

The
NUCLEAR PHYSICS INSTITUTE
OF THE CZECH ACADEMY OF SCIENCES
is looking for

3 Post-Docs
in the field of neutron imaging and diffraction

your tasks

- software development for the analysis of time-of-flight neutron imaging and neutron diffraction data
- contribution to the software platform for the engineering diffractometer BEER at the European Spallation Source ESS
- planning and conducting experiments at neutron sources worldwide
- close collaboration with institutes in Sweden, Denmark, Switzerland, Germany, United Kingdom and Japan

your profile

- PhD in physics, materials science, engineering, applied mathematics or related fields
- programming experience: preferably C, C++, python
- experience/interest in neutron imaging and neutron diffraction

For further information contact:

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EUROPEAN SPALLATION SOURCE (ESS)



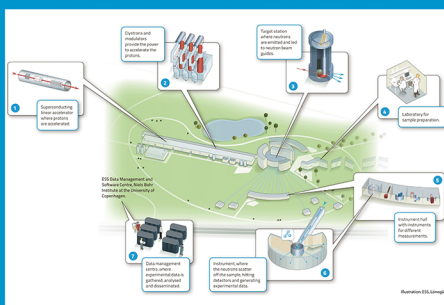
Hosting institution: Nuclear Physics Institute (NPI), CAS

<http://ujf.cas.cz>

Responsible person: Petr Lukáš, lukas@ujf.cas.cz

annotation

ESS ERIC is a consortium of European countries cooperating on the design and construction of one of Europe's largest research infrastructure projects. The neutron source ESS, European priority project from the ESFRI Roadmap, part of the Roadmap of Large Infrastructures for Research, Experimental Development and Innovation of the Czech Republic, located in Lund – Sweden, will be a prominent part of the future landscape of European research infrastructures, providing experimental possibilities to researchers from academia as well as industry. Neutron scattering can be applied to a range of scientific questions, spanning the realms of physics, chemistry, geology, biology and medicine. Czech Republic has been participating in the ESS project since its early beginning. The Ministry of Education, Youth and Sports (MEYS) as a guarantee of the Czech membership in the ESS intends to contribute to the ESS construction budget up to 2%, mostly in the form of in-kind contributions. In such a way, the Czech scientific community will gain access to future capacity of broad portfolio of cutting-edge experimental facilities on the neutron beams at the ESS. Roughly half of this contribution will be realized in the form of design, construction and installation of the diffractometer BEER (Beamline for European material Engineering Research). The second half of the Czech contribution will be realized in the form of in-kind delivery of technological units related to the cooling of the neutron target system.



public support

ESS – Scandinavia – CZ is supported from different public sources:

- Operational cost and the construction of BEER (Beamline for European material Engineering Research) instrument is supported in collaboration with partners from Helmholtz Zentrum Geesthacht (HZG). NPI will participate in its construction by 50% (MEYS project LM 2015047)

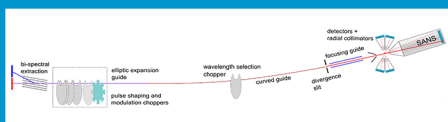
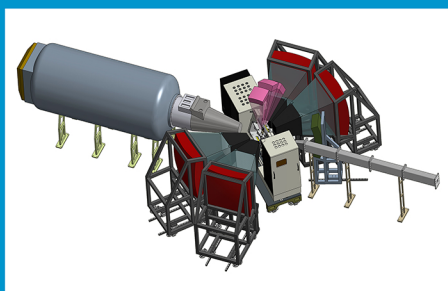
- A project for in-kind investment and own research was submitted under the call No. 02_16_013 for Research infrastructures, priority axis 1 Operational programme research, development and education, MEYS, project name "European Spallation Source – participation of the Czech Republic – OP" , Reg. No. CZ.02.1.01/0.0/0.0/16_013/0001794.

- Related international project: SINE2020 (H2020): Science and Innovation with Neutrons in Europe in 2020.

ESS is under construction, user information will be made known when the first experiments will be planned.

Phase of the large research infrastructure: construction phase

Beamline for European Materials Engineering Research (BEER)



BEER will become a world-leading instrument for engineering applications with several unique features, including very high neutron flux allowing fast dynamical experiments as well as extended flexibility, which allows users to adapt experiment conditions to their needs.

Building of this neutron diffractometer is a joint project of Czech and German in-kind contributions to the ESS. The instrument is unique within the experimental facilities at ESS by its focus on industrial applications. It will enable research in engineering materials with various degrees of complexity as for example in-situ and in-operando experiments for material characterization, thermo-mechanical processing or joining of materials.

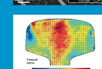
These include studies of phase transformations, residual stresses and textures evolution, precipitates formation and dissolution and other microstructural parameters at industrially relevant thermo-mechanical conditions and time scales.



In-situ thermo-mechanical testing
the deformation mechanisms and microstructure in advanced Mg or TiAl alloys, need to be better understood in order to improve their properties.



Microstructure evolution
simultaneous study of structure, micro-strains and precipitation in advanced materials.



Residual stress analysis
maps of residual stress distributions for assessing the performance of materials in large components under service conditions.



Stress rigs and furnaces
uniaxial and biaxial loading + high and low temperature capability.

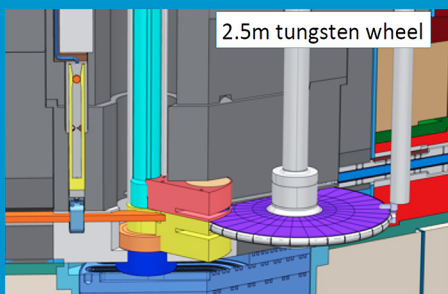


Gleeble
physical simulator of materials processing: very fast heating and deformation capabilities, forging, melting, ...

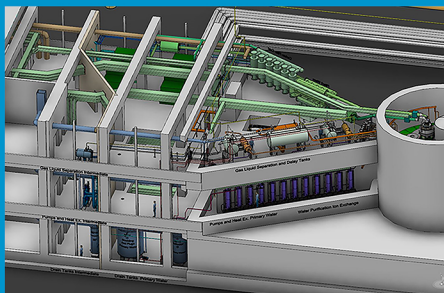


Welding experiments
friction stir welding and laser beam welding.

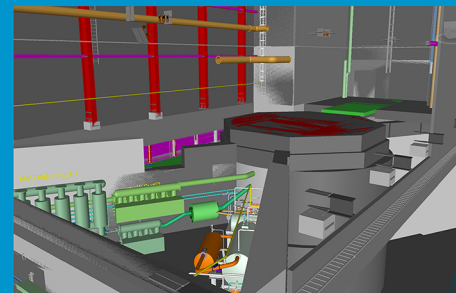
Target station



Target station - a unique concept of helium (He) cooled solid tungsten (W) target. This concept was never realized before in the world.



Helium cooling system of ESS target. This system primary function is to remove heat from the target wheel.



Primary and secondary water cooling system of the target, and heating, ventilation and air-conditioning of the target station.



EUROPEAN UNION
European Structural and Investment Funds
Operational Programme Research,
Development and Education



MINISTRY OF EDUCATION,
YOUTH AND SPORTS



Zentrum für Material- und Küstenforschung



EUROPEAN
SPALLATION
SOURCE



Nuclear Physics Institute of the CAS
public research institution



The Czech Academy
of Sciences