

Mainak Mookherjee

Department of Earth, Ocean and Atmospheric Sciences,
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i. Professional Preparation

Education and Training

Institution	Major	Degree	Year
University of Cambridge, U.K.	Mineral Physics	PhD.	2004
Indian Inst. of Technology Bombay, India	Applied Geology	MSc.	1999
Jadavpur University, Kolkata, India	Geology	BSc.	1997

ii. Appointments

2024-present	Professor, Florida State University, Tallahassee, FL
2019-2024	Associate Professor, Florida State University, Tallahassee, FL
2015-2019	Assistant Professor, Florida State University, Tallahassee, FL
2012-2015	Research Scientist, Cornell University, Ithaca, NY
2008-2012	Visiting Researcher, Bayerisches Geoinstitut, Bayreuth, Germany
2006-2008	Post-doctoral Researcher, Yale University, New Haven, CT
2003-2005	Post-doctoral Researcher, Univ. of Michigan, Ann Arbor, MI

iii. Narrative of Research Experience

My research uses mineral physics—combining high-pressure experiments, spectroscopy, and computational modeling—to understand how water and other volatiles move through Earth's mantle and influence melting, conductivity, and seismic anomalies in subduction zones. This work spans from atomic-scale structure and elasticity of hydrous minerals to their implications for deep Earth processes like the deep mantle hydration and magma transport.

iii. Publications (*, ~, #, ^ Mookherjee's post-doc, graduate, undergraduate, and high-school advisees)

- Ashley, A. W#, **Mookherjee, M.**, Constraints on the Viscosity of Water at High Pressures and Temperatures using Particle Tracking Analysis, *Mineralogical Magazine*, 90, 272–285.
- Ashley, A. W#, **Mookherjee, M.**, Xu, M., Yu, T., Manthilake, G., and Wang, Y., 2025, The viscosity of albitic melt at high pressures and implications for the mobility of crust-forming magmas, *Journal of Geophysical Research Solid Earth*, <http://doi.org/10.1029/2024JB030527>.
- Ashley, A. W#, Manthilake, G., Schiavi, F., and **Mookherjee, M.**, 2025, Insights into the chemical evolution of sub-arc magmas from the high-pressure electrical conductivity of basaltic and andesitic magmas, *Geology*, <http://doi.org/10.1130/G52545.1>.
- Ashley, A. W#, Bajgain, S\$, and **Mookherjee, M.**, 2024, Mobility of magmas within the Earth: Insights from the elasticity and transport properties of hydrous albitic melts, *Geochemistry, Geophysics, Geosystem*, 25, e2024GC011510, doi:10.1029/2024GC011510.
- Ashley, A. W#, **Mookherjee, M.**, Xu, M., Yu, T., Manthilake, G., and Wang, Y., 2024, Viscosity measurements at High Pressures: A Critical Appraisal of Corrections to Stokes' Law, *Journal of Geophysical Research Solid Earth*, 129, e2023JB028489.
- Basu, A\$, **Mookherjee, M.**, Clapp, S*, Chariton, S., and Prakapenka, V. B., 2023, High-pressure Raman scattering and X-ray diffraction of kaolinite, $\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4$, *Applied Clay Science*, 245, 107144.
- Basu, A\$, **Mookherjee, M.**, Bucag, C*, Tkachev, S., and Wunder, B., 2023, High-pressure behavior of 3.65 Å phase: Insights from Raman Spectroscopy, *American Mineralogist*, 108, 1547-1557.
- Bajgain, S\$, Ashley, A. W#, **Mookherjee, M.**, Ghosh, D. B., and Karki, B. B., 2022, Insights into magma ocean dynamics from the transport properties of basaltic melt, *Nature Communications*, 13, 7590.

- Peng, Y#, **Mookherjee, M.**, Hermann, A., Manthilake, G., and Mainprice, D., 2022, Anomalous elasticity of talc at high pressures: Implications for subduction systems, *Geoscience Frontiers*, 13, 101381,
- Basu, A\$, **Mookherjee, M.**, McMahan, E*, Haberl, B., and Boehler, R., 2022, Behavior of Long-Chain Hydrocarbons at High Pressures and Temperatures, *The Journal of Physical Chemistry B*, 126, 2350-2357.
- Peng, Y#, Manthilake, G., and **Mookherjee, M.**, 2022, Electrical conductivity of metasomatized lithology in subcontinental lithosphere, *American Mineralogist*, <http://doi.org/10.2138/am-2021-7942>.
- Bajgain, S\$, and **Mookherjee, M.**, 2021, Carbon bearing aluminosilicate melt at high-pressure, *Geochimica Cosmochimica Acta*, 312, 106-123.
- Bajgain, S\$, **Mookherjee, M.**, and Dasgupta, R., 2021, Earth's core could be the largest terrestrial carbon reservoir, *Communications Earth and Environment*, 2, 165, <https://doi.org/10.1038/s43247-021-00222-7>.
- Basu, A\$, and **Mookherjee, M.**, 2021, Intercalation of Water in Kaolinite ($\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4$) at Subduction Zone Conditions: Insights from Raman Spectroscopy, *ACS Earth and Space Chemistry*, 5, 834-848,

iv. Mentoring

M. Sc. Students: Mr. Brandon Bourassa (2026- present); Ms. Erin Scott (2025-); Mr. Connor Perkins (2025-)

Ph. D. Students: Dr. Aaron W. Ashley (2019- 2024), recipient of the 2025 Mineral and Rock Physics Grad. Student Award, AGU; Dr. Ye Peng (2016-2021); now Researcher at the Deep Space Exploration Laboratory (Tiandu Laboratory); recipient of the 2022 Mineral and Rock Physics Grad. Student Award, AGU

Post- Doctoral Scholars: Dr. Sajin Satyal (2026-present); Dr. Abhisek Basu (2018-2023; visiting Assistant Professor at Pacific Lutheran University, Tacoma, WA); Dr. Suraj Bajgain (2016-2022; Assistant Professor at Geology, Department of Marine & Earth Sciences, The Water School, Florida Gulf Coast University, FL); Dr. Gaurav Shukla (2017; Assistant Professor at IISER Kolkata, India); Dr. Sumudu Tennakoon (2016-2017; Apex Analytics, NC)

v. Honors

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| 2026 | <i>Nominated</i> for Outstanding Teaching in the Major (Undergraduate)
The University Teaching and Advising Awards Committee, FSU |
| 2024 | Fulbright-Nehru Academic and Professional Excellence Fellowship
2024-2025 Fulbright US Scholar to India |
| 2024 | Global Visitor Fellow, Earth & Planets Laboratory,
Carnegie Institution for Science, Washington, DC |
| 2023 | Fellow, Mineralogical Society of America |

vi. Synergistic Activities

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| 2026-present | Special Publications Editor of <i>American Mineralogist</i> |
| 2025 | Feedback to a first-time AGU presenter, Fall AGU, NOLA |
| 2022-present | Associate Editor of <i>Scientific Reports</i> |
| 2015-present | Associate Editor of <i>Frontiers in Earth Sciences: Earth and Planetary Materials</i> |
| 2023-present | <i>Earth and Planetary Science Letters</i> (Editorial Advisory Board Member) |
| 2016-2025 | Associate Editor of <i>American Mineralogist</i> |
| 2022-2025 | Committee member for the MSA Lecture Program |
| 2019-2022 | Committee member for the MSA Committee member for the Kraus Crystallographic Research Grant. |