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# Laser–Material Interaction: Principles, Phenomena, and Applications

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## Message from the Guest Editors

Laser–material interaction is a fascinating nexus wherein laser physics, optical physics, and materials science intersect. The main factors that influence this process are the laser beam properties, the material characteristics, and the phenomena that occur during and after the interaction.

The laser beam properties include the wavelength, intensity, pulse duration, and beam shape. These affect how the laser energy is absorbed, reflected, or transmitted by the material. The material characteristics include the composition, structure, phase, temperature, and optical properties. These determine how the material responds to laser irradiation. The phenomena that occur during and after the interaction include heating, melting, evaporation, plasma formation, shock waves, phase transformations, and material transport.

Laser–material interaction has many applications in various fields, such as microfabrication, surface modification, materials processing, biomedical engineering, and sensing. By controlling the laser parameters and the material properties, one can achieve the desired effects on the material surface or inside the material volume.

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## Message from the Editor-in-Chief

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