



## Researcher position available in the 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 researcher with expertise in handling vacuum compatible liquid jets, 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 also expected to take part in user support during the use of beamlines and end-stations in this permanent position.

### 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) [1,2] driven by the 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 cold particle source and an ion microscope, and will soon be joined by a reaction microscope (ReMi or COLTRIMS) to enable the study of multi-photon many-body processes. The group plans to acquire, maintain and exploit a vacuum compatible liquid jet setup for studying attosecond dynamics in the liquid phase of the matter.

[1] S. Kuhn et al., J. Phys. B: At. Mol. Opt. Phys. 50, 132002 (2017)

[2] M. Shirozhan et al. Ultrafast Science 4, 0067 (2024)

### What you will do:

The tasks of the new colleague to be hired include but are not limited to the following:

- Participating in the maintenance and operation of various pieces of equipment for ultrafast physics studies in gas, liquid and condensed phases on the Sylos GHHG beamlines.
- Participating in the design, procurement, operation and maintenance of a vacuum compatible liquid jet target designed for strong field studies.



- The candidate will have the possibility to conduct own research when beamtime is available.

**What we expect:**

The candidate should hold at least an MSc in physics/chemistry, or in one of the following studies: laser engineering, optics, photonics, high harmonic generation (HHG), attosecond physics, and atomic, molecular and optical (AMO) physics (or closely related disciplines) or any other related scientific field. The candidate is expected to have a vision of projects that could be implemented using the available infrastructure.

**Skills and abilities:**

- Exposure to ultrafast (femtosecond) lasers and ultrafast optics.
- Experience in vacuum handling.
- 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.
- Experience in preparation of liquid targets (solvents).
- 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 this positions please contact Dr. Subhendu Kahaly at [subhendu.kahaly@eli-alps.hu](mailto:subhendu.kahaly@eli-alps.hu) and Dr. Zsolt Diveki at [zsolt.diveki@eli-alps.hu](mailto: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.