



The European Spallation Source (ESS) will be a multi-disciplinary research centre and the global leader in its field. ESS will open new windows in a large range of scientific disciplines. The goal of the ESS Scandinavia initiative is to promote the construction of the ESS in Lund. If realised, the ESS will be the world's premier neutron source, providing scientists with unique and powerful neutron scattering tools to study the properties of materials and molecules: knowledge essential to growth in strategic areas such as nanotechnology, hardware for information technology, energy technology, life science and biotechnology. Since 1993, the scientific and technical case for the ESS has been developed by the ESS Council, an organisation set up by 18 large laboratories in 11 different countries.



Founded in Geneva in 1954, CERN (the European Organization for Nuclear Research) is the world's most advanced fundamental research centre for particle physics. Over the past 50 years it has become a prime example of international collaboration and is currently supported by 20 European Member States, attracting more than 6000 visiting scientists and engineers from over 80 countries.

CERN is just starting the operation of the Large Hadron Collider (LHC), the world's biggest and most powerful particle accelerator. In a tunnel 27 km in circumference, beams of particles will collide at a speed close to the speed of light. By studying these collisions at higher energies than ever before, physicists working at the LHC will make further progress in understanding the mysteries of how our Universe is made and how it came into being.



LUND
UNIVERSITY

Lund University, founded in 1666, is Scandinavia's biggest university, offering education and research in the fields of technology, natural science, law, social science, economics, medicine, the humanities, theology, art, music and the performing arts. The University has over 39,000 students and approximately 5,500 employees, mainly in Lund, Malmo and Helsingborg.

As part of the ongoing cooperation between ESS Scandinavia and CERN, the University of Lund is looking for qualified persons to fill the following four positions:

Research fellow/engineer in RF system studies for the CERN SPL

Ref. No.: ESSS 2008/28

Description:

This activity falls within the framework of studies on high-intensity linear accelerators at CERN. It specifically concerns the design of high-power equipment for RF structures used to accelerate particle beams, including ferrite-based phase and amplitude shifters, wave-guide splitters and the wave-guide distribution network. The work will involve

theoretical studies, simulations using RF design tools and participation in the construction and testing of prototype equipment.

The successful candidate will have a background in electrical or electronic engineering with a special interest in high power RF. He or she will be required to become familiar with the operation and design of linear accelerators.

The work will form part of the preparatory activities for the realisation of the European Spallation Source, for which Lund is a prime candidate.

Qualifications:

Engineering degree, or higher, in electrical or electronic engineering or physics.

Good knowledge of RF theory. Previous experience of RF design and the use of simulation tools would be an advantage.

The following applies to the position:

The employer will be the University of Lund.

Excellent oral and written English is essential; knowledge of French, Swedish and other European languages would be an advantage.

Experience of working in a multi-cultural and multi-lingual environment in the framework of international collaborations is essential.

Selected candidates may be required to travel to locations other than CERN and ESS Scandinavia and to carry out research assignments of varying duration in these locations.

All positions will be subject to a two-year contract, which may be extended.

During the first two years, the selected candidates will spend approximately 90% of their time at CERN and 10% in Lund, not including attendance at conferences, etc.

Research fellow/engineer in beam dynamics studies for the CERN SPL

Ref. No.: ESSS 2008/29

Description:

This activity falls within the framework of work on high-intensity linear accelerators at CERN. It will involve calculations in both beam dynamics and electrodynamics. The successful candidate will be required to become familiar with the physics, mathematics and computational aspects of tracking a bunch of charged particles in an electric and magnetic field, with special emphasis on high-intensity beam issues (space charge, halo formation, loss minimisation). He or she will work on the optimisation of the layout of the SPL (Superconducting Proton Linac) with respect to the choice of frequency, structure and beam performance, as well as on the application of this technology to the design of the ESSS accelerator.

The work will form part of the preparatory activities for the realisation of the European Spallation Source, for which Lund is a prime candidate.

Qualifications:

Engineering degree, or higher, in physics, with good knowledge of electromagnetism and electrodynamics. Sound computing experience. Previous experience of particle accelerators would be an advantage.

The following applies to the position:

The employer will be the University of Lund.

Excellent oral and written English is essential; knowledge of French, Swedish and other European languages would be an advantage.

Experience of working in a multi-cultural and multi-lingual environment in the framework of international collaborations is essential.

Selected candidates may be required to travel to locations other than CERN and ESS Scandinavia and to carry out research assignments of varying duration in these locations.

All positions will be subject to a two-year contract, which may be extended.

During the first two years, the selected candidates will spend approximately 90% of their time at CERN and 10% in Lund, not including attendance at conferences, etc.

Research fellow/Engineer in Applied Physics

(ESS-Scandinavia Target R&D)

Ref. No.: ESSS 2008/30

The successful candidate will participate in the EURISOL Design Study in the context of the 6th European Research Framework Programme (Infrastructures) with the objective of reviewing the existing ESS liquid metal target design. The main goal of this study is to produce a Conceptual Design Report (CDR) on the target station, with particular focus on its most technologically advanced aspects. In this context, close collaboration with the CERN AB-ATB group is highly desirable.

Functions

The successful candidate will be required to:

- Work on the conceptual design of a liquid metal target able to accommodate up to 5 MW of pulsed proton power for the ESSS project;
- Assist in the engineering design of a liquid Hg target able to accommodate up to 4 MW of CW proton power for the EURISOL-DS project;
- Carry out engineering studies on the behaviour of materials for beam interception devices under extreme conditions.

This will involve:

- Setting-up and implementation of computational fluid dynamics and thermo-mechanical calculations (structural and thermo-fluid-dynamics analysis of multi-MW liquid metal targets) for the investigation of fatigue, shock behaviour and component lifetime under normal conditions and in the event of an accident or incident.
- Setting-up and implementation of the off-line testing of prototypes in the liquid Hg-loop at IPUL, Riga (Latvia);
- Participation in the development of the CERN ELSE code. In particular, in mesh-less and particle methods, such as SPH, it would be very useful to have a numerical tool, complete with a source code and integrated with a FLUKA code, capable of analysing liquid targets, jets and sprays.

The work will form part of the preparatory activities for the realisation of the European Spallation Source, for which Lund is a prime candidate.

Qualifications:

Engineering degree, or higher, in physics, with good knowledge of electromagnetism and electrodynamics. Experience in the field of spallation neutron sources and the development of related technology is desirable, as well as good practical knowledge of computing and computer simulation codes for both computational fluid dynamics (ANSYS-CFX, STARCD, etc...) and thermo-structural analysis (ANSYS, AUTODYNE, LS-DYNA, etc.).

The following applies to the position:

The employer will be the University of Lund.

Excellent oral and written English is essential; knowledge of French, Swedish and other European languages would be an advantage.

Experience of working in a multi-cultural and multi-lingual environment in the framework of international collaborations is essential.

Selected candidates may be required to travel to locations other than CERN and ESS Scandinavia and to carry out research assignments of varying duration in these locations.

All positions will be subject to a two-year contract, which may be extended.

During the first two years, the selected candidates will spend approximately 90% of their time at CERN and 10% in Lund, not including attendance at conferences, etc.

Research fellow / Engineer in Neutronics calculations

Ref. No.: ESSS 2008/31

The successful candidate will perform neutronics calculations for the European Spallation Source as a member of the EET section of the AB/ATB group.

He or she must have basic knowledge of nuclear physics and, in particular, of neutron and proton interactions in the energy range from thermal to a few GeV. He/she should also have some experience in using complex computational tools and knowledge of programming languages.

Under the supervision of the senior physicists of the ATB/EET section, the successful candidate will be responsible for performing Monte Carlo calculations aimed at:

- optimisation of the target with respect to the neutron yield and spectrum, in terms of materials, layout and, more generally, its global design;
- evaluation of beam-induced loads in consultation with the engineers in charge of the hardware design;
- consideration of the moderator needed close to the target to generate low energy neutron beams.

The work will form part of the preparatory activities for the realisation of the European Spallation Source, for which Lund is a prime candidate.

Qualifications:

Engineering degree, or higher, in physics.

Previous knowledge of low energy neutron transport codes and/or codes capable of describing spallation reactions and following their products would be an advantage.

The following applies to the position:

The employer will be the University of Lund.

Excellent oral and written English is essential; knowledge of French, Swedish and other European languages would be an advantage.

Experience of working in a multi-cultural and multi-lingual environment in the framework of international collaborations is essential.

Selected candidates may be required to travel to locations other than CERN and ESS Scandinavia and to carry out research assignments of varying duration in these locations.

All positions will be subject to a two-year contract, which may be extended.

During the first two years, the selected candidates will spend approximately 90% of their time at CERN and 10% in Lund, not including attendance at conferences, etc.

The following applies to all four positions:

For further information please contact Deputy Director for projects, Dr Patrik Carlsson
Phone: +46 46 222 3973, E-mail: patrik.carlsson@esss.se or Visiting Professor, Dr Mats Lindroos
Phone: +41 22 767 3859, E-mail: mats.lindroos@cern.ch

Information regarding ESS Scandinavia is available at our website: www.esss.se.

Gender balance is a strong issue at Lund University and we encourage both men and women to apply for this position.

Applications should be sent to the Vice-Chancellor, Lund University, PO Box 117, 221 00 Lund, Sweden, or by mail to: registrator@legal.lu.se, and must be received by the Registrar by 31st of October 2008 at the latest.

Please state the vacancy reference number on your application.