

Dr. Sayantan Ganguly

Assistant Professor

Department of Civil Engineering

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Research Interests: Hydrogeology, Flow through porous media, Water Resources, Heat transport in porous media, Geothermal Energy, Aquifer Thermal Energy Storage (ATES) systems, Renewable Energy systems.

Educational Qualifications	Year	Board/Institution	CGPA/%
PhD	2015	Indian Institute of Science, Bangalore, India	By Research
Postgraduate (M. Tech.)	2009	Indian Institute of Technology, Roorkee, India and University of Stuttgart, Germany	9.27(10)
Undergraduate (B.E)	2007	Jadavpur University, Kolkata, India	8.36(10)
Twelfth Class	2003	Jadavpur Vidyapith, Kolkata, India	85.10%
Tenth Class	2001	Jadavpur Vidyapith, Kolkata, India	89.25%

Awards and Achievements (Academic):

1. **Fellowship** from **International Geothermal Association (IGA)** to attend the **“World Geothermal Congress 2020”** in Reykjavik, Iceland.

2. **Start-up Research Grant (SRG)** (2019) from Science and Engineering Research Board (SERB), Department of Science and Technology (DST). Govt. of India.
3. **Post-Doctoral Fellowship** (2016) from **Utrecht University**, the Netherlands.
4. **Endeavour Post-Doctoral Research Fellowship 2016**, to carry out Post-Doctoral research in **RMIT University**, Melbourne, Australia
5. **DAAD scholarship**-“Short term Scholarships for PhD Registered Scholars/ M. Phil (German Studies)” to visit **University of Stuttgart**, Germany as a visiting research scholar (Aug 2012 to Oct 2012).
6. **DAAD scholarship**-“Sandwich Model Scholarships for Masters Students of IITs” to visit **University of Stuttgart**, Germany for the M. Tech dissertation research (Sept 2008 to May 2009).
7. **Jalvigyan Puraskar** (2013) - **Best Paper award** in the ISH journal of Hydraulic Engineering, Indian Society for Hydraulics
8. **Fellowship** from **International Geothermal Association** (IGA) to attend the “**World Geothermal Congress 2015**” in Melbourne, Australia; 19th -24th Apr 2015.
9. **Publons peer review award 2018** for placing in the top 1% reviewers in the field of Engineering.
10. **Outstanding reviewer recognitions** from ‘Applied Energy’, ‘Energy Conversion and Management’, ‘Solar Energy’, ‘Applied Thermal Engineering’ and ‘International Journal of Sediment Research’ journals.
11. **Best Paper Award** in the conference proceedings of 9th International Symposium on Lowland Technology, 2014 in Saga, Japan, given by **International Association of Lowland Technology** (IALT).
12. **Travel grant** from Department of Hydromechanics and Modeling of Hydrosystems, University of Stuttgart, Germany to attend the short course on “**Multiphase Flow, Transport and Bioprocesses in Porous Media**” Oct 4-8, 2010, University of Stuttgart, Germany.
13. **International Students Travel grant** from University of Stuttgart, Germany to attend the conference ‘Computational Methods in Water Resources’ 2014, University of Stuttgart, Germany.
14. **Best Presentation award (2nd Prize)** in Sixth Annual Students’ Symposium. Civil Engineering Department. Indian Institute of Science, Bangalore. Sept 2013.

15. Received MHRD (Govt. of India) scholarship to pursue PhD studies.
16. Received MHRD (Govt. of India) scholarship to pursue M. Tech. studies through GATE Examination.
17. **Highest CGPA** in M. Tech. specialization of Hydraulic Engineering (9.27/10).
18. Master's degree with **first class honours**.
19. Bachelor's degree in Civil Engineering with **first class honours**.

Work Experience:	1.	Assistant Professor. Department of Civil Engineering. Indian Institute of Technology Ropar, India. (Nov 2018-present)
	2.	Post-Doctoral Fellow in Environmental Hydrogeology group, Department of Earth Sciences, Utrecht University, the Netherlands (Nov 2016 – Oct 2018)
	3.	Endeavour Post-Doctoral Fellow in School of Aerospace, Mechanical and Manufacturing Engineering, RMIT University, Melbourne, Australia (Apr 2016-Sept 2016)
	4.	Post-Doctoral Research Associate in Divecha Centre for Climate Change, Indian Institute of Science, Bangalore. (27 th Oct 2014 – 18 th Apr 2016).
	5.	Institute Research Associate in Department Civil Engineering, Indian Institute of Science, Bangalore. (27 th Jul 2014 to 26 th Oct 2014 – 3 months).
	6.	Guest Lecturer. Masters Course 'Environmental hydrogeology'. Department of Earth Sciences, Utrecht University.
	7.	Guest Lecturer. Undergraduate Course 'Water in Geo-processes'. Department of Earth Sciences, Utrecht University.

Teaching

1. Engineering Drawing (GE105: UG)
 2. Groundwater Engineering (CEL461: UG + PhD)
 3. Fundamentals of Fluid Mechanics (CE202: UG)
 4. Advanced Fluid Mechanics (CE502: PG + PhD)
 5. Pipe and Open Channel Hydraulics (CE302: UG)
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Sponsored Research Projects				
Sl. No.	Project Title	Funding body	Role	Status
1.	A feasibility study on aquifer storage of water by artificial recharge in and around Punjab region, India	Science and Engineering Research Board (SERB), Department of Science and Technology (DST), Govt. of India	PI	Ongoing
2.	Experiments and simulations on the feasibility of aquifer storage and recovery by artificial recharge	ISIRD grant, IIT Ropar	PI	Ongoing

Consultancy Projects				
Sl. No.	Project Title	Funding body	Role	Status
1.	Design of a sustainable storm Water drainage (SWD) system for Patiala city, Punjab	Municipal Corporation, Patiala, Punjab, India	Joint-CI	Completed
2.	Design of a lift irrigation scheme at Changer area, Punjab	Ropar Headworks, Punjab	Joint-CI	Ongoing
3.	Preparation of State Specific Action Plan (SSAP) on water sector of Punjab state, India	Water Resources Dept., Govt. of Punjab under National Water Plan	Joint-CI	Sanctioned
4.	Preparation of State Specific Action Plan (SSAP) on water sector of Haryana state, India	Water Resources Dept., Govt. of Haryana (HIRMI) under National Water Plan	Lead and CI	Ongoing

Workshops/Invited Seminars/Symposium talks				
Sl. No.	Workshop/Seminar title	Date	Venue	Talk title
1.	SVJN Hydropower Workshop	13 th Sep 2021	IIT Ropar	Theory and computations of sediment settlement in reservoirs and its effect on hydropower production
2.	Geothermal Issues and Challenges	1 st Jun 2014	IISc Bangalore	Modeling for heat transport in a geothermal reservoir due to cold-water injection

Supervision				
Ph.D.				
Sl.	Name	Department/ project	Status	Topic of Research (projected/final)
1.	Shreya Ganguly	Civil Engg.	Ongoing	Hydrogeology and environmental aspects of aquifer storage and recovery of water
2.	Priyanka (jointly with Dr. R.K. Tiwari)	Civil Engg.	Ongoing	Modeling of urban heat island
3.	Rohtash Goswami (Jointly with Dr. Ranjan Das)	Mechanical Engg.	Ongoing	Thermoelectric power generation using solar pond and biomass energy as a heat source
4.	Dolon Banerjee	Civil Engg.	Ongoing	Quantifying Ground-Water and Surface-Water Interaction
5.	Thallam Prashanth	Civil Engg. SERB –SRG Project	Ongoing	SERB project – “A feasibility study on aquifer storage of water by artificial recharge in and around Punjab region, India”
M.Tech.				
6.	Akash Bajpai (jointly with Dr I Sonkar)	Civil Engg.	Completed	Dam break analysis using HEC-RAS model

7.	Sakshi Agarwal	Civil Engg.	Ongoing	Modeling flow and transport for aquifer storage and recovery
8.	Dharmendra Shukla	Civil Engg	Ongoing	Artificial recharge in aquifers.
Project Fellows				
9.	Ankush Kaundal	SERB-SRG Project	Discontinued	SERB project – “A feasibility study on aquifer storage of water by artificial recharge in and around Punjab region, India”
B.Tech.				
10.	Capstone Project (AY 2020-2021)	Civil Engg.	Completed	Design of a sustainable storm water drainage system for a city in India
Internships				
11.	Rohitash Phardoliya	SERB project	Completed	SERB project – “A feasibility study on aquifer storage of water by artificial recharge in and around Punjab region, India”

Other Professional Duties	
1.	Doctoral committee member of PhD students (Civil Engineering Dept., HSS, IIT Ropar)
2.	Program Coordinator for M.Tech-Water Resources and Environment. Civil Engg. Dept.
3.	Faculty advisor (M.Tech. in Water Resources and Environment, 2019-2021 batch, IIT Ropar)
4.	Drafting committee member (M.Tech. program in Water Resources and Environment, IIT Ropar)
5.	Member of the committee from Civil Engineering, IIT Ropar-Masters students exchange program between French Engineering Schools and IITs.
6.	Member of the Horticulture Work Committee, IIT Ropar.

<u>Publications</u>	
Total citations: 242; h-index: 10; i10-index: 10 (Source: Google scholar)	
<u>General Articles</u>	
1.	Ganguly S. Subsurface storage of water - what, why and how? <i>Resonance:</i>

	<i>Journal of Science Education</i> . 2020 (Accepted for Publication).
<u>Peer Reviewed Journals</u>	
<u>2021</u>	
18.	Ganguly S and Ganguly S . A Review on the Implementation of Managed Aquifer Recharge Techniques in India. <i>Current Science</i> . Vol. 121(5), Sep 2021. pp. 641-650.
<u>2019</u>	
17.	Ganguly S , A Date, and A Akbarzadeh. On increasing the thermal mass of a salinity gradient solar pond with external heat addition: a transient study. <i>Energy</i> (Elsevier). Vol. 168, Feb 2019. pp. 43-56.
<u>2018</u>	
16.	Ganguly S , Exact solution of heat transport equation for a heterogeneous geothermal reservoir. <i>Energies</i> (MDPI). Vol. 11 (11), Nov 2018. pp. 2935.
15.	Ganguly S , A Date, and A Akbarzadeh. Effectiveness of bottom insulation of a salinity gradient solar pond. <i>Journal of Solar Energy Engineering</i> (ASME) Vol. 140 (4). Mar 2018. pp. 1-5. (In the list of 'popular contents' of the journal Mar-Apr 2018).
14.	Ganguly S , A Date, and A Akbarzadeh. Investigation of thermal performance of a solar pond with external heat addition. <i>Journal of Solar Energy Engineering</i> (ASME) Vol. 140 (2). Jan 2018. pp. 1-6. (In the list of popular contents of the journal in Feb-Mar 2018).
<u>2017</u>	
13.	Ganguly S , A Date, and A Akbarzadeh. Heat recovery from ground below the solar pond. <i>Solar Energy</i> (Elsevier). Jul 2017. Vol. 155, Oct 2017, pp. 1254–1260.
12.	L Tan, A Date, B Singh, S Ganguly . A comparative case study of remote area power supply systems using photovoltaic-battery vs. thermoelectric-battery configuration. <i>Energy Procedia</i> (Elsevier). Vol. 110, Mar 2017. pp. 89-94.
11.	L Tan, A Date, G Fernandes, B Singh, S Ganguly . Efficiency gains of photovoltaic system using latent heat thermal energy storage. <i>Energy Procedia</i> (Elsevier). Vol. 110. Mar 2017. pp. 83-88.
10.	Ganguly S , L Tan, A Date, MS Mohan Kumar. Effect of heat loss in a geothermal reservoir. <i>Energy Procedia</i> (Elsevier). Vol. 110. Mar 2017. pp. 77-82.
9.	Ganguly S , L Tan, A Date, MS Mohan Kumar. Numerical investigation of temperature distribution in a confined heterogeneous geothermal reservoir due to injection-production. <i>Energy Procedia</i> (Elsevier). Vol. 110(C). Mar 2017. pp.

	143-148.
8.	Ganguly S , MS Mohan Kumar, A Date and A Akbarzadeh. Numerical investigation of temperature distribution and thermal performance while charging-discharging thermal energy in aquifer. <i>Applied Thermal Engineering</i> (Elsevier). Vol. 115, Mar 2017. pp. 756-773.
7.	Ganguly S , R Jain, A Date, and A Akbarzadeh. On the addition of heat to solar ponds from external sources. <i>Solar Energy</i> (Elsevier). Vol. 144. Mar 2017. pp. 111-116.
2015	
6.	Ganguly S and MS Mohan Kumar. A numerical model for transient temperature distribution in an Aquifer thermal energy storage system with multiple wells. <i>Lowland Technology International</i> (IALT). Vol. 17 (3). Dec 2015. pp. 179-188.
2014	
5.	Ganguly S and M. S. Mohan Kumar. Analytical solutions for transient temperature distribution in a geothermal reservoir due to cold water injection. <i>Hydrogeology Journal</i> (Springer) Vol 22 (2), Mar 2014, pp. 351-369.
4.	Ganguly S and M. S. Mohan Kumar. Analytical solutions for movement of cold-water thermal front in a heterogeneous geothermal reservoir. <i>Applied Mathematical Modelling</i> (Elsevier). Vol. 38 (2), Jan 2014, pp. 451-463.
2013	
3.	Ganguly S , N. Seetha and M. S. Mohan Kumar. Numerical modeling and analytical validation for the movement of thermal front in a heterogeneous aquifer thermal energy storage system. <i>International Journal of Numerical Analysis & Modeling, Series B</i> . Vol. 4 (4). Nov 2013. pp. 413-424.
2012	
2.	Pradeep S, G Sayantan , P.G. Prasad, M.S. Mohan Kumar. CFD simulation and experimental validation of a horizontal pump intake system. <i>ISH Journal of Hydraulic Engineering</i> . Indian Society for Hydraulics (Taylor and Francis). Vol.18 (3), Sept 2012, pp. 173-185. (In the list of 'Most Read Articles' of the journal).
1.	Ganguly S and M. S. Mohan Kumar. Geothermal reservoirs-A brief review. <i>Journal of Geological Society of India</i> (Springer), Vol.79 (6), Jun 2012, pp. 589-602.
Peer Reviewed International Conferences/Symposiums	

1.	Ganguly S , N. Seetha, MS Mohan Kumar. Numerical simulation and analytical validation for transient temperature distribution in an aquifer thermal energy storage system. Proceedings of 8 th <i>International Symposium on Lowland Technology</i> . Bali, Indonesia, Sept 2012.
2.	Ganguly S and MS. Mohan Kumar. Numerical modeling and analytical validation for the movement of thermal front in a heterogeneous aquifer thermal storage system. Abstract and presentation in the Indo-German conference on <i>Modeling, Simulation and Optimization in Applications</i> . TU Darmstadt, Germany, Sept 2012.
3.	Ganguly S and MS Mohan Kumar. Numerical modeling for transient temperature distribution in an aquifer thermal energy storage system. Proceedings of: <i>HYDRO 2013 International</i> . Indian Institute of Technology, Madras, India. Dec 2013.
4.	Ganguly S and MS Mohan Kumar. Numerical modeling for transient temperature distribution in an aquifer thermal energy storage system. Abstract & presentation at <i>Computational Methods in Water Resources (CMWR) XX 2014</i> , University of Stuttgart, Germany, June 2014.
5.	Ganguly S and MS Mohan Kumar. Numerical model of an aquifer thermal energy storage system with multiple Wells. 9 th <i>International Symposium on Lowland Technology</i> . Saga, Japan, Sept 29-Oct 1, 2014.
6.	A Date, M Ahmadi, A Akbarzadeh, Ganguly S , MS Mohan Kumar. Experimental performance investigation and case study of combined desalination and power generation using geothermal energy. <i>World Geothermal Congress 2015</i> . Melbourne, Australia, Apr 2015.
7.	Ganguly S , MS Mohan Kumar, A Date, A Akbarzadeh. Numerical modeling and analytical validation for transient temperature distribution in a heterogeneous geothermal reservoir due to cold water Injection. <i>World Geothermal Congress 2015</i> . Melbourne, Australia, Apr 2015.
8.	Ganguly S , L Tan, A Date, MS Mohan Kumar. Temperature distribution in a confined heterogeneous geothermal reservoir due to injection-production. Poster presentation. <i>International Conference on Energy and Power (ICEP)</i> , RMIT University, Melbourne, Australia, Dec 2016.
9.	Ganguly S , L Tan, A Date, MS Mohan Kumar. Effect of heat loss in a geothermal reservoir and parameters influencing it. Abstract and poster presentation. <i>International Conference on Energy and Power (ICEP)</i> , RMIT University, Melbourne, Australia, Dec 2016.
10.	L Tan, A Date, G Fernandes, B Singh, Ganguly S . Efficiency gains of photovoltaic system using latent heat thermal energy storage. Abstract and poster presentation. <i>International Conference on Energy and Power (ICEP)</i> , RMIT University, Melbourne, Australia. Dec 2016.

11.	L Tan, A Date, B Singh, Ganguly S. A comparative case study of remote area power supply systems using photovoltaic-battery vs. thermoelectric-battery configuration. Poster Presentation. <i>International Conference on Energy and Power (ICEP)</i> , Dec 2016, RMIT University, Melbourne, Australia.
12.	Ganguly S. Temperature distribution and thermal performance of an aquifer thermal energy storage system. Abstract and poster presentation in <i>European Geosciences Union (EGU) General Assembly</i> . Vienna. Apr 2017.
13.	Ganguly S. Thermal performance of an aquifer while charging-discharging thermal energy. Abstract in 9 th <i>International Conference on Porous Media & Annual Meeting, InterPore</i> (International Society for Porous Media). Rotterdam, The Netherlands, May 2017.
14.	Ganguly S , Schotting Ruud J., Raoof A. High-resolution visualization of free surface flow-porous media flow interaction using micromodel. Abstract and poster presentation at 2 nd <i>SRP-NUPUS Meeting</i> , Mühlhausen im Täle, Germany, Oct 2017.
15.	Ganguly S , J. H. van Lopik, R J Schotting, G Yuce. Mathematical model of fast high-volume infiltration into subsurface. Abstract & presentation Computational Methods in Water Resources (CMWR) XXII. Saint-Malo, France, June 2018.
16.	Ganguly S , H. Puppala. Investigation of the Potential and Thermal Performance of a Proposed Aquifer Thermal Energy Storage System at Ropar, India. World Geothermal Congress 2020+1, Reykjavik, Iceland (May 2021).
17.	Prashanth T, Ganguly S. Hydrological modeling for Sutlej basin using SWAT. Hydro 2021 International, SVNIT Surat, India. (To be held in Dec 2021: Abstract accepted, paper submitted).
18.	Ganguly S and Ganguly S. Numerical modelling of transport and fate of Chromium (VI) in sub-surface porous media. Hydro 2021 International, SVNIT Surat, India. (To be held in Dec 2021: Abstract accepted, paper submitted).

Professional Services

Editorial role

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| 1. | Review Editor: Frontiers in Water: Water and Climate |
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Reviewer for International Journals

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| 1. | Water Resources Research (AGU). |
| 2. | Energy Conversion and Management (Elsevier) |

3.	Solar Energy (Elsevier)
4.	Applied Energy. (Elsevier)
5.	Science of the Total Environment. (Elsevier)
6.	Energies (MDPI)
7.	Renewable Energy (Elsevier)
8.	Applied Thermal Engineering (Elsevier)
9.	Journal of Solar Energy Engineering (ASME)
10.	International Journal of Sediment Research (Elsevier)
11.	Fluids (MDPI)
12.	Geosciences. (MDPI)
13.	Current Science (Indian Academy of Sciences)
14.	Journal of Energy Storage (Elsevier)
15.	Sustainable Energy Technologies and Assessment (Elsevier)
16.	Energy and Built Environment (KeAi)
17.	Journal of Building Engineering (Elsevier)
18.	Materials Today: Proceedings
Reviewer/Evaluator of scientific/professional projects	
1.	Reviewer for scientific project from Sultan Qaboos University, Oman

Personal Details

Date of Birth: 02-05-1984 **Gender:** Male **Marital status:** married

Current address: Civil Engineering Department (Room 338), Transit Campus, Indian Institute of Technology Ropar, Nangal Road, Rupnagar, Punjab 140001.

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