

## Special Issue

# Flash Joule Heating-Driven Processes for Environmental Remediation and Waste Valorization

### Message from the Guest Editors

Flash Joule Heating (FJH) has rapidly emerged as a powerful electrothermal platform capable of driving ultrafast chemical transformations through millisecond-scale heating to extreme temperatures. This unique non-equilibrium thermal environment unlocks reaction pathways that are inaccessible to conventional thermal processing, enabling highly efficient destruction of persistent pollutants and the upcycling of diverse waste streams. Recent advances have demonstrated FJH-enabled mineralization of PFAS, decomposition of organic contaminants, recovery of critical elements, and conversion of industrial wastes, such as plastics, electronic scrap, spent batteries, and construction residues, into valuable functional materials including carbons, carbides, metals, and composite reinforcements. This Special Issue invites original research and review articles that advance the science, mechanisms, engineering, and applications of FJH-driven processes. Contributions addressing reaction fundamentals, materials evolution, reactor design, scale-up, life cycle assessment, and integrated waste-to-resource pathways are particularly encouraged.

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### Deadline for manuscript submissions

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