

RENU V
 Assistant Professor
 Department of Civil Engineering
 Indian Institute of Technology (Indian School of Mines) Dhanbad



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<https://scholar.google.com/citations?user=GzRbaJQAAAAJ&hl=en>
 Researchgate profile: https://www.researchgate.net/profile/Renu_Valsala

Research Interest

- Groundwater Flow in Porous and Fractured Rock aquifers
- Contaminant Transport Modeling in Subsurface Systems
- Onshore oil spill modeling
- Hydrogeochemical Transport Mechanisms
- Numerical Modeling Techniques
- Mine water planning and management

Research and Teaching Experience

Degree/ Qualifying Exam	Institute/University	Duration	CGPA/Percentage
Doctor of Philosophy (Ph.D.) Thesis Title: Numerical modeling on transport of petroleum hydrocarbons in saturated subsurface systems. Guide: Prof. G. Suresh Kumar	Indian Institute of Technology Madras (Department of Ocean Engineering, Petroleum Engineering Program)	Jul 2013 – Jan 2019	9.6/10
Master of Technology (M.Tech.) Specialization: Hydraulics and Water Resources Engineering Thesis Title: Numerical modeling of solute transport through fractures with fracture-skin.	Indian Institute of Technology Madras , (Department of Civil Engineering)	Aug 2007 - Jul 2009	9/10
Bachelor of Technology (B. Tech.) Specialization: Civil Engineering	College of Engineering Trivandrum, University of Kerala	Aug 2003 – May 2007	8.11/10
Higher Secondary Examination	Cottonhill government model girls’ higher secondary school, Thiruvananthapuram, Kerala	Aug 2001-May 2003	89%
Secondary School Leaving Certificate	Pattom government model girls’ higher secondary school, Thiruvananthapuram, Kerala	Jun 2000 - May 2001	93 %

Position	Duration	Responsibility																			
Assistant Professor, Department of Civil Engineering, IIT (ISM) Dhanbad	25/09/2019 – till date	<table border="1"> <thead> <tr> <th>Course</th> <th>Semester</th> <th>Class strength</th> </tr> </thead> <tbody> <tr> <td>Flow and Transport Through Porous Media</td> <td>Monsoon 22-23</td> <td>11</td> </tr> <tr> <td>Hydrogeology and Well Hydraulics</td> <td>Winter 21-22</td> <td>11</td> </tr> <tr> <td rowspan="2">Environmental Engineering</td> <td>Monsoon 21-22</td> <td>57</td> </tr> <tr> <td>Monsoon 20-21</td> <td>50</td> </tr> <tr> <td rowspan="2">Environmental Engineering Laboratory</td> <td>Monsoon 21-22</td> <td>57</td> </tr> <tr> <td>Monsoon 20-21</td> <td>50</td> </tr> </tbody> </table>	Course	Semester	Class strength	Flow and Transport Through Porous Media	Monsoon 22-23	11	Hydrogeology and Well Hydraulics	Winter 21-22	11	Environmental Engineering	Monsoon 21-22	57	Monsoon 20-21	50	Environmental Engineering Laboratory	Monsoon 21-22	57	Monsoon 20-21	50
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Visiting Assistant Professor Department of Civil Engineering, IIT (ISM) Dhanbad	25/06/2019- 24/09/2019	<table border="1"> <tbody> <tr> <td rowspan="2">Hydrology and Hydraulic Structures</td> <td>Winter 20-21</td> <td>50</td> </tr> <tr> <td>Engineering Graphics</td> <td> <table border="1"> <tbody> <tr> <td>Winter 21-22</td> <td>545</td> </tr> <tr> <td>Monsoon 21-22</td> <td>545</td> </tr> <tr> <td>Winter 20-21</td> <td>525</td> </tr> <tr> <td>Monsoon 20-21</td> <td>525</td> </tr> <tr> <td>Winter 19-20</td> <td>480</td> </tr> <tr> <td>Monsoon 19-20</td> <td>480</td> </tr> </tbody> </table> </td> </tr> </tbody> </table>	Hydrology and Hydraulic Structures	Winter 20-21	50	Engineering Graphics	<table border="1"> <tbody> <tr> <td>Winter 21-22</td> <td>545</td> </tr> <tr> <td>Monsoon 21-22</td> <td>545</td> </tr> <tr> <td>Winter 20-21</td> <td>525</td> </tr> <tr> <td>Monsoon 20-21</td> <td>525</td> </tr> <tr> <td>Winter 19-20</td> <td>480</td> </tr> <tr> <td>Monsoon 19-20</td> <td>480</td> </tr> </tbody> </table>	Winter 21-22	545	Monsoon 21-22	545	Winter 20-21	525	Monsoon 20-21	525	Winter 19-20	480	Monsoon 19-20	480		
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Research and Teaching Assistant Department of Ocean Engineering, IIT Madras	Jul 2013 – Jan 2019	<ul style="list-style-type: none"> Research assistantship in projects related to Onshore oil spill Teaching assistantship in the following post graduate courses: Reservoir Engineering, Reservoir Simulation, Applied Hydrodynamics in Ocean and Petroleum Engineering, Enhanced Oil Recovery 																			
		<ul style="list-style-type: none"> Teaching assistantship in the following post graduate courses: Applied Hydraulic Engineering, Hydraulic Engineering Laboratory, Groundwater Engineering, Contaminant Transport Modeling 																			
Teaching Assistant Department of Civil Engineering, IIT Madras	Aug 2007 – Jan 2009	Teaching assistantship in following post graduate courses: Applied Hydraulic Engineering, Hydraulic Engineering Laboratory, Groundwater Engineering, Contaminant Transport Modeling																			
Summer Training, National Centre for Earth Science Studies (CESS, Trivandrum)	May 2008 - July 2008	Worked in project titled GIS based design of rain harvesting systems in Kerala																			

Industry Experience

Position	Duration	Responsibility
Product Engineer, Desalination Product Group, Boiler Auxiliaries Plant, Bharat Heavy Electricals Limited (BHEL)	Aug 2010– July 2013	<ul style="list-style-type: none"> Worked as an engineer in the Desalination Product Group of Engineering Department. Underwent on job training for an initial period of one year. The training included visit to various power plants in the country, lectures on the planning and execution of projects, management and leadership classes and interaction sessions with customers

Engineer Trainee, Desalination Product Group, Boiler Auxiliaries Plant, Bharat Heavy Electricals Limited (BHEL)	Jan 2009 – Aug 2010	of BHEL. <ul style="list-style-type: none"> • Worked as contract engineer for a period of one and half year. Responsibilities included the design of alignment of water treatment plant, water tanks and pipe distribution systems. • Worked in the proposal group for two years. Involved in the tender preparations for the proposed water treatment plants.
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Administrative Responsibilities

- Chief Warden, Ruby & Rosaline hostel, IIT(ISM) Dhanbad (July 2022-till date)
- Warden, Ruby & Rosaline hostel, IIT(ISM) Dhanbad (July 2020- June 2022)
- Co-coordinator, Water Science and Technology Division, Centre for Water Resources Management, IIT(ISM) Dhanbad
- Department coordinator for NABL accreditation, Department of Civil Engineering, IIT(ISM) Dhanbad.
- Faculty in charge, Fluid Mechanics Laboratory, Department of Civil Engineering, IIT (ISM) Dhanbad
- Faculty in Charge Placement, Department of Civil Engineering
- Member of Department Advisory Committee, Department of Civil Engineering, IIT(ISM) Dhanbad, IIT(ISM) Dhanbad.
- Treasurer, Faculty in Charge, Civil Engineering Association

Research Publications

Publications in International Journals

1. Renu Valsala, and Suresh Kumar Govindarajan. "Numerical Modeling of Colloid-assisted Btex Transport In a Saturated Fractured Aquifer." *Environmental earth sciences*, 2022; 81(2) 37. doi: [10.1007/s12665-021-10161-3](https://doi.org/10.1007/s12665-021-10161-3)
2. Wagh P, Sojan J M, Babu S J, Valsala R, Bhatia S, Srivastav R. Indicative Lake Water Quality Assessment Using Remote Sensing Images-Effect of COVID-19 Lockdown. *Water* 2021; 13:73.
3. Renu V, Suresh Kumar G. Co-colloidal BTEX and Microbial transport in a Saturated Porous System: Numerical Modeling and Sensitivity Analysis. *Transport in Porous Media*. 2019; 127 (2): 269-294. DOI: 10.1007/s11242-018-1191-2.
4. Renu V, Suresh Kumar G. Mathematical modeling on mobility and spreading of BTEX in a discretely fractured aquifer system under the coupled effect of dissolution, sorption, and biodegradation. *Transport in Porous Media*. 2018; 123 (2): 421-452. DOI: 10.1007/s11242-018-1049-7.
5. Renu V, Suresh Kumar G. Multispecies transport modeling on biodegradation of Benzene, Toluene and Xylene in a saturated fracture-matrix system with multiple electron acceptors. *Environmental Engineering Science*. 2018; DOI:10.1089/ees.2017.316. (Impact Factor:1.907)
6. Renu V, Suresh Kumar G. Interaction of dissolution, sorption and biodegradation on transport of BTEX in a saturated groundwater system: numerical modeling and spatial moment analysis. *Journal of Earth System Science*. 2018; 127:53.
7. Renu V, Suresh Kumar G. Multi-component transport of BTX in a discretely fractured aquifer with fracture-skin: numerical investigation and sensitivity analysis. *Environmental Earth Sciences*. 2017; 76(17): 1-15. DOI:10.1007/s12665-017-6956-3.
8. Renu V, Suresh Kumar G. Benzene Dissolution and Transport in a Saturated Sinusoidal Fracture

with non-uniform Flow: Numerical Investigation and Sensitivity Analysis. *Environmental Processes*. 2017; 4(3):587-601. DOI: 10.1007/s40710-017-0252-9.

9. Renu V, Suresh Kumar G. Numerical modeling on benzene dissolution into groundwater and transport of dissolved benzene in a saturated fracture-matrix system. *Environmental Processes*. 2016; 3(4):781-802. DOI: 10.1007/s40710-016-0166-y.
10. Renu V, Suresh Kumar G. Temporal moment analysis of multi-species radionuclide transport in a coupled fracture-skin-matrix system with a variable fracture aperture. *Environmental Modeling & Assessment*. 2016; 21(4): 547-562. DOI: 10.1007/s10666-016-9515-5.
11. Renu V, Suresh Kumar G. Temporal Moment Analysis of Solute Transport in a Coupled Fracture-Skin-Matrix System. *Sadhana - Academy proceedings in Engineering Sciences*. 2014; 39(2): 487-509.
12. Renu V, Suresh Kumar G. Numerical modeling and spatial moment analysis of solute mobility and spreading in a coupled fracture-skin-matrix system. *Geotechnical and Geological Engineering*. 2012; 30(6): 1289-1302. DOI: 10.1007/s10706-012-9540-3.

International Conferences

1. Renu V, Suresh Kumar G. Sensitivity analysis of higher order spatial moments for a coupled fracture-skin-matrix system. Third International Perspective on Current and Future State of Water Resources and the Environment. Jan 5-7, 2010, held at IIT-Madras.
2. Renu V, Suresh Kumar G. Numerical Modeling on Two-Phase Fluid Flow in a Coupled Fracture-Skin-Matrix System. AGU Fall Meeting held at San Francisco between 14th and 18th Dec 2015. Abstract ID: 69054, Paper Number: H54F-05.
3. Renu V, Suresh Kumar G. Numerical Modeling on Fate and Migration of BTEX dissolving from a Residual Source Zone within a Saturated Groundwater System. 7th International Groundwater Conference (IGWC-2017) on Groundwater Vision 2030 – “Water Security, Challenges & Climate Change Adaption” (Theme: 6 & Technical Session: 10) held at New Delhi-India during 11-13 Dec2017.
4. Renu V, Suresh Kumar G. Modeling Investigations on Sorption of Petroleum Hydrocarbons to Clay Minerals in a Saturated Porous Aquifer. Proceedings of the Fourth International Conference in Ocean Engineering (ICOE2018) Part of the Lecture Notes in Civil Engineering book series (LNCE, volume 22), 2019.

Research Projects

- Hydrogeochemical Modeling to Investigate Acid Mine Drainage in Fractured Aquifer System sanctioned 9.5 lakhs under Faculty Research Scheme IIT (ISM) Dhanbad. Status – ongoing.
- Scientific study on stability of proposed diversion of Bokkalavagu nallah over goaved out Longwall Panels of GDK-10 Incline on the surface and assessment of Impact of blasting in RG OCP-I on embankment of proposed diversion nallah and assessment of water danger to Adriyala Longwall Project, RG OCP-I Expansion. Sanctioned amount: Rs. 9,73,500/-. Funded by: The Singareni Collieries Company Limited. Role: Co-PI, Status - ongoing

- Identification of suitable sites and designing of environmental friendly rainwater harvesting structures for catching the rain where it falls when it falls in the IIT(ISM) campus area. Funded by: IIT (ISM) Dhanbad. Sanctioned amount: Rs. 8,80,000/- Funded by IIT (ISM) Dhanbad. Role: Co-PI, Status- ongoing
- Delineation of the Administrative Boundary of the Banki River, Garhwa District, Jharkhand: An Implication on Restoration and Conservation of the Ganga River Basin. Funded by: IIT (ISM) Dhanbad. Sanctioned amount: Rs. 21,00,000/- Role: PI, Status- ongoing

Thesis Guidance

Ph.D.

- Mr. Gautam Roy, Pursuing Ph.D. since August 2019, Ph.D. topic: Numerical modeling of Acid Mine Drainage generation and associated heavy metal transport in aquifers.
- Ms. Akanksha Srivastava, Pursuing Ph.D. since August 2020, Ph.D. topic: Bioremediation of petroleum hydrocarbons in groundwater aquifer systems.
- Mr. Manjay Kumble, Pursuing Ph.D. since August 2021. Topic: Numerical modeling to investigate the effect of microplastics on the transport of organic compounds in aquifers.

M.Tech.

- Mr. Janmay Jay Gautam, Pursuing M.Tech. Topic: Bioremediation of Landfill Leachate

B.Tech.

- Mr. Deepak Deepansh Srivastav, Mr. Gangishetti Srihit, Mr. Gaurav Khetan, Topic: Arsenic transport modeling in Aquifers. (Status Completed)
- Mr. Arsh Singh, Mr. Rohit Kumar, Topic: Trend analysis of groundwater depletion in regions of Haryana. (Status: Completed)
- Mr. Abhishek Kumar, T.M.P. Harshita, Topic: Numerical modeling of groundwater flow in aquifers. (Status: Ongoing)

Awards and Achievements

- MHRD Scholarship (July 2013-July 2018) for pursuing Ph.D. at Indian IIT Madras
- MHRD Scholarship (August 2007-July 2009) for pursuing M.Tech at Indian IIT Madras
- Secured 253rd rank in All India Graduate Aptitude Test Examination (GATE) in 2007.
- Stood in top 1% in class in M.Tech program at IIT Madras.
- Stood in top 10 % in class in B.Tech program.

Computing Skills

Programming Languages:

C/C++ Computing Languages:

MATLAB,
Technical Packages: EPANET, AutoCAD 2011
Others: ORIGIN 7.0

Personal Details

Date of Birth	:21 October 1985
Age	:36 years
Marital Status	:Married
Languages Known	:Malayalam (mother tongue), English, Hindi
Present Address	:Old D-33, Teachers Colony, IIT (ISM) Dhanbad, Dhanbad, India, Pin:826004
Permanent Address	:Saras, Thekkummoodu, Vanchiyoor P.O, Thiruvananthapuram, Pin: 695035Kerala

Reference

1. Prof. G. Suresh Kumar
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3. Prof. S. Surendran
(Retd. Professor, Department of Ocean Engineering, IIT Madras)
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Naval Architecture & Ship Building Engineering
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