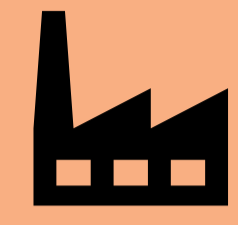


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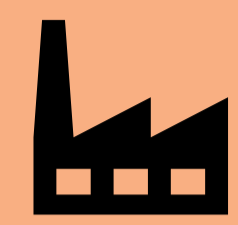
This portfolio showcases cutting-edge IISc innovations at the intersection of Manufacturing, Materials, and the Circular Economy. From advanced additive manufacturing (3D/4D bioprinting, metal printing, and high-temperature thermoplastics) to novel circular economy processes (waste-to-graphene, tungsten scrap recovery, and bioplastic degradation), these IPs address real-world industrial challenges. Industry partners will also find solutions for digital transformation of legacy systems, precision thermal management, smart building systems, and sustainable construction materials derived from mining waste. These technologies are available for licensing or collaborative development, bridging the gap between laboratory breakthroughs and scalable industrial applications. Explore the list below to discover your next strategic innovation partnership.

IP Reference Number	IP Title	Faculty Inventor @ IISc
IDR-CeN-2025-096	A novel method for Electrocatalytic reduction of Nitrate/Nitrite to Ammonia directly from air using plasma technology	Aditya Sadhanala
MS-CPDM-2024-094	Digital Transformation of Legacy Machines for SMEs	Amaresh Chakrabarthi
MS-CiE-2024-055	Apparatus to Estimate the Minimum Density by Aeration Technique	Anbazhagan P
MS-CiE-2024-054	IISc Maximum Density Apparatus	
MS-CiE-2026-008	Circular Target-Based High-Speed Non-Contact Visual Tracking System for Three-Dimensional Displacement and Energy Measurement in the Standard Penetration Test	
MS-CiE-2026-001	FVCD Method: A Dynamic Force- or Velocity-Sign-Reversal-Based Time Window for Reliable Hammer Energy Measurement in the Standard Penetration Test (SPT)	
CS-IPC-2023-001	Enhancing the electrical conductance of non-conducting polymers and molecular materials by vibrational strong coupling	Anoop Thomas
MS-MAT-2025-141	Mucin based bioprinting ink compositions and methods of use thereof	Ashok M Raichur
CS-MRC-2023-148	Decision support platform for metal 3D printing	Bikramjit Basu
MS-CPDM-2023-140	A Motorized Device for Removal of 3D Printed Parts from Build Platforms	Dibakar Sen
MS-CPDM-2023-137	Device for Sanitary Waste Disposal	
ES-EE-2024-134	System and method for characterization of multi-orifice gas-film thrust bearing	Gopalaratnam Narayanan
ES-EE-2023-022	System and method for static and dynamic characterization of gas-film thrust bearing	
MS-MAT-2025-070	3D-Bioprinted Lung-on-a-Dish	Kaushik Chatterjee
MS-MAT-2025-009	Development of novel technological route by Micro Diffusion-Based Additive Manufacturing System for Near-Net- Shape Component Fabrication	
MS-MAT-2025-002	Tailored Heat Treatment for Superior Biomechanical Response in additively manufactured Ti-6Al-4V ELI Bone Plates	
MS-MAT-2024-008	3D/4D printing of conducting hydrogel ink	
MS-MAT-2023-147	Fabrication of bioresorbable biliary stents via additive manufacturing and surface modification	
MS-MAT-2023-102	4D printing of NIR-triggered shape memory polymer composites for deployable tissue scaffolds	
MS-MAT-2023-014	Fabrication of programmable and deployable hydrogels via 4D printing	
MS-MAT-2023-005	Digital Light Processing (DLP) printed Nanocomposite scaffolds of Photopolymerizable κ -Carrageenan	Koushik Viswanathan
MS-ME-2026-016	Physics-Informed Digital Twin Framework for Hybrid Manufacturing: Integrated Simulation, Process Planning, and Direct Kinematic Control	
MS-ME-2026-015	Flexible Manufacturing/ Production System based on parallel kinematic mechanisms for realizing hybrid manufacturing/inspection applications	
MS-ME-2026-014	Parallel kinematics based metal 3D printer and process of control	
MS-CiE-2023-070	Textured Geogrids	Madhavi Latha G
MS-CiE-2023-046	Geocell Anchor Cage (GAC)	
MS-CPDM-2025-030	3D printed electronics by hybrid additive manufacturing	Manish Arora
MS-CPDM-2025-138	An apparatus and method for 3D printing high temperature engineering thermoplastics on open chamber desktop material extrusion additive manufacturing (MEAM) based 3D printers.	
MS-CPDM-2024-063	Maturity Assessment of Digitalization of the Quality-Management System (MADQMS)	
MS-ME-2023-096	Concept of cooling system to maintain a space below ambient temperature by using two phase thermosyphon system and thermal storage tank coupled with a sky-cooled radiator	Pradip Dutta
IDR-ICER-2024-122	Thermal Management in Rotating Machines	Pramod Kumar
MS-MAT-2025-163	Laser-induced graphene from biomass waste for CR(vi) remediation: a DFT and SDG-linked approach	Praveen C Ramamurthy
MS-MAT-2025-130	Single step room-temperature process development for recovery of high-purity ammonium Paratungstate (apt) from tungsten scrap	
MS-MAT-2024-104	Zif-67/PVA nanofiber for highly efficient removal of lead from wastewater	



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IDR-CeN-2024-119	Drop-on-demand using mechano-impact printing	Prosenjit Sen
IDR-CeN-2023-007	Laser Etching of Wide Band Gap and Ultrawide Band Materials Using Low-Cost Etching Setup	
MS-ME-2023-019	Polymer 3D printer with a material dispensing system mounted on a cable-actuated flexible arm	Ramsharan Rangarajan
MS-CPDM-2025-089	Assistive device for fire fighting automatic cut-in and cut-off	Rina Maiti
MPS-IAP-2023-073	A method for obtaining patterned porous elastomer	Sanjiv Sambandan
MS-ME-2026-005	A device to generate isolated and cluster of droplets (atomizer)	Saptarshi Basu
MS-ME-2026-003	A Method and Apparatus for Spray Conditioning and Droplet Size Control	
MS-ME-2023-037	Miniature shock tube setup for secondary atomisation applications.	
MS-ME-2024-174	The Cyclic-Friction Assisted Lateral Extrusion Process (C-FALEP) – for achieving Severe Plastic Deformation (SPD) in one processing step	Satish Vasu Kailas
MS-ME-2024-006	The High-Pressure Compressive Reverse Shearing (HPCRS) severe plastic deformation process	Siddharth Jhujhunwala
IDR-BSSE-2024-001	Deploying Dictyostelium sp. for the clearance of nano- and sub-micro plastic contaminants in soil and other environmental locations	
MS-CST-2025-054	Development of efflorescence-free geopolymer for walling and architectural Applications utilizing mining wastes	Souradeep Gupta
MS-CST-2024-154	3D printing with geopolymer-stabilized excavated earth: a method for controlled retardation and enhanced long-term engineering properties	
MS-CST-2024-123	A novel earth-based composite for additive manufacturing and their preparation methods	
CS-MRC-2025-060	Fabrication of High-Internal-Phase Pickering Emulsions using Waste Plastic-Derived Carbon Dots and the Method thereof	Subinoy Rana
MS-MAT-2026-010	High-Performance Recyclable Epoxy Thermosets with Integrated Dynamic Covalent and Non-Covalent Networks.	Suryasarathi Bose
MS-MAT-2025-206	A Mechanically Resilient Carbon Fiber Reinforced Composites with Built- in Healing and Full Recyclability	
MS-MAT-2025-179	Upcycling of High Impact Polystyrene (HIPS) in melt using dynamic covalent chemistry.	
MS-MAT-2025-178	Dual CAN Methods for Upcycling of Post-Consumer Recycled Polypropylene (PCR PP) and their blending with Post-Consumer Recycled Polyethylene (PCR PE) for Enabling the Circular Economy	
MS-MAT-2025-173	Chain Extender-Mediated Vitrimerization for Upcycling Post-Consumer Recycled Polyolefins with Enhanced Flexibility.	
MS-MAT-2025-145	Tunable epoxies from flexible to rigid there of	
MS-MAT-2025-144	Composition(s) and process to synthesize epoxy based vitrimer.	
MS-MAT-2025-136	Upcycling of Thermoplastic Polyolefins (TPOs) wastes Using Vitrilomer Chemistries	
MS-MAT-2025-133	Valorization of Multi-Layered Packaging Waste: From Separation of Polymers to Upcycled Polyolefin-Based Vitrimers	
MS-MAT-2025-132	Flexible bio-based epoxy films and foams for multi-functional applications.	
MS-MAT-2025-119	Development of Eco-friendly, Non-isocyanate, Non-foaming Based Flexible Foam	
MS-MAT-2025-117	Recyclable Vitrimer Systems from Post-Consumer Recycled Polypropylene (PCR PP) Enabling Circular Reuse and Upcycling of Post-Consumer Recycled Polyethylene (PCR PE)	
MS-MAT-2025-114	Sustainable Adsorbent for the Removal of Natural Uranium and Some Associated Pollutants From Drinking Water	
MS-MAT-2025-112	Upcycling of Thermoplastic Polyolefins (TPOs) wastes Using ViNOMER	
MS-MAT-2025-073	Method of synthesizing flexible and rigid acetal exchange-based Vitrimer Epoxies.	
MS-MAT-2025-024	Eco-friendly Circular Economy for Waste polyurethane (PU) with Bio-based Technologies - [SalSo Technology]	



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MS-MAT-2025-008	Method of synthesizing flexible and rigid acetal exchange-based Vitrimers Epoxies.	Suryasarathi Bose
MS-MAT-2024-157	Trash to treasure in post-consumer recycled polyolefins	
MS-MAT-2024-146	Recycling Epoxy Vitrimers and Composites Thereof	
MS-MAT-2024-155	Water softening beads	
MS-MAT-2024-126	Upcycling acrylonitrile-butadiene-styrene	
MS-MAT-2024-103	Upcycling of Polyamides using multifunctional amines	
MS-MAT-2024-100	Recycling Epoxy and its composites [Main Salso Patent]	
MS-MAT-2024-097	Water Softening Gels	
MS-MAT-2024-067	Recycling PTFE Scraps with functionalized ABS, PP, epoxy and PVA type polymers	
MS-MAT-2024-058	Upcycling Thermoplastic Polyolefins and Multilayered Plastics	
MS-MAT-2024-040	Shear-aligned graphene oxide liquid crystals interlock in an interpenetrating polymeric network membrane and offer precise molecular sieving	
MS-MAT-2024-025	Flexible and self-healing bio-based vitrimer epoxy foam for strategic applications	
MS-MAT-2023-165	Mitigating Microplastic Pollution in Water through Triple Interpenetrating Polymer Network Hydrogel: Detection, Removal, and Upcycling	
MS-MAT-2023-072	Recycling PCR Polyolefins Using Vitrimer Chemistries	
MS-MAT-2023-058	Rapid Up-cycling of PCR-ABS through Melt Extrusion	
MS-MAT-2023-047	Thermoplastic Bio based Epoxy Vitrimers and coating thereof	
MS-MAT-2022-108	Super Tough Water-Soluble Polymers using Vitrimer Chemistry	
MS-MAT-2022-106	Ultra-fast cured epoxies	
MS-ME-2023-011	Precise charging method for microscale two-phase heat transport devices	T Venkata Prabhakar
MS-ME-2024-039	Siphon-based scalable and salt-resistant multistage thermal desalination system	
ES-DESE-2025-137	Machine Vision Inspection System	Tapajyoti Das Gupta
MPS-IAP-2023-069	Self-assembled patterning of droplets via instabilities of a cracked thin film on a soft substrate	
MS-CPDM-2025-158	A movable and modular height-adjustable non-load bearing walling, partitioning and space-creation system with customizable shelving or openings	Vishal Singh
MS-CPDM-2025-157	A building system to enable high-rise buildings with plug-in and play prefabricated modular living units and corresponding real-estate business innovation	
MS-CPDM-2025-085	Unitised Biophilic Curtain Wall for Enhanced Occupant Wellbeing	
MS-CPDM-2024-061	Greel & grail railing systems	
MS-CPDM-2024-060	An Aggregated Elevator Car System For Variable Lifting Capacity and Volumetric Space	
MS-CPDM-2024-027	An Assembly System and Design for Transverse Movement of Full-length Sliding Door/ Window Frames and Partition Walls	Yagnaseni Roy
MS-CST-2025-156	Method to prepare fabrics of desired porosity, pore size and thickness to obtain a precalculated filtration efficiency and breathability.	
MS-CST-2025-149	Deep Eutectic Solvent Formation Post Fluoride Salt Extraction	
MS-CST-2024-109	Improved method for single plastic recovery from plastic waste	
MS-CST-2024-049	High quality plastic recovery from single-type plastic waste	
MS-CST-2023-088	Zero waste arsenic remediation system	
MS-CST-2023-129	Novel process scheme for curcumin isolation using novel nanofiltration membrane	