

Randers-Riste Center

The Randers-Riste Center (RRC) aims at establishing a neutron science and knowledge exchange center at IFE in Kjeller in connection to the JEEP II research reactor. The research reactor JEEP II is presently one of the largest experimental facilities in Norway and unique in the sense that it is the only Nordic neutron facility. JEEP II will become a key Scandinavian node to European Spallation Source (ESS), which will be built in Lund, Sweden. ESS will be the world-leading research facility using neutrons for materials research and life science and become one of Europe's largest research centres.

Vision: **To become an internationally renowned center for neutrons in materials science.**



The establishment of the Randers-Riste Center comes in connection with:

Upgrading of the JEEP II research reactor.

Implement continuous operation of the reactor, which today has to stop each time various materials for irradiation are taken in and out. This will increase the overall capacity for measurements and allow time-resolved studies of materials under different physical conditions.

Upgrading of the neutron scattering instruments for materials characterization by techniques.

IFE has started an upgrading and construction of new neutron instruments at JEEP II financed by RCN, UiO and IFE. This will result in the operation of five high quality neutron instruments (neutron powder diffraction, small angle neutron scattering) in the course of 2010. The upgrading will also involve auxiliary equipment to vary the external sample parameters like temperature, pressure, magnetic fields etc

Building a new neutron reflectometer.

Neutron reflectometry allows detailed characterization of surface structure, which is essential for the understanding of how a material interacts with its surroundings. Examples here are many, e.g. coatings to obtain low-wetting surfaces ("lotus leaf effect"), low-friction surfaces to reduce energy consumption, noncorrosive material coatings, energy-collecting surface layers for photovoltaic applications.

The research activities related to RRC will address materials science and nanoscience. Neutron scattering techniques are among the main tools for advanced characterizations, and thus of uppermost importance for development of new materials and for obtaining an improved understanding of their properties. Activities at RRC will be related to the disciplines physics, chemistry, biology, geology, and fields as varied as energy, nanotechnology, materials processing, drug design, green technology and information technology.

The access to a high quality neutron scattering facility connected to JEEP II will have a strong impact on Norwegian research in the field of materials science, physics and chemistry. The beam time will for a large part be made available to scientists from universities, other research institutions, industry and foreign research groups based on joint national and international projects and network participation.