Dr. Ratan Das
E-mail: ratandasdjn91@gmail.com
ratan.das@cottonuniversity.ac.in
Phone: +91-7977026021

Broad Areas of Research

Engineering Geology, Rock Mechanics.

Education

Post-Doctoral Fellow, Department of Geology and Geophysics, **IIT Kharagpur,** 2021.
Ph.D. Department of Earth Sciences, **IIT Bombay**, 2019.
M.Sc. (Applied Geology) Department of Earth Sciences, **IIT Bombay**, 2015.
B.Sc. (Geology) Department of Geology, Cotton College, **Gauhati University**, 2013.

Experience

Assistant Professor, Department of Geology**, Cotton University, Guwahati, Assam** *(7th May 2022 - Present)*
Assistant Professor, Department of Earth Science**, Assam University, Silchar, Assam** *(14th July 2021 - 6th May 2022)*
Post-Doctoral Fellow, Department of Geology & Geophysics**, IIT Kharagpur** (*17th March 2020 - 12th July 2021*)
Guest Assistant Professor, Department of Geology, **Rajiv Gandhi University, Itanagar** *(14th Sept 2018 – 13th March 2020)*
Teaching Assistant, Department of Earth Sciences, **IIT Bombay** *(16th July 2015 – 27th June 2018)*

Editorship

Guest Editor, Special Issue in **Discover Geoscience (Springer)** Link
Guest Editor, Special Issue in **Environmental Earth Sciences (Springer)** Link

Research Projects

Sl No	Project Title	Funding Agency	Year	Fund sanctioned (INR)
1	Evaluation of geohazard risks due to climatic and geologic factors in the Cachar-Tripura-Mizoram (CTM) fold belt of northeast India: A coupled hydromechanical and geotechnical modelling **File Number: SRG/2022/000447**	DST SERB	2022-2024 (2 years)	33,00,000
2	Analysis of growth and initiation mechanism of rainfall-induced debris slides in Dima Hasao, Assam	In-House	2023-2025	1,00,000

Consultancy projects ongoing/completed

Sl No.	Project Title	Funding Agency	Month, Year	Funds Sanctioned	Duration of the Project
1	To provide prepared rock core samples to the Department of Mechanical	IIT Guwahati	April, 2024	22,000	3 Months

	engineering, IIT Guwahati. **(Completed)**				
2	Preparation and submission of Slope Stability Study report for two working pits of Dillai Parbat Limestone Mines for inclusion in modified mining plan as per IBM requirement. **(Completed)**	CCI, Bokajan, (Govt. of India)	May, 2025	1,21,000	3 Months

Publications in International Journals

1. Mazumder D, **Das R**, Das S, T N Singh, 2025. Understanding the landslide trigger mechanism in gently dipping shale beds: A case study from Aizawl, Mizoram, India, **Journal of Earth System Science**, 134, 184. [eISSN: 0973-774X] https://doi.org/10.1007/s12040-025-02647-6

2. Mazumder D, **Das R**, Das S, 2025. Multi-Criteria Decision Analysis Framework for Landslide Susceptibility Mapping with Analytical Hierarchy Process in Parts of Assam–Arakan Fold Belt, India, **Geological Journal**, 1-16, [ISSN / eISSN: 0072-1050 / 1099-1034] https://doi.org/10.1002/gj.5229

3. Das S, **Das R**, Mazumder D, 2025. Runout Characteristics of Rainfall-Induced Debris Flow: A Case Study from Sonapur, Meghalaya, India, **Geotechnical and Geological Engineering**, 43, 122. [ISSN / eISSN: 0960-3182 / 1573-1529] https://doi.org/10.1007/s10706-025-03078-2

4. **Das R**, **2024**. Catastrophic landslide in Wayanad district of Kerala, India on July 30, 2024: A complex interplay between geology, geomorphology, and climate. **Landslides**. 22, 271–281. [ISSN / eISSN: 1612-510X / 1612-5118] https://doi.org/10.1007/s10346-024-02385-8

5. **Das R**, Singh TN, **2024**. Geotechnical Insights of the Cut Slopes Along Silchar-Haflong National Highway, Assam, India. **Geotechnical and Geological Engineering**. 42, 6195–6217. [ISSN / eISSN: 0960-3182 / 1573-1529] https://doi.org/10.1007/s10706-024-02892-4

6. **Das R**, Singh TN, **2022**. A novel technique for temporal evolution of rockburst in underground rock tunnel: an experimental study. **Environmental Earth Sciences**. 81 (17), 420. [ISSN / eISSN: 1866-6280 / 1866-6299] https://doi.org/10.1007/s12665-022-10546-y

7. **Das R**, Phukon P, Singh TN, **2021**. Understanding the cause and effect relationship of debris slides in Papumpare district, Arunachal Himalaya, India. **Natural Hazards**. 110, 1735-1760. [ISSN / eISSN: 0921-030X / 1573-0840] https://doi.org/10.1007/s11069-021-05010-2

8. **Das R**, Dhouchak R, Singh TN, **2021**. Analysis and prediction of brittle failure in rock blocks having a circular tunnel under uniaxial compression using acoustic Emission technique: laboratory testing and numerical simulation. **International Journal of Geo-Engineering**. 12, 14. [ISSN / eISSN: 2092-9196 / 2198-2783] https://doi.org/10.1186/s40703-020-00136-x

9. **Das R**, Singh, TN, **2021**. Effect of Rock Bolt Support Mechanism on Tunnel Deformation in Jointed Rockmass: A Numerical Approach. **Underground Space**. 6, 409-420. [ISSN / eISSN: 2096-2754 / 2467-9674] https://doi.org/10.1016/j.undsp.2020.06.001

10. **Das R**, Singh TN, **2020**. Effect of Closely Spaced, Non-Persistent Ubiquitous Joint on Tunnel Boundary Deformation: A Case Study from Himachal Himalaya. **Geotechnical and Geological Engineering**. 39, 2447-2459. [ISSN / eISSN: 0960-3182 / 1573-1529] https://doi.org/10.1007/s10706-020-01637-3

11. Panthee S, Singh PK, Kainthola A, **Das R**, Singh TN, **2018**. Comparative study of the deformation modulus of

rock mass - a reply to the comments received from Gokceoglu (2018). **Bulletin of Engineering Geology and the Environment**. 77, 763–766. [ISSN / eISSN: 1435-9529 / 1435-9537] https://doi.org/10.1007/s10064-018-1272-z

12. **Das R**, Singh PK, Kainthola A, Panthee S, Singh TN, **2017**. Numerical analysis of surface subsidence in asymmetric parallel highway tunnels. **Journal of Rock Mechanics and Geotechnical Engineering**. 9, 170–179. [ISSN / eISSN: 1674-7755 / 2589-0417] https://doi.org/10.1016/j.jrmge.2016.11.009

13. Guha Roy D, Singh TN, Kodikara J, **Das R**, **2017**. Effect of Water Saturation on the Fracture and Mechanical Properties of Sedimentary Rocks. **Rock Mechanics and Rock Engineering**. 50, 2585–2600. [ISSN / eISSN: 0723-2632 / 1434-453X] https://doi.org/10.1007/s00603-017-1253-8

14. Panthee S, Singh PK, Kainthola A, **Das R**, Singh TN, **2016**. Comparative study of the deformation modulus of rock mass. **Bulletin of Engineering Geology and the Environment**. 77, 751–760. [ISSN / eISSN: 1435-9529 / 1435-9537] https://doi.org/10.1007/s10064-016-0974-3

Full Articles in International Conferences

1. Mazumder D, **Das R**, Das S, **2024**. Laboratory Simulation of Rockfall Hazard in Different Sedimentary Rocks of Mizoram, India. Proceedings of the 2nd International Conference on Geotechnical Issues in Energy, Infrastructure and Disaster Management. **ICGEID 2024**. Lecture Notes in Civil Engineering, vol. 475 Springer, Singapore, 77-92, [eBook ISBN: 978-981-97-1757-6] https://doi.org/10.1007/978-981-97-1757-6_7

2. **Das R**, **2023**. Tunnelling in squeezing ground – a review on prediction and measurement of boundary deformation and available mitigation methods, in: **5th International Disaster Risk and Vulnerability Conference (DVRC 2023)**. K. R. Baiju, Karunakaran Akhildev, Joice K Joseph, Naveen Babu, Anithomas Idiculla, Asha Rose, Shibu K Mani, Mahesh Mohanand A.P. Pradeep kumar (Eds) 19 January- 21 January 2023, Mahatma Gandhi University, Kottayam, Kerela, India. [**ISBN: 978-93-80419-73-2]** https://drvcdisaster.wordpress.com/wp-content/uploads/2024/09/drvc2023_proceedings_final.pdf

3. Prasad S, **Das R**, Singh TN, **2018**. Estimation of Rock Bolt Length for a Tunnel by Numerical Modeling: A Case Study in Himalayas, Arunachal Pradesh, India, in: **ISRM International Symposium - 10th Asian Rock Mechanics Symposium, ARMS 2018. OnePetro, Z. Zhao, Y. Zhou, J. Shang (Eds)** 29 October - 3 November - 2018, Singapore. [**ISBN: 978-981-11-9003-2]** https://onepetro.org/ISRMARMS/proceedings/ARMS1018/All-ARMS1018/ISRM-ARMS10-2018-159/43325

4. **Das R**, Sharma KM, Singh TN, **2018**. Physical and Numerical Model to Investigate Shallow Tunnel Instabilities in Loose Soil, in: **International Conference on Geo-Mechanics, Geo-Energy and Geo-Resources – IC3G 2018,** Sichuan University, Chengdu, China.

5. Prasad S, **Das R**, Singh TN, Prasad R, **2018**. Geological and Geotechnical Problems Encountered during Construction of Butterfly Valve Chamber and Penstock Assembly Chamber of Tehri Pumped Storage Plant, in: **International Conference on Geo-Mechanics, Geo-Energy and Geo-Resources – IC3G 2018**, Sichuan University, Chengdu, China.

6. Prasad S, **Das R**, Singh TN, Prasad R, **2018**. Assessment Causes of Overbreak and Control Measures In Underground Tunnel during Construction - A Case Study from Central Himalayas (HP), in: **International Conference on Geo-Mechanics, Geo-Energy and Geo-Resources – IC3G 2018**, Sichuan University, Chengdu, China.

7. **Das R**, Sirdesai NN, Singh TN, **2017**. Analysis of Deformational Behavior of Circular Underground Opening in Soft Ground Using Three-Dimensional Physical Model, in: **American Rock Mechanics Association (ARMA)**

2017, 51st US Rock Mechanics / Geomechanics Symposium (5 VOLS). San Francisco, California, USA. [**ISBN: 978-15-1085-7582**] https://onepetro.org/ARMAUSRMS/proceedings/ARMA17/All-ARMA17/ARMA-2017-0172/124188

8. Singh PK, **Das R**, Singh KK, Singh TN, **2016**. Landslide in fractured and stratified rocks - A case from Aizawl, Mizoram, India, in: Proceedings of the Conference on **Recent Advances in Rock Engineering (RARE 2016), Bengaluru, India**. Atlantis Press, Paris, France, pp. 189–194. doi:10.2991/rare-16.2016.59, [**ISBN: 978-94-6252-2**] https://www.atlantis-press.com/proceedings/rare-16/25864904

Full Articles in National Conferences

1. **Das R**, Singh TN, **2017**. Numerical Modelling of Horseshoe Shaped Tunnel to Analyse the Extent and Effect of Disturbed Zone in Jointed Rockmass under Variable Joint spacing, in: **INDOROCK** 2017: 7th Indian Rock Conference. New Delhi, pp. 325–335.

2. **Das R**, Singh PK, Kainthola A, Singh TN, **2016**. Deformational Behavior of Jointed Rockmass during Tunnelling and Determination of Support System Using Finite Element Method, in: **INDOROCK** 2016: 6th Indian Rock Conference. pp. 314–333.

Abstracts / Extended Abstracts in International Conference Proceedings/Journals/Books

1. **Das R** (2025) Stress and deformational behaviour of weak jointed rock mass during tunnelling, **Journal of Rock Mechanics and Tunnelling Technology (JRMTT),** Editor: Subhash Mitra, R. K. Goel, R. D. Dwivedi, Ashok Kumar Singh. **Vol. 31, No.1**. [ISSN: 0971-9059]

2. Das S, **Das R**, Mazumder D (2024) Engineering characterisation of landslide derived material: A case study on Sonapur landslide, Meghalaya. In: **International Conference on Climate Change and Natural Resources Management for Sustainable Development (ICNS-2024),** Editors: B.P. Mishra, Santanu Ghosh, Laltanpuia Renthlei, Madhurima, Organized by School of Earth Sciences and Natural Resources Management, Mizoram University, Aizawl, Mizoram, India.

3. Mazumder D, **Das R**, Das S (2024) Understanding the multi-aspect debris characteristics of a landslide along the Lumding-Haflong road section. In: **International Conference on Climate Change and Natural Resource Management for Sustainable Development (ICNS-2024),** Editors: B.P. Mishra, Santanu Ghosh, Laltanpuia Renthlei, Madhurima, Organized by School of Earth Sciences and Natural Resources Management, Mizoram University, Aizawl, Mizoram, India.

4. Medhi D, **Das R** (2024) Rock mass characterization and classification along Guwahati Shillong national highway. In: **The 44th IIG Annual Meet and International Conference (IIG 2024): Shaping Tomorrow: Society, Culture, and the Environment in an Interconnected World**, Cotton University, Guwahati, Assam, India.

5. Das S, **Das R**, Mazumder D (2024) Simulating the effect of acid rain on the durability of limestone through accelerated weathering test. In: **The 44th IIG Annual Meet and International Conference (IIG 2024): Shaping Tomorrow: Society, Culture, and the Environment in an Interconnected World**, Cotton University, Guwahati, Assam, India.

6. Mazumder D, **Das R**, Das S (2024) Investigating physico-mechanical properties of Bhuban shale and their impact on landslides amidst rapid urbanization in Aizawl, Mizoram. In: **The 44th IIG Annual Meet and International Conference (IIG 2024): Shaping Tomorrow: Society, Culture, and the Environment in an Interconnected World**, Cotton University, Guwahati, Assam, India.

7. **Das R**, Das S, Singh TN (2023) Bedding-controlled landslide hazard in Assam Arakan Fold belt: A case study

from Aizawl, Mizoram, India. In: **1st SLRMES Conference on Rock Mechanics for Infrastructure and Geo-Resources Development - an ISRM Specialized Conference**, Colombo, Sri Lanka, pp 83-84, [**ISBN: 978-624-6506-00-1**]

8. **Das R**, Phukon P, Niyogi A (2022) Numerical Modelling Approach to Evaluate Debris Slide: A Case Study from the North East Himalaya, India. In: Ghosh S, Mandal HS (Eds) **36th International Geological Congress**, Geosciences: The Basic Science for a Sustainable Future (The Volume of Abstracts). Geological Society of India, Bengaluru, New Delhi, pp 3274–3275, [**ISBN: 978-93-80998-45-9**]

9. Niyogi A, Sarkar K, **Das R**, Singh TN (2022) Evaluation of Rockfall Risk Potential Using Rigid Body Model Along National Highway 66 Near Ratnagiri, Maharashtra, India. In: Ghosh S, Mandal HS (Eds) **36th International Geological Congress**, Geosciences: The Basic Science for a Sustainable Future (The Volume of Abstracts). Geological Society of India, Bengaluru, New Delhi, pp 3215–3216, [**ISBN: 978-93-80998-45-9**]

Awards and Achievements

- Received **International Travel Support (ITS)** award from DST-SERB, 2023.
- Awarded **Startup Research Grant (SRG)** from DST-SERB, 2022.
- Cleared **Joint CSIR-UGC NET** in **June 2020**.
- Cleared **IIT - JAM**, 2013, **ISM** 2013, and **IIT GATE GG 2015 to 2021**.
- Recipient of "Chief Minister's Scheme for **Financial Assistance** to Meritorious Student of Assam" for qualifying IIT-JAM Entrance Examination in the Year 2013.
- Recipient of "**Anundoram Borooah Award**" and "**Amul Vidyashree Award**" for excellent academic performance in Matriculation 2008.

Selected Seminars/Conferences Attended

1. **ICGEID 2024**: 2nd International Conference on Geotechnical Issues in Energy, Infrastructure and Disaster Management, IIT Patna, Bihar, India, 18-20th Jan 2024.
2. **SLRMES 2023**: 1st SLRMES Conference on Rock Mechanics for Infrastructure and Geo-Resources Development - an ISRM Specialized Conference, Colombo, Sri Lanka, 3-7th Dec 2023.
3. **DRVC 2023:** 5th International Disaster Risk and Vulnerability Conference, Kerela, India, 19-21st Jan 2023.
4. **INDOROCK 2017**: 7th Indian Rock Conference, New Delhi, India, ISRMTT, 25-27th Oct 2017.
5. **ARMA 2017**: 51st US Rock Mechanics/Geomechanics Symposium, San Francisco, California, USA, 25-28th Jun 2017.
6. **ISRM**, **Recent Advances in Rock Engineering** (**RARE-2016**) Bengaluru, India, ISRM, 16-18th Nov 2016.
7. **INDOROCK 2016**: 6th Indian Rock Conference, Mumbai, India, ISRMTT, 17-18th Jun 2016.

PhD supervision

Sl No.	Name of the Student (Enrollment No)	Thesis Title	Year of Joining	Year of completion
1	Mr. Sourav Das (GLY2391001)	Tentative Title: An experimental investigation of thermal treatment effects on the physico-mechanical properties of sandstone of Meghalaya, Northeast India	2023	--
2	Debasish Mazumder (GLY2491002)	Tentative Title: Understanding the influence of different variables on rockfall characteristics	2024	--

MSc Dissertation supervision

Sl No.	Name of the Student	Dissertation topic	Year

1	Debasish Mazumder (GLY2162019)	Simulating the rockfall hazards for different rock types of North-east India: An experimental study	2023
2	Dhritismita Medhi (GLY2162014)	Rock mass characterization and classification along Guwahati Shillong national highway	
3	Jintu Moni Nath (GLY2162012)	Evaluation of geotechnical properties of Meghalayan Khasi Greenstone (Metadolerite) for suitability as a building stone	
4	Ipshita Bezbaruah (GLY2162018)	Characterizing the physico-mechanical properties of rocks found along the Guwahati-Shillong National highway	
5	Priyom Pankhi Handique (GLY2262014)	The effect of high temperature on tensile strength of Sandstone: An experimental study	2024
6	Bishmoy Sonowal (GLY2362005)	Rock mass characterization and classification along Shillong-Dawki (NH-206) National Highway	2025
7	Chayanika Chelleng (GLY2362013)	Evaluation of strength characteristics of rocks using Block Punch Index (BPI) test	
8	Pragya Das (GLY2362014)	Time-dependent variation in the degree of saturation of rocks: A study on water absorption and desaturation behavior	
9	Prajjalita Devi (GLY2362016)	Comparison of liquid limit measurements of soil using the Casagrande method and Cone Penetrometer method	

Involved in subjects taught at Cotton University from 2021 till present are listed below

Sl No	Paper Code	Paper Title	UG/PG
1	VAC 25 E001	Environmental Studies	UG
2	GLY23C201	Fundamentals of Geology - II (Core)	UG
3	GLY23M201	Fundamentals of Geology - II (Minor)	UG
4	GLY 404E	Earth Surface Processes and Landforms	UG
5	GLY 402C	Principles of Stratigraphy & **Geological Field Work - I**	UG
6	GLY 504E (DSE-2)	Prospecting and **Mining Geology**	UG
7	GLY 502C	Hydrogeology and **Engineering Geology**	UG
8	GLY 603E (DSE-3)	River Science and River Science Practical	UG
9	GLY 604 (DSE-4)	Environmental Geology + **Geological Field Work – II + Group Discussion**	UG
10	GLY 703C	Geomorphology and Quaternary Geology	PG
11	GLY 705 (LAB -1)	Geomorphology and Quaternary Geology Practical	PG
12	GLY 904 (SPL)	Geoexploration and **Mining Geology**	PG
13	GLY 1002C (SPL II)	Statistics in Geology and **Engineering Geology**	PG
14	GLY 1004 (DPW)	Project Work + Geological Field Work – II	PG

Faculty induction / Orientation programme / Refresher course completed

1. Completed 4-week Faculty Induction/Orientation Programme from Teaching Learning Centre, Ramanujan College, University of Delhi under the aegis of Ministry of Education, Government of India, PMMMNMTT Scheme (17 Sept - 16 Oct 2021)
2. Completed 1-month Faculty Induction Programme (FIP) from UGC – Human Resource Development Centre, University of Allahabad (7 Nov - 6 Dec 2022)
3. Completed 2-week Refresher course in Earth Sciences and Allied Subjects (Multidisciplinary) of UGC-Human Resource Development Centre, NEHU, Shillong (19 Feb - 02 Mar 2024)