

Special Issue

Physics and Technologies of Vacuum Switching

Message from the Guest Editor

For a century, vacuum electronics progressed from thermionic valves to high-power microwave sources and modern switching devices, grounded in low-pressure plasma and electron emission physics. Vacuum switching emerged as a critical domain where this physics governs dielectric insulation and current interruption. Current research refines electron emission theories, magnetohydrodynamic arc models, plasma-surface interactions, and integrates AI with diagnostics to predict switching behavior. This Special Issue showcases pioneering research on vacuum switching. Topics include:

- Vacuum switching: AC/DC interruption, controlled/triggered switching, hybrid concepts, apparatus for renewable energy and storage.
- Vacuum arcs: cathode spot dynamics, electron emission, plasma-surface interactions, anode phenomena, magnetic effects, contact materials, droplet/particle dynamics.
- Vacuum breakdown & insulation: pre-breakdown/surface discharge, pre-breakdown emission, high-voltage pulsed switching, triggered gaps, surface conditioning, post-arc recovery, dielectric breakdown.
- Computational modeling & AI: MHD simulations of arcing, machine learning for arc prediction, advanced diagnostics.

Guest Editor

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About the Journal

Message from the Editor-in-Chief

Electronics is a multidisciplinary journal designed to appeal to a diverse audience of research scientists, practitioners, and developers in academia and industry. The journal is devoted to fast publication of latest technological breakthroughs, cutting-edge developments, and timely reviews of current and emerging technologies related to the broad field of electronics. Experimental and theoretical results are published as regular peer-reviewed articles or as articles within Special Issues guestedited by leading experts in selected topics of interest.

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