Postdoc Position in “Ultrafast terahertz control of magnetic and lattice dynamics in low-dimensional antiferromagnets”

Institute of Applied Physics – University of Bern, Switzerland

A postdoc position is available in the Nonlinear Optics group at the Institute of Applied Science – University of Bern.

The NLO group exploits ultra-short light pulses at THz and MIR frequencies to investigate and manipulate the properties of “quantum materials” that manifest collective quantum behaviors over a wide range of temperatures. In these systems, intense laser pulses provide access to the structural, spin, and electron dynamics on their intrinsic timescales, enabling in-depth investigation of the underlying complex out-of-equilibrium physics.

The postdoctoral research will involve the development of advanced laser-based optical techniques to generate high-field THz pulses for the investigation of ultrafast dynamics in quantum materials, with a particular focus on novel low-dimensional antiferromagnets. Complementary experiments on light-driven quantum materials using ultrafast X-ray probes at the X-ray free-electron lasers are also expected.

Your tasks:

- Develop advanced laser-based optical techniques to generate high-field THz pulses by optical rectification in organic crystals
- Design and conduct ultrafast time-resolved experiments on low-dimensional antiferromagnet using table-top laser sources and potentially expand experiments to exploit X-ray free-electron lasers
- Write reports and publications, creating presentations, and presenting talks and posters, including at international conferences
- Collaborate with external research teams and take part in all tasks relevant to the project

Your profile:

- A Ph.D. in Physics, Materials Science, or a closely related field, with a strong background in ultrafast optics, nonlinear optics, or condensed matter physics
- Experience in ultrafast spectroscopy of solids
- Experience in the generation and application of THz pulses and optical parametric amplifiers is highly desirable
- Ability to work both independently and collaboratively within a research team
- Excellent communication skills in English, both written and verbal

We offer you:

- Access to state-of-the-art research equipment, including femtosecond Ti:Sa laser amplifier, optical parametric amplifier, and optical cryostat. Possibility to perform experiments at large-scale facilities, including SwissFEL at Paul Scherrer Institute.
- Opportunity to work independently and as part of a highly motivated team, in close contact with researchers of the institute and international collaborators
- An excellent and stimulating research environment to grow both academically and professionally

If you are interested, please send your CV along with a brief description of your research interests to Dr. Flavio Giorgianni at flavio.giorgianni@unibe.ch and Prof. Dr. Adrian Cavalieri adrian.cavalieri@unibe.ch. The position is available from September 2024, with some flexibility regarding the exact start date.

For more information about the project, please contact Dr. F. Giorgianni or Prof. A. Cavalieri