

The Extreme Light Infrastructure (ELI) project is an integral part of the European plan to build the next generation of large research facilities identified and selected by the European Strategy Forum on Research Infrastructures (ESFRI). ELI is the first infrastructure in the world able to investigate interactions between light and matter with the highest intensity, in the so-called ultrarelativistic range. It will open a doorway into new territories within physics and establish new technical developments such as relativistic microelectronics and small laser particle accelerators. ELI will have a considerable impact on numerous fields of material sciences, medicine and environmental protection.

## **Laser Operator positions are available in the Laser Sources Division of ELI-ALPS**

We are looking for enthusiastic and skilled physicists or engineers with practical expertise in laser physics, especially with hands-on experience in the operation and maintenance of high energy ultrafast laser systems. The successful candidates will work as part of the laser team in an international and interdisciplinary scientific environment by supporting various research projects of external user groups on ELI-ALPS beamlines.

### **Description of the Laser Sources Division at ELI-ALPS**

#### **Our Mission:**

Here at ELI-ALPS (<https://www.eli-alps.hu/>) we offer beamtime for external research applications which require state-of-the-art attosecond and femtosecond pulsed laser technologies. Our main goal is to provide the shortest possible light pulses at the highest available average power for the scientific community.

The Laser Sources Division is responsible for the operation of all laser systems in order to drive the attosecond beamlines, end-stations and individual user experiments with the requested beam parameters, including pulse energy, beamsize, polarization state, pulse duration, CEP etc. specified for a given research project.

Other scientific activities within the Laser Sources Division include

- research towards further pulse shortening via post-compression techniques at all available wavelengths at ELI-ALPS,
- laser pulse metrology developments at high repetition rates and average powers, and
- advancement in new sources (UV, VIS, far IR) with few-cycle durations and CEP stability.

#### **Technologies:**

- High average power and high repetition rate (100 kHz) ultrafast fibre laser systems: HR1 under development in Szeged, HR2 under development in Jena. These unique few cycle laser systems deliver few mJ, CEP stabilized, near-infrared pulses for gas harmonic attosecond beamlines.

- Mid-infrared and high repetition rate ultrafast OPCPA systems: MIR (100 kHz) and MIR-HE (1 kHz, under preparation). Wavelengths around 3  $\mu\text{m}$  sub-two-cycle pulse duration with exceptional CEP stability and control for various experimental applications.
- High peak power, near-single cycle 1 kHz OPCPA systems: SYLOS 2, SYLOS 3 (under development in Vilnius) and SYLOS Experiment Alignment. CEP-stabilized, near-infrared pulses with excellent overall stability features. The most versatile systems for gas and surface harmonic attosecond beamlines and electron and proton acceleration.
- High repetition rate PW laser: Ti:sapphire-based HF PW laser (under development in Szeged). The only 2 PW peak power system at 10 Hz repetition rate, which delivers 34 J with 17 fs for surface harmonics attosecond beamlines and particle acceleration.
- THz pump lasers: high pulse energy systems with moderate pulse durations designed specifically to drive high energy THz pulse generation and THz spectroscopy applications.

#### **Duties and Responsibilities:**

The work tasks of the Laser Operators to be hired in the Division include but are not limited to the following:

- Acquiring knowledge of the start-up and shutdown procedures, operation and regular maintenance of MIR, HR1, HR2, SYLOS2, SYLOS Experiment Alignment and THz pump laser systems.
- Learning the specific know-hows to assist the experimental work in MIR, HR1, HR2, SYLOS2, SYLOS Experiment Alignment and THz laboratories during user-related experimental activities.
- Participating in the characterization of laser pulses at experimental stations.
- Participating in the design and building/assembly of additional equipment managed by the Laser Sources Division.
- Supervision of the operating lasers during internal and external user experiments.
- Organization of a duty plan for the operation of all lasers.
- The successful candidates will have the possibility to carry out research within internal scientific project and obtain their PhD during the process.

#### **Minimum education and experience:**

The candidates must hold an MSc in physics, laser engineering, optics, photonics or other related scientific field. Demonstrated experience of 2 years in laser laboratory works, preferably in the daily operation, basic maintenance and use of laser systems is required.

#### **Required skills and abilities:**

- the successful candidates must be able to work as part of a scientific support team, but also have the ability to handle tasks independently in the laboratory,

- practical knowledge of high power, ultrafast pulse generation, amplification, propagation and manipulation,
- experience with ultrafast pulse characterization methods,
- good written and oral communication skills in English.

**Additional preferred qualifications:**

- hands-on experience with both solid-state-based and optical parametric amplifiers,
- good practical problem-solving skills, being eager to acquire new knowledge,
- good programming skills (Python, Matlab, etc.),
- experience with ray tracing software (e.g. Zemax),
- good written and oral communication skills in Hungarian.

**What we can offer:**

- challenging tasks and room for career advancement while working with cutting-edge technology in an international scientific environment,
- competitive benefit package in regional comparison,
- flexible working hours,
- very attractive standards of living in a socially vibrant city.

**Job location:**

Hungary, Szeged

If you are interested in the position, please upload your CV and motivation letter to our Career Site at <https://www.eli-alps.hu/en/Career>.