

Special Issue

New Challenges in Electron Beams

Message from the Guest Editor

This SI mainly introduces the latest progress and applications of high-power electron beams in various vacuum electron devices (VEDs), including the gyrotron, gyro-traveling-wave tube, traveling-wave tube, klystron, backward wave oscillator, series sheet beam devices, pseudospark, etc. The purpose is to attract novel and advanced research work related to the design, experimental implementation, and application of high-power electron beams. We also welcome manuscripts on the integration of high-power electron beams in other fields. The scope of this Special Issue incorporates but not limited to the following:

- Novel electron gun design for various vacuum electron devices;
- Electron emission theory, material, and cathode investigation;
- Phenomenon investigation for breakdown, ionization, and halo in the electron beam generation and transportation processes;
- Thermal analysis for high-power electron optics systems;
- Applications such as accelerators, vacuum displays, materials processing technologies, electron beam lithography, etc.;
- Related interdisciplinary technologies to improve current electron beam performance or extend the application scope.

Guest Editor

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About the Journal

Message from the Editor-in-Chief

Quantum Beam Science focuses on application of quantum beams for the study and characterization of materials in their widest sense, and developments of quantum beam sources, instrumentation and facilities. Quantum beams include synchrotron radiation, neutron beams, electrons, lasers, muons, positrons, ions. The journal covers disciplines including, solid state physics, chemistry, crystallography, materials science, biology, geology, earth- and planetary materials, and engineering. Articles presenting multiple quantum beams for complementary studies are welcome.

Editor-in-Chief

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manuscripts are peer-reviewed and a first decision is provided to authors approximately 31.8 days after submission; acceptance to publication is undertaken in 6.7 days (median values for papers published in this journal in the second half of 2025).