Max-Planck-Institut für Kernphysik

Max Planck Institute for Nuclear Physics

The Max Planck Institute for Nuclear Physics (www.mpi-hd.mpg.de) is one of about 84 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.

We offer a position as a

Post Doctoral Research Associate (m/f/d)

in the Ultrafast Liquid Crystals Dynamics (ULCD) group

Despite the tremendous advances of liquid-crystals-(LCs-)based technologies and their widespread use in optoelectronic devices, the in-depth understanding of the underlying physical mechanisms is still lacking. In particular, the physics of ultrafast LCs dynamics, involving possible coupling between electron and molecular degrees of freedom, is largely unexplored.
In a preliminary study, investigating the ultrafast (electronic) modulation of the LCs refractive index at optical frequencies, we found that the electronic excitation relaxes via coherent molecular vibrations, thus also modulating the LCs birefringence at THz frequencies.
The research proposed here will mainly focus on the understanding of such low-frequency phenomena across LCs phase transition from liquid to solid phase. In particular, this investigation will allow us to determine the degree of localization of collective molecular dynamics excited by intense, broadband, and phase-stable THz pulses. In turn, this will enable answering fascinating questions regarding: i) the nature of such collective molecular dynamics, ii) their impact on LCs electronic and structural properties (phase transition), as well as iii) the role of LCs chirality in these dynamics.

The successful candidate will be responsible for the optical-THz pump-probe characterization setup, where high-field broadband THz radiation is obtained by pumping an organic crystal with an OPA, driven by a state-of-the-art amplified Ti:Sapphire laser system (~35 fs, ~9 mJ). In addition, the candidate will be in charge of data acquisition and analysis, dissemination of results, as well as the co-supervision of PhD and master/bachelor students. At the same time, the candidate will be introduced to different LCs sample preparation techniques and optical characterization methods.

Requirements

We are seeking an outstanding and highly motivated candidate with a PhD degree in physics (or closely related subjects), with an established experience in optics and THz science. Programming capabilities (MATLAB, Python etc.) are highly recommended. Moreover, good written and oral communication skills in English are required.

The position is initially offered for 1 year, starting as soon as possible, and can be extended up to 3 years.

The salary will be paid according to the collective agreement for civil service employees in Germany (TVöD). The Max-Planck Society is committed to increasing the number of individuals with disabilities in its workforce and therefore encourages applications from such qualified individuals. Furthermore, the Max Planck Society seeks to increase the number of women in those areas where they are underrepresented and therefore explicitly encourages women to apply. The Max Planck Institute for Nuclear Physics is a family-friendly employer.

Further information can be obtained from Dr. Laura Cattaneo: cattaneo@mpi.hd.mpg.de

Applications, including a Statement of Interest, CV, list of grades (Bachelor and Master), publication lists and contact information of at least two referees should be uploaded **ONLINE** with reference # **13-2020.**

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