

Electronic structure and strong-field calculations for atoms and ions

Applications are invited for PhD students to participate and supervise electronic structure and strong-field calculations for atoms and ions. The Atomic Theory Group of the Helmholtz-Institute Jena has a good experience in the relativistic atomic structure and density matrix theory as well as in modeling the dynamics of -- multiple and highly charged -- ions.

A good understanding of the elementary processes is essential in order to describe the spectra from experiment and to resolve fast, time-dependent mechanisms and phenomena:

Current topics of interest:

- (1) Accurate atomic many-body theory and computations;
- (2) Interactions of atoms with twisted light and electron beams;
- (3) Strong-field ionization and recombination as well as high-harmonic generation;
- (4) Multiphoton processes in intense FEL radiation;
- (5) Entanglement and tomography of atomic processes.
- (6) Multi-qubit systems for teleportation, quantum steering and tomography.

Knowledge in at least one of these areas is highly appreciated for this project:

Theoretical Atomic, Plasma & Quantum Physics

The applicant should have a good theoretical background related to at least one of the areas listed above. A proven research ability, demonstrated written and oral communication skills and the ability to work both, independently and cooperatively with others, are highly desirable. Computer skills required include Julia, python, or C++, Maple, Windows and/or Linux.

Contact: Prof. Stephan Fritzsche

Helmholtz-Institut Jena & Physikalisch-Theoretisches Institut Jena,
s.fritzsche@gsi.de