Special Issue

Novel Technologies and Discoveries for Nuclear Fusion

Message from the Guest Editors

Nuclear fusion development is accelerating, driven by groundbreaking advances across multiple research areas. This Special Issue presents cutting-edge research tackling key challenges in fusion science and engineering. It highlights innovations in magnetic confinement fusion (MCF), including advanced Tokamak designs and breakthroughs in superconducting magnets and plasma control. In inertial confinement fusion (ICF), recent ignition achievements spur progress in laser technology and target design. Fusion-fission hybrid systems are explored for waste transmutation, energy production, and tritium breeding. Critical tritium breeding and extraction technologies are also addressed with novel materials and concepts. The research covers theoretical, experimental, and engineering advancements, advancing both fundamental understanding and practical solutions for commercial deployment, from plasma physics to materials and modelling. These novel technologies and discoveries are crucial as the fusion community moves closer to net energy gain and commercial viability, paving the way for a fusion-powered future.

Guest Editors

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Message from the Editor-in-Chief

As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal *Applied Sciences* has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

Editor-in-Chief

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