



New Frontiers of X-ray Free-Electron Lasers

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Message from the Guest Editor

Dear Colleagues,

We cordially invite you to participate in this Special Issue on auspicious ideas for future science at X-ray free-electron lasers (XFELs). The issue should cover both novel concepts for tailored X-ray pulse generation and characterization, as well as pioneering experimental schemes and state-of-the-art research taking advantage of these exciting new possibilities.

A major focus shall lie in contributions concerning the emerging science with sub-femtosecond X-ray pulses, from the generation and control of attosecond pulses to the study of attosecond dynamics at free-electron lasers, covering the initial excitation or ionization steps in small gas-phase systems, in the condensed phase and in (quantum) materials, ultrafast charge and energy transfer in molecules, photochemical dynamics, ultrafast magnetic exchange and spin switching, and time-resolved imaging, as well as the investigation of X-ray-driven strong-field phenomena.

It is envisioned that attosecond pulses will give a new twist to XFELs and stimulate cooperation between diverse research areas, which shall be supported by the broad scope of this Special Issue.

Prof. Dr. Wolfram Helml
Guest Editor





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Message from the Editor-in-Chief

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