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Indian Institute of Technology Madras  
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CURRENT POSITION	Junior Research Fellow Department of Applied mechanics and Biomedical Engineering Indian Institute of Technology Madras	June 2025 – present
RESEARCH INTERESTS	Material science, Geomaterials, Material characterization, Constitutive modelling, Plasticity, Damage mechanics, Ice mechanics, Finite element methods, Glacial Lake outburst floods, Geotechnical investigations.	
SKILLS	Split Hopkinson pressure bar, UTM, Extruder, Injection moulding, Compression moulding, Fourier-transform infrared spectroscopy, UV-visible spectroscopy, Differential thermal analysis, Thermogravimetric analysis, X-ray diffraction, Polarized optical microscope, Differential scanning calorimetry, Rheometer, Digital image correlation, Orthogonal cutting and indentation experiments, Scanning electron microscopy.	
EDUCATION	Indian Institute of Technology Kanpur Ph.D., Mechanical Engineering	2014 – 2023
	Indian Institute of Technology Varanasi (BHU) M.Tech., Material Science and Technology	2012 – 2014
	Kamla Nehru Institute of Technology, Sultanpur, UP B.Tech., Mechanical Engineering	2007 – 2011
PUBLICATIONS	<p>Shruti Pandey, K. K. Jana, Vinod K. Aswal, Dipak Rana, Pralay Maiti, “Effect of nanoparticle on the mechanical and gas barrier properties of thermoplastic polyurethane”, Applied Clay Science.  <a href="https://doi.org/10.1016/j.clay.2017.07.001">https://doi.org/10.1016/j.clay.2017.07.001</a></p> <p>Shruti Pandey, Pralay Maiti, K. K. Jana, Vinod K. Aswal, Dipak Rana., “Gas barrier properties of Polyurethane nanocomposites”, Journal of Applied Polymer Science.  <a href="https://doi.org/10.1002/app.54256">https://doi.org/10.1002/app.54256</a></p> <p>Shruti Pandey, Ishan Sharma, and Parameswaran V., “High strain rate behaviour of polycrystalline and porous ice: An experimental and numerical investigation”. Cold Region Science and Technology  <a href="https://doi.org/10.1016/j.coldregions.2024.104295">https://doi.org/10.1016/j.coldregions.2024.104295</a></p> <p>Shruti Pandey, Ishan Sharma, and Parameswaran V., “Effect of volume fraction and morphology on the dynamic compressive strength of ice-silicate mixtures.” (under review in Cold region Science and technology)</p> <p>Shruti Pandey, Ishan Sharma, and Parameswaran V., “Finite element modelling of dynamic behaviour of ice-silicate mixtures.” (to be submitted)</p> <p>Shruti Pandey, Shweta Mukundan, Bhupendra Chand, Renee M Borges, Tejas G Murthy, “Ecological and structural analysis of potter wasp nests.” (in preparation)</p> <p>Shruti Pandey, Tejas G Murthy, “Indentation in sand Laponite mixtures.” (in preparation)</p>	

Conference Publications and book chapter:

“Mechanical properties of thermoplastic polyurethane composites”, Nova Publishers  
[doi.org/10.52305/ERICI6604](https://doi.org/10.52305/ERICI6604)

“Fabric and Structure of Potter Wasp Nests”, International Conference on Bio-mediated and Bio-inspired Geotechnics 2025.

“Fabric and shear banding in sand laponite mixtures”, Powder and Grains 2025.

INDUSTRY EXPERIENCE	Maintenance engineer at BHASKAR EXXOILS PRIVATE LIMITED	2011 – 2012
TEACHING AND RESEARCH EXPERIENCE	<p>IISc Bangalore Research associate, Department of Civil Engineering Supervised an MS student during the primary supervisor's sabbatical. Managed lab activities and ensured research continuity.</p> <p>IIT Kanpur Teaching assistant in Dynamics (U.G.), Applied dynamics and vibrations (P.G.), Vibration of continuous systems (P.G.), Introduction to solid mechanics (U.G.) and Vibration control (P.G.)</p>	October 2023 – April 2025
ACHIEVEMENTS	<ul style="list-style-type: none"><li>▪ Awarded Indian Institute of Technology (BHU) Varanasi Gold Medal, 2014.</li><li>▪ Winner of oral presentation “IDEAZ” in COGNIZANCE at IIT Roorkee.</li><li>▪ Worked in the capacity of organizer in all India essay writing competition conducted by Sri Ram Chandra Mission in collaboration with United Nations Information Centre for India and Bhutan.</li><li>▪ Served as a member of Departmental Post Graduate Committee at IIT (BHU) Varanasi.</li></ul>	
CONFERENCES	<p>“High strain-rate behaviour of ice-silicate mixtures”, European Solid Mechanics Conference 2018, Bologna, Italy.</p> <p>“High strain-rate behaviour of ice-silicate mixtures”, Indian Conference on Applied Mechanics 2019, Bangalore, India.</p> <p>“Mechanical, viscoelastic and gas barrier properties of TPU nanocomposites”, Recent Advances in Polymer and Rubber Science &amp; Technology 2014, Kolkata, India.</p> <p>“Mechanical and gas barrier properties of TPU nanocomposites”, Asian Polymer Association 2014, Delhi, India.</p>	
RESEARCH	<p>Postdoctoral work Characterization and orthogonal cutting of sand laponite mixtures. Finite element modelling of Potter wasp nest.</p> <p>Ph.D. Thesis High strain-rate behaviour of ice and ice-silicate mixtures: experiments and simulations.</p> <p>The thesis aims at modelling the mechanical behaviour of ice at high strain-rates using Johnson–Holmquist II model and finding the effect of volume fraction of silica particles on the dynamic strength of ice-silicate mixtures.</p>	<p>2023 – 2025</p> <p>2014 – 2023</p>

	M.Tech. Thesis	2012 – 2014
	Study of gas barrier and mechanical properties of thermoplastic polyurethane and its composites.	
	The research studies the variation of permeability coefficient and mechanical properties of thermoplastic polyurethane composites with different filler concentration.	
PROJECT	B.Tech. Project	2010 – 2011
	Study & design of magnetorheological (MR) fluid based rear suspension of motorcycle.	
	Using variable viscosity of MR fluids, controlled via an external magnetic field, the project improved the balance of motorcycles, fuel efficiency, and provided smoother ride.	
COURSEWORK	Ph.D.	
	Mathematical methods in engineering, Introduction to continuum mechanics, Finite element methods, Theory of elasticity, Applied dynamics and vibrations, Vibration of continuous systems, Micromechanics.	
	M.Tech.	
	Materials characterization, Mechanical behaviour of materials, Composite materials, Physical behaviour of materials, Crystallographic and crystal structures, Phase diagrams and phase transformations, Polymeric materials, Renewable energy technology.	
TRAINING	Hydro Turbine Engineering (HTE), Bharat Heavy Electricals Limited (BHEL) Bhopal.	
	Duration: 4 weeks	2009
	Boiler Maintenance Department (BMD), Panki Thermal Power Station (PTPS) Kanpur.	
	Duration: 4 weeks	2010
SOFTWARES	ABAQUS, LaTeX, Origin, SolidWorks, MATLAB, Mathematica.	
REFERENCES	<p>Prof. Ishan Sharma  Room No. 727, ES-2  Mechanical Engineering and SPASE  Indian Institute of Technology Kanpur  Kanpur 208016, Uttar Pradesh, India  E-mail: <a href="mailto:ishans@iitk.ac.in">ishans@iitk.ac.in</a>  Web: <a href="http://ishans.in/">ishans.in/</a></p> <p>Prof. Sumit Basu  304 Northern Laboratories I  Department of Mechanical Engineering  Indian Institute of Technology Kanpur  Kanpur 208016, Uttar Pradesh, India  E-mail: <a href="mailto:sbasu@iitk.ac.in">sbasu@iitk.ac.in</a>  Web: <a href="https://www.iitk.ac.in/new/sumit-basu">https://www.iitk.ac.in/new/sumit-basu</a></p> <p>Prof. Pralay Maiti  School of Materials Science and Technology  Indian Institute of Technology (BHU) Varanasi  Varanasi 221005, Uttar Pradesh, India  E-mail: <a href="mailto:pmaiti.mst@itbhu.ac.in">pmaiti.mst@itbhu.ac.in</a>  Web: <a href="http://itbhu.ac.in/dept/mst/people/pmaitimst">itbhu.ac.in/dept/mst/people/pmaitimst</a></p>	<p>Prof. Parameswaran Venkitanarayanan  214, Northern Laboratories I  Department of Mechanical Engineering  Indian Institute of Technology Kanpur  Kanpur 208016, Uttar Pradesh, India  E-mail: <a href="mailto:venkit@iitk.ac.in">venkit@iitk.ac.in</a>  Web: <a href="http://home.iitk.ac.in/~venkit/">home.iitk.ac.in/~venkit/</a></p> <p>Prof. Tejas G Murthy  Department of Civil Engineering  Indian Institute of Science, Bangalore  Bengaluru 560012, Karnataka, India  E-mail: <a href="mailto:tejas@iisc.ac.in">tejas@iisc.ac.in</a>  Web: <a href="http://www.civil.iisc.ac.in/people/tejas">http://www.civil.iisc.ac.in/people/tejas</a></p> <p>Prof. Chandan Upadhyay  School of Materials Science and Technology  Indian Institute of Technology (BHU) Varanasi  Varanasi 221005, Uttar Pradesh, India  E-mail: <a href="mailto:cupadhyay.mst@itbhu.ac.in">cupadhyay.mst@itbhu.ac.in</a>  Web: <a href="http://itbhu.ac.in/dept/mst/people/cupadhyaymst">itbhu.ac.in/dept/mst/people/cupadhyaymst</a></p>