.14379/iodp.pr.378.2020</a> .
2022	Thomas, D.J., Röhl, U., Childress, L.B., and the <b>Expedition 378 Scientists</b> , 2020. Expedition 378 Proceedings: South Pacific Paleogene Climate. International Ocean Discovery Program.

### (d) Book chapters

2020	<b>Khanolkar, S.</b> , Tandon, S. K* and Sinha, R. Late Quaternary evolution and morphostratigraphic development of the Ganga Plains. <i>Geodynamics of the Indian Plate</i> . Springer Publication pp 467-497.
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### CONFERENCE PRESENTATIONS

2024	Aich, S., Dasgupta, S., <b>Khanolkar, S.</b> , Singh, K.H., Changes in the benthic foraminiferal assemblage within the Middle Eocene Bassein B Formation, Bombay Offshore basin, western India. Paper number: 511, International Association of Sedimentologists Conference 2024, June 25- 27. International Association of Sedimentologists. Aberdeen, Scotland, UK. [POSTER]
2023	<b>Khanolkar, S*</b> , Anagnostou, E., Westerhold T., Drury, A.J., Friedrich, O. Atmospheric CO <sub>2</sub> and sea surface temperature across the late Eocene and early Oligocene from South Pacific: Site U1553, IODP 378 Expedition. Goldschmidt 2023, Lyon, France 9-14 <sup>th</sup> July [POSTER]
2023	Anagnostou, E*., Babila, T., Chalk, T. B., Henehan, M., <b>Khanolkar, S.</b> , Ausin, B., Westerhold T. Foraminiferal boron isotope proxy for pH/atmospheric CO <sub>2</sub> reconstructions: evolving updates and new data. Goldschmidt 2023, Lyon, France 9-14 <sup>th</sup> July [INVITED TALK]

2023	Nambiar R*, Coenen D., Henehan M. J., <b>Khanolkar, S.</b> , Stassen P., Renema, W., Leroy A., Moreau F., Cotton L., Müller, W., Evans, D. Reconstructing the magnesium isotopic composition of Paleogene seawater using larger benthic foraminifera Goldschmidt 2023, Lyon, France 9-14 <sup>th</sup> July [POSTER]
2021	<b>Khanolkar, S*</b> , Schiebel, R., Singh, A., Saraswati, P. K., Jochum, K. P., Weis, U., Stoll, B., Haug, G. H. Intra-test heterogeneity in trace element composition of <i>Amphistegina lessonii</i> as proxy of ambient seawater temperature and tidal height. Goldschmidt 2021 Virtual, 4-9th July 2021 [ORAL].
2019	Pereira, C*, <b>Khanolkar, S.</b> , Banerjee, S., Orcan, E and Saraswati, P.K. Carbon Isotope Stratigraphy and Environmental changes in the Late Paleocene-Early Eocene Succession of Meghalaya. Geological Society of America Annual Meeting, 22-25th Sept, 2019, Phoenix, Arizona [ORAL].
2019	Banerjee S*, Chowdhury, T., <b>Khanolkar, S</b> and Saraswati, P.K. The origin of Palaeogene glauconites in the palaeo-Tethyan margins in the background of warming events. 34th IAS International Meeting of Sedimentologists 10-13 Sept, 2019, Rome [ORAL].
2017	Bhattacharya, G*, Robinson, D., Orme, D. A., Najman, Y and <b>Khanolkar, S.</b> Depositional characteristics of the Indus Group in the India-Asia collision zone, northwest India. American Geophysical Union Fall Meeting 11-15th Dec, New Orleans [ORAL].
2017	<b>Khanolkar, S*</b> and Sharma, J. An Integrated Study of palynomorphs and Foraminifera to Record the Changes in Palaeovegetation And Palaeodepositional Conditions From Eocene Lignite Mine Sections In Western India. Geological Society of America Annual Meeting, Seattle [ORAL].
2015	<b>Khanolkar, S*</b> , Saraswati, P. K and Rogers, K. Ecological response of foraminifera to past warming events in Bartonian section of Western India using carbon isotope stratigraphy. European Geosciences Union, General Assembly [ORAL].
2013	<b>Khanolkar, S*</b> and Saraswati, P. K. Characteristics of Foraminifera from Eocene Hyperthermal Events in Western India. American Geophysical Union Fall Meeting [POSTER].
2013	Saraswati P. K*, Williams, R.H., Chattopadhyay, A., <b>Khanolkar, S.</b> , Summons, R. E., and Dutta, S (2013). Integrated Biostratigraphy, Carbon Isotope Stratigraphy and biomarker Study of an Early Eocene Section in Western India: Hyperthermal Events and Palaeoenvironment. 26th International Meeting on Organic Geochemistry, 15th – 20th September 2013, Tenerife, Organic Geochemistry: Trends for 21st Century, Volume 2 [POSTER].

### PEER-REVIEWER

Science of the Total Environment, Ocean Science (EGU), iScience (Cell Press Journal), Paleo-3, Journal of Earth System Science, Frontiers in Marine Science, Marine Geology, Frontiers in Earth Sciences, Journal of Sedimentary Environments, Palaeontographica Abt. A, Geo-Marine Letters, Historical Biology, Revue de Micropaleontologie, The Holocene, Journal of Paleogeography, Journal of Geological Society of India, Journal of Paleontological Society of India, Books by Elsevier

### PROFESSIONAL MEMBERSHIP

European Association of Geochemistry  
Cushman Foundation for Foraminiferal Research

## TEACHING EXPERIENCE

03/2022-07/2022	Lecturer of Geoscience, Universität Tübingen (B.Sc course module: Sedimentology and Stratigraphy)
11/2021-04/2022	Lecturer in Geology, University of Mumbai, India (Metamorphic Petrology)
2018	Teaching Assistant for the Undergraduate Course (ES 412) Sedimentology and Stratigraphy at IIT Kanpur
2011-2015	Teaching Assistantship at IIT Bombay: Paleontology Lab and Micropaleontology Lab.
2016	Taught undergraduate students (B.Sc 2nd year): Palaeontology course, St. Xaviers College, Mumbai

## PROGRAMMING: Python and R

### OUTREACH ACTIVITY :

11/2020 Recorded the first episode Podcast for What on Earth?! Podcast! Series for the Earth Science community.

Date: 08.07.2024

Place: Gandhinagar, India