

Patents filed since 2023

This collection of IISc patents showcases cutting-edge innovations across the energy, power, and battery systems landscape - ranging from next-generation battery chemistries (Li/Na/K-ion, zinc, redox flow) and advanced supercapacitors to high-efficiency power converters, magnetic bearing systems, and modular battery management electronics. Industry partners will find scalable solutions for energy storage, power conversion, motor control, and fault protection, all designed to enhance performance, safety, and compactness. These technologies represent opportunities for licensing or collaborative development, bridging novel laboratory breakthroughs with real-world industrial applications. Whether you seek improved electrode materials, soft-switched converters, or intelligent cell equalization methods, this portfolio offers diverse pathways to advance your product roadmaps. Explore below to identify synergies with your ongoing or next-generation energy system projects.

IP Reference Number	IP Title	Faculty Inventor @ IISc
MPS-IAP-2025-103	Photo rechargeable supercapacitors that exhibit an increase in capacitance with an increase in current	Abha Misra
MPS-IAP-2023-036	Ultramicro supercapacitor	
IDR-ICER-2024-170	In-situ Polymerized Gel Electrolytes for High-Performance Sodium-based Batteries	Aninda J Bhattacharyya
IDR-ICER-2024-140	Scalable Sulfur Composite Cathodes for High-Performance Lithium-Sulfur Batteries	
ES-EE-2025-207	Event-Driven Near-Field Radar Imaging	Chandra Shekar Seelamantula
ES-EE-2024-093	System and methods for model independent predictive current control of switched reluctance machine	Gopalaratnam Narayanan
ES-EE-2023-021	System and Method for Static and Dynamic Characterisation of Magnetic Thrust Bearing	
ES-EE-2023-055	Four quadrant switch using half bridge semiconductor modules	Gurunath Gurrala
ES-EE-2023-028	A point of wave multi-phase fault creator with fault-clearing capability	
IDR-ICER-2024-135	Fuel cell flow design for improved power efficiency	Jaichander Swaminathan
ES-EE-2024-052	A Multi-excited Induction Launcher using Split Drive Coils	Joy Thomas Meledath
ES-EE-2025-017	Development of Control Algorithm for Medium Voltage AC to Multi-port Low Voltage DC Converters for Utility-scale Grid Integration of Solar and Storage.	Kaushik Basu
ES-EE-2024-014	Dual-Active-Bridge derived Single-Stage Soft-Switched medium voltage AC to low voltage DC solid state transformer.	
ES-EE-2024-013	Multi-port medium voltage AC to Low voltage DC Power electronic converter with Inter-Module Transformer at the Low Voltage side.	
ES-EE-2023-156	A Soft-Switched LVDC to Three-Phase MVAC Converter for MV Grid Integration of Utility-Scale Solar PV	
IDR-CeN-2024-003	Novel Nano-composite Core-Shell magnetic material for compact power inductors in the MHz range	Navakanta Bhat
CS-MRC-2024-143	Biomass-derived hard carbon as a high-performance anode for Na-ion battery	Prabeer Barpanda
CS-MRC-2024-142	Cathode materials for aqueous zinc-ion batteries comprising Li-rich vanadium oxides	
CS-MRC-2023-153	An Fe-based mixed polyanionic cathode material for rechargeable lithium-ion batteries	
CS-MRC-2023-152	Anode materials for rechargeable sodium-ion batteries comprising molybdenum-based alluaudite frameworks	
CS-MRC-2023-145	Sodium Battery Electrode Materials Comprising Tungstate and Applications Thereof	
CS-MRC-2023-130	A binary layered oxide intercalation cathode for rechargeable potassium-ion batteries	
CS-MRC-2023-134	A cathode material for lithium-ion batteries comprising hydroxysulfate	
CS-MRC-2023-013	Layered P3 type binary cathode material for secondary potassium-ion batteries	

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MS-ME-2024-024	Fire-jet igniter for IC engine applications fueled by hydrogen, CNG, ammonia and their blends	R V Ravikrishna
MS-ME-2024-023	Opposed piston, two-stroke internal combustion engine for gasoline, ethanol, methanol, and their blends	
MS-ME-2024-022	Opposed piston, two-stroke internal combustion engine for natural gas, hydrogen, ammonia, biogas, and their blends	
MS-ME-2023-051	M100 (100% methanol-fueled) engine for powering buses and trucks	
ES-EE-2023-076	Active Learning Initialisation for Flight Maneuver Classification	Rathna G N
CS-SSCU-2024-081	A high-performance soluble lead redox flow battery	Satish Patil
CS-SSCU-2025-067	An ameliorated graphite, a lead (iv) oxide cathode and a battery thereof	
IDR-CeN-2025-129	Innovative composite toroidal-inductor using two materials for uniform flux and improved performance in SMPS and other applications	Shivashankar S A
ES-EE-2025-033	Reconfigurable Single Input Multiple Output (SIMO) Switched Capacitor Multilevel Inverter with Independent Frequency Control and High Voltage Boosting	Tapas Roy
ES-DESE-2023-029	Active Paralleling of Batteries or cells or strings	Umanand Loganathan
ES-DESE-2023-009	Electromagnet Rotor based Switched Reluctance Machine for Electric Vehicle Applications	
ES-EE-2025-208	Multi-port Power Circulation Method for Characterizing Multiple Electrochemical Storage Devices	Vinod John
ES-EE-2025-183	Storage Module Augmented for Reuse by electronics (SMART) Battery	
ES-EE-2025-111	A low component count, fast, compact and modular cell equalizer for large cell count, high voltage, high power battery/ultracapacitor stack.	
ES-EE-2024-066	Tapped-inductor Four-switch Buck-boost Converter and Operating Method Thereof	
ES-EE-2024-017	An electrical device to delimit the current change rate in switch and energy in microwave tube during crowbar operation	
ES-EE-2024-007	A fast, compact, and decentralized modularization method for battery voltage equalizers in a large cell-count battery stack	
ES-EE-2023-089	Minimum Switch Count Low Volt-Ampere Rated DC Bus Second-Harmonic Ripple Compensator	
ES-EE-2023-016	Soft-switched Non-isolated Converter with Trapezoidal Current Modulation	
ES-EE-2023-039	Method and Configuration for Efficient Operation of Modular Paralleled Asymmetric Soft-switched Converters	
ES-EE-2023-015	Tapped-inductor Dual-active-half-bridge Converter for 48V Point-of-load Applications	
ES-EE-2023-002	Planar printed circuit board winding architectures to reduce dc resistance	Vishnu Mahadeva Iyer
ES-EE-2025-108	Modular multi-cell voltage equalizer with adjustable intra and inter-module balancing currents for high-voltage battery packs.	
ES-EE-2024-010	Device and method for transforming single-phase AC to multiport DC	
ES-EE-2023-158	Multiport Electric Vehicle Charging Station and Method of Controlling the Same	
ES-EE-2023-087	Device and method for transforming single-phase AC current into DC current	
ES-EE-2023-086	Circuit for Generation of Variable Frequency Multilevel Voltage Excitation	