2025 IEEE 4th International Conference on Smart Technologies for Power, Energy and Control (STPEC 2025)

December 10-13, 2025
Department of Electrical and Electronics Engineering,
National Institute of Technology Goa, Goa, India

Special Session 17 (SS17)

Electrochemical Energy System: Materials, Modelling, and Control

Organized and co-chaired by:

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Call for Papers

- **Technical Outline of the Session:**

The future development of smart and sustainable power depends heavily on electrochemical energy systems (EES). They support electrification and decarbonization goals by providing long-lasting, efficient storage components for electric vehicles, renewable energy storage, and smart grid applications. With an emphasis on materials, modelling techniques, and control strategies, this Special Session seeks to bring together researchers and practitioners to discuss recent developments in EES. This session showcases advancements at the nexus of smart technologies in energy and power by bringing together materials scientists, modellers, and control engineers. The goal of the session is to promote multidisciplinary collaboration and showcase innovations that bridge the gap between fundamental research and real-world applications in EES.

- **Topic of the Session includes, but are not limited to:**
  - Advanced materials for electrochemical energy system
  - Experimental and computational materials design
  - Physics-based and data-driven modelling approaches
  - Multiphysics simulation, parameter estimation and sensitivity analysis
  - Battery management systems and control algorithms
  - Adaptive and model predictive control for EES
  - Integration of storage systems in EV powertrains, smart grids and renewable energy applications
  - Cyber-physical battery systems for IoT and edge control
  - Optimal energy scheduling using storage under uncertainty
  - Diagnostics, prognostics, and lifecycle management

- **Important Dates:**
  - Special Session Paper Submission Due : June 15, 2025
  - Notification of Paper Acceptance : July 31, 2025
  - Camera Ready Paper Submission Due : August 31, 2025
  - Regular Registration Due : October 30, 2025

Author guidelines as per regular paper submission.

IEEE Template

Submission Portal

https://nitgoa.ac.in/STPEC2025/specialsessions.html

For queries, email: ss_stpec2025@nitgoa.ac.in