

Special Issue

Modification of Materials by Using Energetic Ion/Electron Beams

Message from the Guest Editor

One of the most effective methods for modifying materials used in various fields of science and industry is exposure to ionizing radiation. Modification with beams of accelerated particles (ions or electrons) is based on the creation of defective states on the surface and volume of a material, leading to a rearrangement of its atomic structure. Radiation modification, as one area of radiation technology, has found wide application in the modification of polymers (crosslinking and polymerization), increasing the corrosion resistance of metals and alloys during ion implantation and the doping of semiconductors. Moreover, beams of energetic particles are actively used to synthesize new materials with unique properties, as well as to simulate various types of space radiation to determine the radiation stability of space technology materials. The planned Special Issue will present the results of research on the use of accelerated electron and ion beams in material science, including, but not limited to, the synthesis of new materials, the modification of materials for property improvement, and the use of ionizing radiation to determine the radiation...

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.

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manuscripts are peer-reviewed and a first decision is provided to authors approximately 26.8 days after submission; acceptance to publication is undertaken in 9.8 days (median values for papers published in this journal in the first half of 2025).