Laser Scientist / Research Fellow position in the Terahertz Sources Group at ELI ALPS

The international laser user facility Extreme Light Infrastructure (ELI) is one of the world's largest advanced infrastructures in high-power, high-intensity, and short-pulse laser systems. The lasers at ELI produce ultrashort pulses of photons, electrons, protons, and neutrons and enable the investigation of light-matter interactions at the highest intensities and shortest time scales for a broad scope of fundamental and applied research. ELI is established as a European Research Infrastructure Consortium (ERIC), which now operates two facilities: ELI ALPS in Szeged, Hungary and ELI Beamlines near Prague, the Czech Republic. ELI Attosecond Light Pulse Source (ELI ALPS) is a unique attosecond facility; it provides ultrashort light pulses from terahertz (THz) to x-ray frequencies with high repetition rates for users and developers.

The Terahertz Sources Group at ELI ALPS develops and operates strong-field THz sources, spectroscopic tools, and metrology for the investigation of THz-field-driven dynamics in matter. We study a broad range of materials and structures exposed to extreme THz fields, electron emission from surfaces and atoms driven/assisted by THz waveforms, and explore the biological effects of intense THz radiation. The nonlinear spectroscopic techniques include pump–probe schemes with THz, optical, and extreme ultraviolet (XUV) pulses. The group is responsible for user service and scientific applications at the Nonlinear Terahertz Spectroscopy Facility (NLTSF), the High-Energy Terahertz (HE-THz) facility, and for the development of an experimental station for THz pump—attosecond XUV probe studies. The THz facilities are pumped by advanced femtosecond laser systems of high pulse energy and average power.

What you will do:

The successful candidate will lead the laser support for the strong-field THz programme at ELI ALPS. The responsibilities include operating the advanced driver lasers; contributing to, or leading the upgrades of the laser systems; characterizing optical pulses and beams; and developing nonlinear pulse conversion techniques. The successful candidate will interact with and support external and internal users; contribute to the development and operation of the experimental stations; contribute to in-house research projects, carry out experiments, analyze the results, and contribute to publications. He/she will have the possibility to conduct own research, aligned with the research directions of the group, upon successful ELI ERIC beamtime or research grant application. A vision of projects that could be carried out with

the available infrastructure is expected. Close collaboration with the Laser Sources Division and participation in THz experiments is expected.

What we expect:

We are looking for a skilled and enthusiastic researcher with hands-on laboratory expertise in one or more of the following fields: high-energy or high average power ultrafast laser physics; solid-state chirped-pulse amplifier development; ultrafast pulse characterization and/or post-compression techniques; or other related areas. The successful applicant must have broad practical knowledge of ultrafast high-power pulse generation, amplification, propagation, and manipulation. We expect candidates with a PhD in physics, laser engineering, optics, photonics, or any other related field. Candidates who will complete their PhD studies in the near future and candidates with at least 5 years of experience in the field of laser physics and/or laser engineering, together with a demonstrated record in research will be considered, too. The successful candidate should be able to work in a team, as well as independently. Good English communication skills, verbal and written, and excellent interpersonal skills are requested.

The following qualifications are of advantage:

- experience with THz techniques;
- good programming skills;
- experience with data analysis and simulation or ray-tracing tools;
- experience in leading a research project or task;
- experience in supervising students;
- experience in projects where people from different scientific disciplines, engineering, and IT work together.

What we provide:

We offer an exciting scientific environment in a new European research institute. This globally unique laser-based scientific infrastructure enables research in a wide range of scientific areas. There is excellent possibility for collaborations through close interaction with a user community and cooperation partners from all corners of the world. We offer a challenging and versatile job in a friendly international team with career opportunities, competitive salary in regional comparison, full-time, fixed-term employment, which can be extended, cafeteria and private health insurance benefits, and a family-friendly workplace. The job location is Szeged, Hungary. The city of Szeged offers pleasant living conditions and leisure opportunities.

Your application:

Interested? Please upload your motivation letter, CV, and publication list to our Career Site at www.eli-alps.hu/en/Career-1. The application is open until the position is filled. Preferred starting date is 1 July 2025.

For further information on ELI ALPS, please visit the www.eli-alps.hu website. For position-related information, please contact the leader of the Terahertz Sources Group, József Fülöp (email: Jozsef.Fulop@eli-alps.hu).

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) – employing a diverse team of experts from around the globe.

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

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.