A Research Fellow (Early-career scientist or postdoc) position is available in the Particle Acceleration Group within the Secondary Sources Division of ELI ALPS

The main mission of the Secondary Sources Division is to generate XUV attosecond pulses, coherent X-ray beams, charged particle and THz beams at the highest possible repetition rate and pulse energy – and some of their combinations – with cutting-edge parameters for user experiments, as well as for scientific and industrial applications in various fields of ultrafast and attosecond sciences. The capacities offered are complemented with advanced, state-of-the-art experimental endstations such as a NanoEsca, two reaction microscopes, a liquid jet endstation, a VMI endstation, several radiation and particle spectrometers and surface science apparatuses.

Furthermore, the division pursues active research to enhance the capabilities of ultrafast radiation pulses and particle sources beyond the state of the art; develop relevant diagnostics, define associated metrology and guide applications; and to address challenging scientific questions on laser-driven XUV high-harmonics, coherent X-rays, THz radiation generation; charged particle acceleration and their optimal spatio-temporal control.

What you will do:

Our new colleague will be assigned to the Particle Acceleration Group, responsible for the implementation of the laser-driven electron acceleration programme at ELI ALPS (commissioning, user operation etc.), where electron acceleration is achieved via the Laser Wakefield Acceleration mechanism (LWFA). You are hired to conduct research and development of the LWFA electron beamlines (eSYLOS and ePW) and their applications through

- Commissioning ramp-up experiments and ELI ERIC user experimental campaigns;
- Design/development of instrumentation/diagnostics relevant to these electron beamlines;
- Experimental data analysis and development of data analysis software.

Moreover, the new colleague is expected to participate in the preparation of peer-reviewed journal publications, as well as in conferences/workshops/meetings and other activities in line with the duties of the Group and the Division.

What we expect:

For the Early-career scientist position: We require BS/MS degrees with a very strong GPA in Physics, Optics or Optical Engineering (or related areas) from a recognized university.

For the postdoc position: A PhD degree (or a PhD degree to be awarded by the date of employment, i.e. 1 July 2025) or at least 10 years of research experience in one of the following fields:

- High-intensity ultrashort laser-plasma interactions;
- LWFA experiments;
- LWFA-related electron beam and betatron X-ray diagnostics and control software;
- LWFA-related applications;
- The applicant must have an excellent publication record in peer-reviewed journals, commensurate with the career stage.
- Moreover, he/she must demonstrate good written and verbal English communication skills and should have excellent interpersonal skills as he/she will be required to interact with an international user community.

The following additional skills/experience will be highly valued:

- PIC simulations on LWFA;
- 3D CAD design;
- Analytical/numerical and programming experience (Matlab, LabVIEW, Python).

In return we will provide you with:

- Full-time employment for a fixed term;
- A challenging job with career opportunities;
- A competitive salary;
- Cafeteria and private health insurance benefits;
- The opportunity to work in an international institution in a friendly and diverse environment;
- Support to leisure time activities and teambuilding events;
- A family-friendly workplace.

The application must contain:

- A Europass curriculum vitae or detailed scientific curriculum vitae;
- Full list of publications – highlighting the articles published in refereed journals and containing the following data:
  - h-index
  - cumulative impact factor (calculated by summing the impact factors of journals characteristic for the year of publication of each article)
  - number of citations without self-citations
- A motivation letter;
- The name and email addresses of two scientific supervisors or professors, who could give expert opinion about the applicant's skills;
- The applicant's postal address and other contact data (phone and e-mail).

Other information:

- Application deadline: open until filled
- Preferred starting date: 1 April 2026
- Foreseeable date of the interview for shortlisted applicants: within several weeks of application submission (only shortlisted applicants will be contacted)

For further information on ELI ALPS, please visit the ELI ALPS website (http://www.eli-alps.hu), while for position-related information, please contact the Leader of the Particle Acceleration Group at ELI ALPS, Dr. Nasr A. M. Hafz (Hafiz) at this email address: nasr.hafiz@eli-alps.hu
Applications should be submitted via our career portal site: https://www.eli-alps.hu/en/Career-1

About 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 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.