Researcher positions are available in SYLOS GHHG Attosources Group of ELI ALPS

ELI ALPS (https://www.eli-alps.hu/), part of the Extreme Light Infrastructure (ELI), is a world-leading research facility in Szeged, Hungary, dedicated to studying ultrashort high energy processes. As one of the three pillars of this European megaproject, ELI ALPS provides cutting-edge ultrashort light sources, including attosecond XUV and X-ray pulses for the scientific community, enabling groundbreaking research in light–matter interactions, valence and core electron science, materials science, 4D imaging, and various biomedical applications.

We are looking for an enthusiastic and skilled candidate with expertise in high-harmonic generation (HHG)/attosecond physics/atomic, molecular and optical (AMO) physics (or closely related disciplines) to participate in various projects managed by the SYLOS GHHG Attosources Group of ELI ALPS. In addition to contributing to designing, building and commissioning various pieces of equipment, the candidate is expected to take part in user support during the use of beamlines and end-stations. In this permanent position, the candidate will also have the possibility to conduct own research.

Description of the SYLOS GHHG Attosources Group

The SYLOS GHHG Attosources Group of ELI ALPS maintains two gas-based high harmonic generation beamlines (COMPACT and LONG) [1-6] driven by the two-cycle, 1 kHz, TW-class SYLOS laser. The beamlines are dedicated to the study of nonlinear XUV processes by the XUV–XUV pump–probe technique with attosecond time resolution, which has so far been achieved only in a few laboratories worldwide. In addition to comprehensive diagnostics, the scientific equipment includes various time-of-flight spectrometers, a liquid jet setup, a cold particle source and an ion microscope to enable the study of multi-photon many- body processes.

[1] S. Kuhn et al., J. Phys. B: At. Mol. Opt. Phys. 50, 132002 (2017)
[2] M. Shirozam et al. Ultrafast Science, 4, 0067 (2024)
[3] B. Nagyilles et al. Physical Review Applied, 20, 5, 054048 (2023)
[4] E.Appi et al. Optics Express, 31, 20 (2023)
[5] M. Stanek et al. Applied Physics Letters 125, 9 (2024)
[6] I. Orfanos et al. Physical Review A, 106, 4 (2022)

What you will do:

The work tasks of the Research Fellow to be hired in the SYLOS GHHG Attosources Group include but are not limited to the following:

- Contribute new ideas and implement them within the R&D scope of the equipment, advancing pump–probe experiments in the temporal and spectral domain.
- Participate in the upgradation and functional improvement of the above equipment to enhance its scope and versatility for accommodating diverse scientific experiments.
- Support international user experiments during the preparation, execution and interpretation phase.
- Contribute to the development of a vision of projects that could be implemented in line with the scientific goals of the group and ELI ALPS, using the available infrastructure, e.g. generation and characterization of circularly polarized light in the XUV regime and/or time-resolved imaging, establish regular non-linear XUV photoionization processes etc.

What we expect:
The candidate should hold a PhD or MSc degree – for a postdoctoral or predoctoral position, respectively – in physics, chemistry or other related scientific field. (Applications of candidates on track to complete their PhD are also considered.) The seniority of the position would be decided by paying due weight to the experience and scientific profile of the candidate.

Desired skills and abilities:

- Experience in HHG, attosecond physics, AMO physics or related research fields.
- Good technical knowledge in conducting time-resolved measurements, operating vacuum systems and characterizing ultrashort infrared or extreme ultraviolet pulses.
- The successful candidate is expected to have the ability to work both independently in the lab and as part of a team.
- Good written and oral communication skills in English.

Additional preferred qualifications:

- Good programming skills (Python, Matlab).
- Experience with ultrafast (femtosecond) lasers and ultrafast optics.
- Ability to lead a (research) project alone.
- Experience in projects where people from different disciplines (physics, engineering, IT) work together.

Job location: Hungary, Szeged

Start time: As soon as reasonable

Why join us?

- **International collaborations:** Our team frequently engages in international scientific collaborations with both experimental and theoretical areas, offering excellent opportunities to expand your global network and engage in pioneering research with experts in the field.
- **Cutting-edge facility:** ELI ALPS is part of the Extreme Light Infrastructure (ELI) project, providing access to some of the most advanced research tools in the world. ELI ALPS provides cutting-edge ultrashort light sources, including attosecond XUV and X-ray pulses, for the scientific community.
- **Quality of life:** We offer very competitive salaries in regional comparison, and the city of Szeged provides pleasant living conditions.

Apply now:
For further scientific elaboration and informal discussion on these two positions please contact Dr. Zsolt Diveki at zsolt.diveki@eli-alps.hu with your CV and motivation letter.

If you are interested in the position, please upload your CV (including a list of publications and at least two references) and motivation letter merged into a single PDF file to our Career Site at https://www.eli-alps.hu/en/Career-1 .

Extreme Light Infrastructure ERIC / ALPS Facility / ELI-Beamlines

The Extreme Light Infrastructure (ELI ERIC) is the world's largest high-power laser research facility, offering cutting-edge lasers for groundbreaking science and innovation. Operating across two sites – ELI Beamlines in the Czech Republic (near Prague) and ELI ALPS in Hungary (Szeged) – it employs a diverse team of experts from around the globe.

ELI Beamlines operates four advanced femtosecond laser systems, delivering unmatched intensities. These lasers drive unique X-ray and particle sources for groundbreaking research in physics, chemistry, materials, life sciences, and astrophysics.

ELI ALPS operates lasers and secondary sources to deliver ultrafast light pulses (including attosecond pulses) for pioneering research in physics, chemistry, materials and life sciences. Its advanced systems enable exploration of ultrafast electron dynamics and complex molecular processes.