MAX-PLANCK-INSTITUT FÜR KERNPHYSIK

Zertifikat seit 2006 audit berufundfamilie

The Max Planck Institute for Nuclear Physics (www.mpi-hd.mpg.de) is one of 86 research institutes of the Max Planck Society for the Advancement of Science e.V. (MPG). The MPG is an independent, non-profit research organization, which seeks to promote basic research in the service of the general public.

The Division of Quantum Dynamics and Control Division (Director: Prof. Dr. Thomas Pfeifer) at the Max Planck Institute for Nuclear Physics in Heidelberg (Germany) offers

Postdoc positions (m/f/d)
in gas-phase attosecond molecular dynamics at free electron lasers

Working field / your tasks

We offer new opportunities for postdoc projects in the area of experimental strong-field physics and ultrafast light-matter interaction, collaborating at external FEL beamtimes and working with state-of-the-art in-house laser light sources. We are interested in understanding and steering/controlling the fundamental laser-driven (nonlinear) quantum dynamics of electron motion within small atoms and molecules. Hereby we pursue a bottom-up approach with the goal to obtain a complete understanding of the correlated interaction and dynamics of charged particles in small quantum systems at their natural attosecond to femtosecond time scale.

Within our ongoing FEL projects we utilize intense XUV and x-ray radiation to measure ultrafast molecular dynamics with electronic state sensitivity [1,2], extracted from time-resolved and nonlinear XUV/x-ray transmission and absorption spectroscopy. In the future we aim to push the frontier of these investigations to the natural attosecond timescale of electron motion. Enabling a new perspective on spectro-temporal dynamics, one key ingredient is hereby the shot-by-shot tagging of FEL spectra at high-repetition rate [3]. You will take a strong role in performing the data analysis and scientific interpretation, both before, during and after planned new FEL beamtimes, as well as coordinating various efforts within the collaborating experimental and theory teams.

Requirements:

PhD in physics or related disciplines with strong background in ultrafast atomic and molecular physics, in particular including nonlinear XUV/x-ray light-matter interaction. Hands-on experience with ultrafast XUV and x-ray radiation sources at free electron lasers. Hands-on experience with ultrahigh vacuum systems and complex experimental apparatus, e.g., for performing time-resolved XUV/x-ray absorption spectroscopy. Excellent data analysis skills for handling and interpreting large and complex datasets.

The position is initially offered for 2 years and can be extended.

The salary will be paid according to the collective agreement for civil service employees in Germany (TVöD).

The Max Planck Society promotes the employment of disabled persons, strives for diversity and equal opportunities including professional gender equality and excellent reconciliation of family and career. We have set our focus on increasing the proportion of women in areas in which they are underrepresented. The Max Planck Institute for Nuclear Physics is a family-friendly employer.

Further information can be obtained from PD Dr. Christian Ott: christian.ott@mpi-hd.mpg.de and Prof. Dr. Thomas Pfeifer: thomas.pfeifer@mpi-hd.mpg.de

https://www.mpi-hd.mpg.de/mpi/en/research/scientific-divisions-and-groups/quantum-dynamicscontrol/research/excited-atomsmolecules-in-strong-fields-ag-ott

Applicants are encouraged to send a curriculum vitae and a motivation letter, reflecting their motivation and interest for the research opportunities outlined above.

Applications should be uploaded **ONLINE** with reference 11-2024.

[1] Magunia et al., “Time-resolving state-specific molecular dissociation with XUV broadband absorption spectroscopy”, Science Advances 9, adk1482 (2023).
[2] Jin et al., “Transmission spectroscopy of CF_4 molecules in intense x-ray fields”, arXiv:2407.04303v1, (2024).
[3] Straub et al., “Differential Measurement of Electron Ejection after Two-Photon Two-Electron Excitation of Helium”, Phys. Rev. Lett. 129, 183204 (2022).

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