



EUROPEAN  
SPALLATION  
SOURCE

# IFE Physics Department

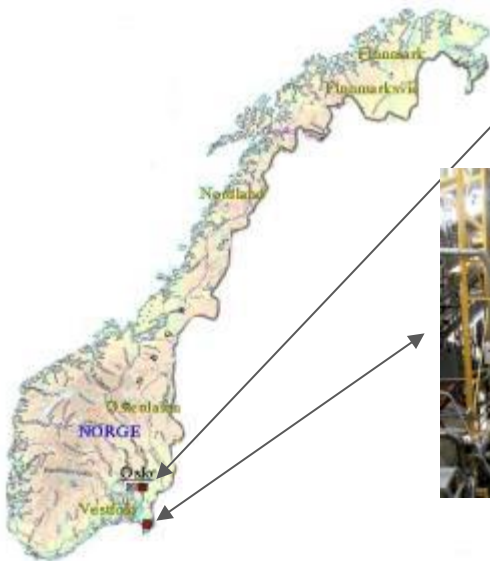
HEIMDAL meeting at PSI, March 2016

# Institute for Energy Technology (IFE), Norway



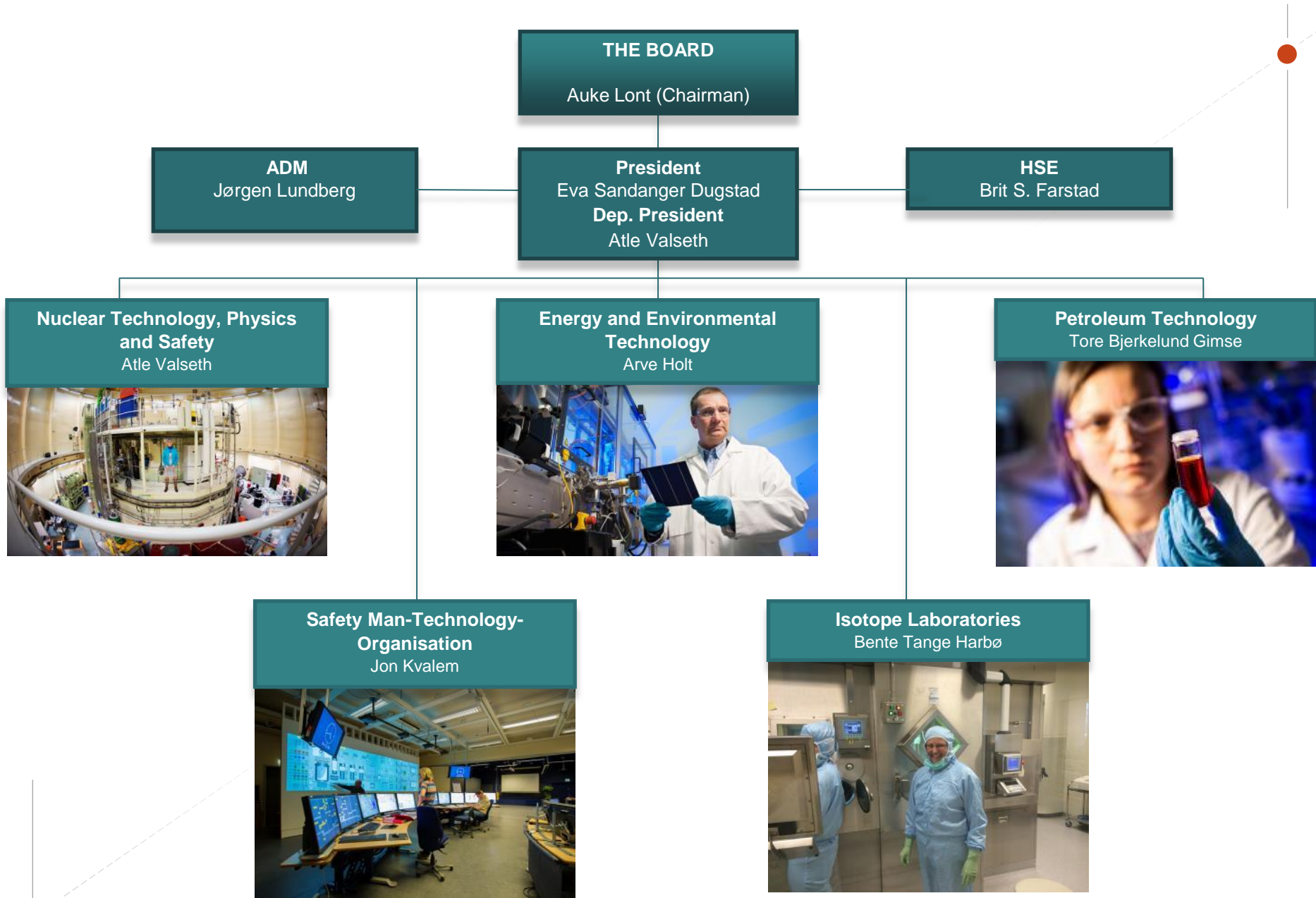
Kjeller

- Independent foundation - established in 1948
- 600 employees
- Turnover: 950 MNOK (100 M€)
- Energy research lab
- 2 research nuclear reactors



Halden





# Physics Department

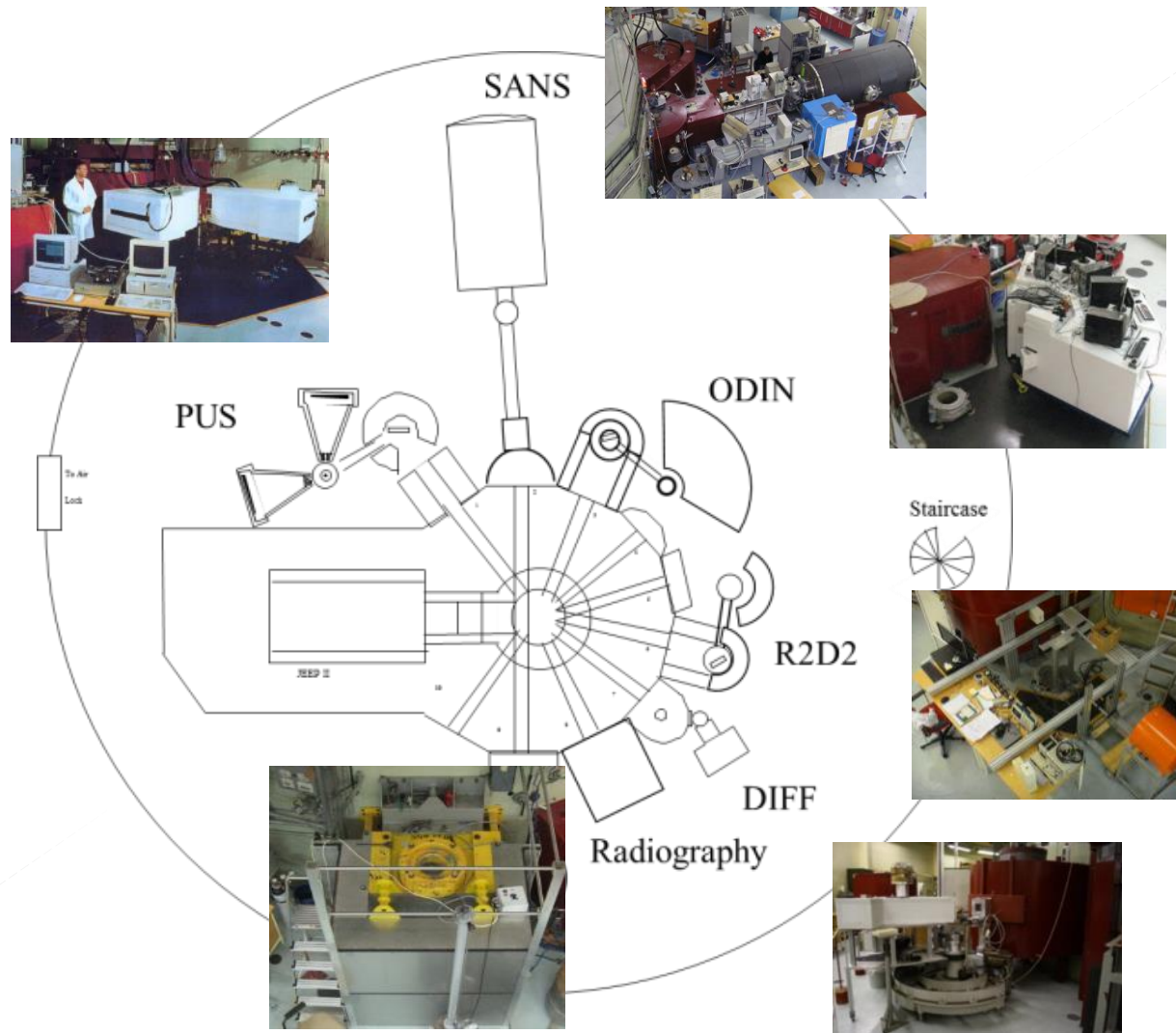
## Main activities:

- Neutron scattering
- Energy materials
  - Hydrogen storage
  - Thermoelectric materials
  - Battery materials
- Magnetic materials
- Soft condensed matter





# JEEP II Existing instrument suite



# Norwegian Center for Neutron Research – NcNeutron

*Funded by Research Council of Norway in the framework  
of the INFRASTRUKTUR program*

- *Responsible Institution:* Institute for Energy Technology
- *Partners:* University of Oslo, SINTEF Materials and Chemistry, University Of Stavanger
- *National Collaborators:* NTNU, SINTEF Byggforsk
- *International Collaborators:* ILL (FR), PSI (CH), ESS (SE)
- *Support from Industry:* Norsk Hydro, Elkem, Norsk Titanium, Benteler Aluminium Systems

# Upgrade of instrument suit: NcNeutron

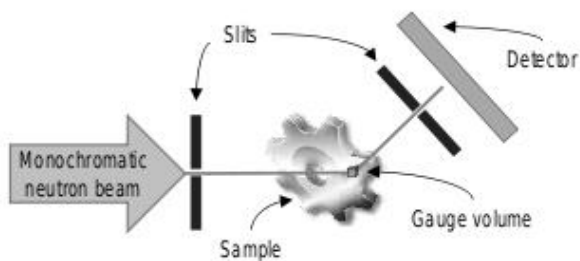


Figure 4.4. Sketch of the residual stress diffractometer.

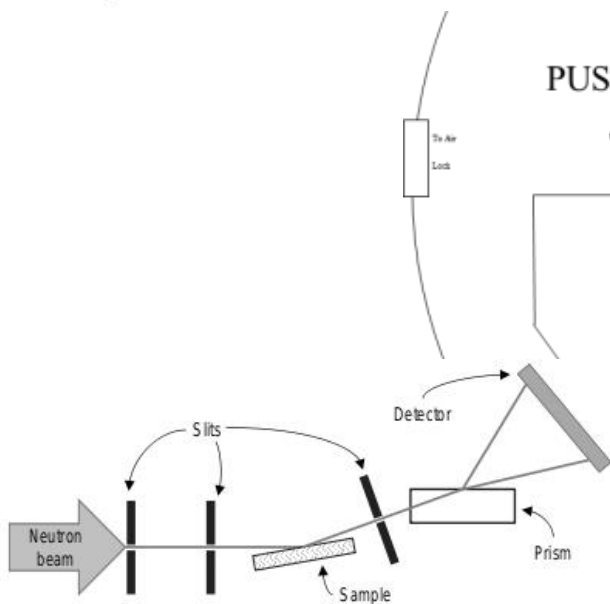


Figure 4.1. Schematic setup for the neutron reflectometer

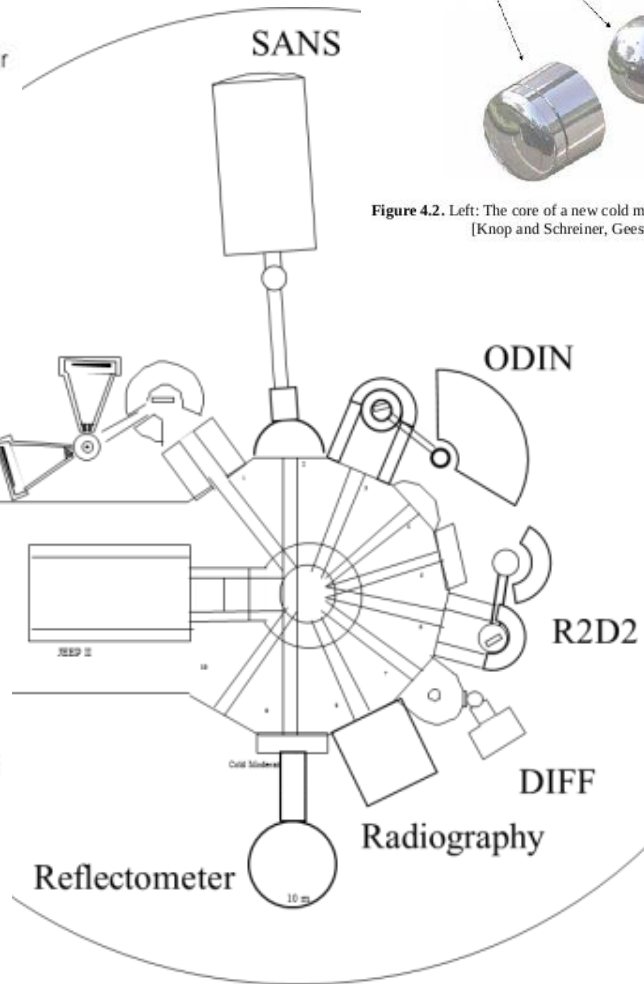


Figure 4.2. Left: The core of a new cold moderator design, a hemispherical container for the moderator liquid  $H_2$ . [Knop and Schreiner, Geesthacht, 2010]. Right: The present moderator at JEEP II.

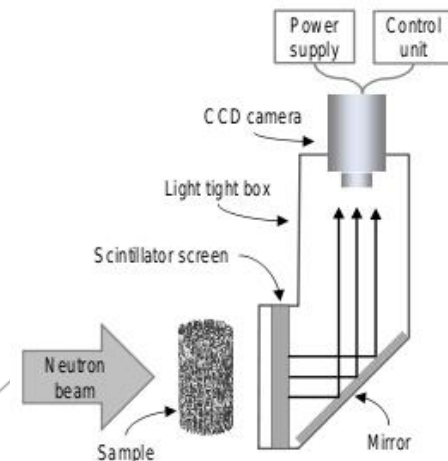
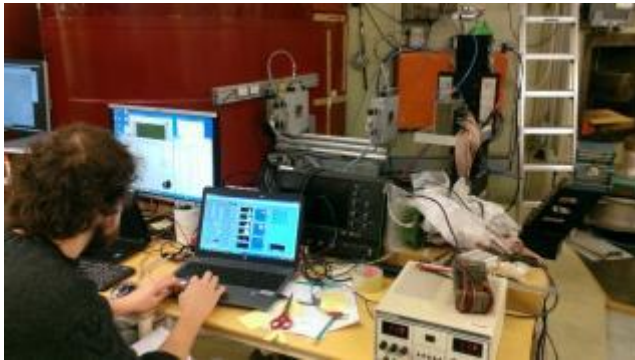
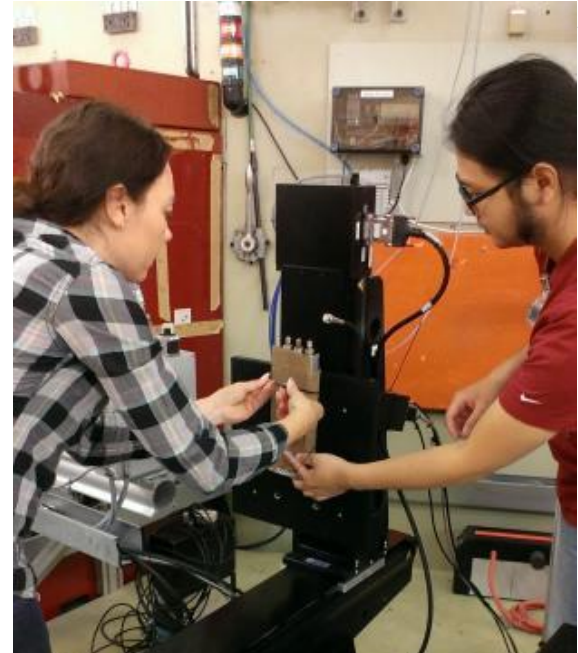


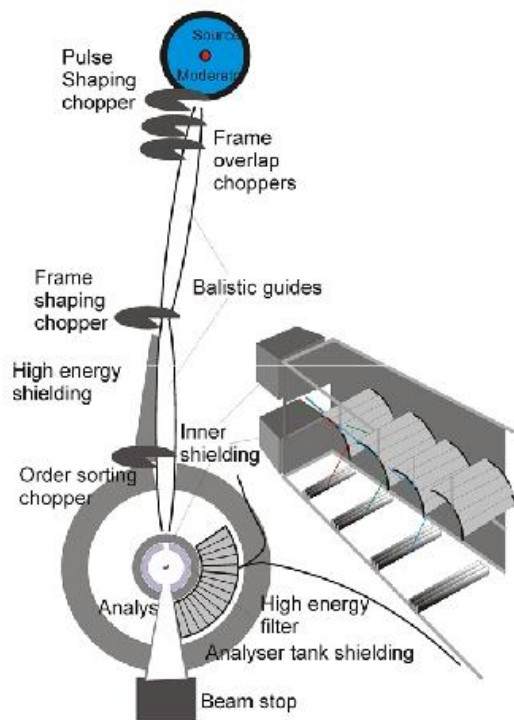
Figure 4.3. Schematic drawing of the neutron imaging system: the collimated neutron beam, scintillator screen, optics and the CCD camera.

# Current ESS project: Test beam line R2D2

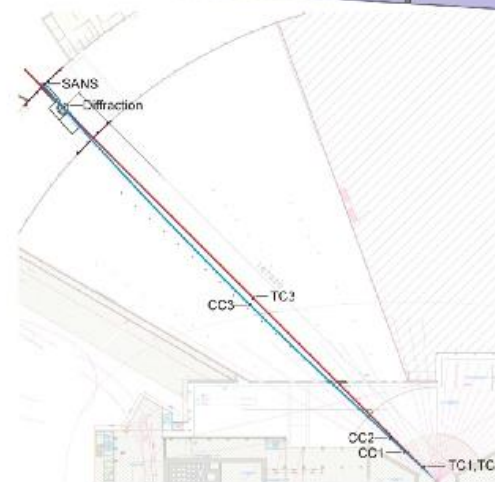
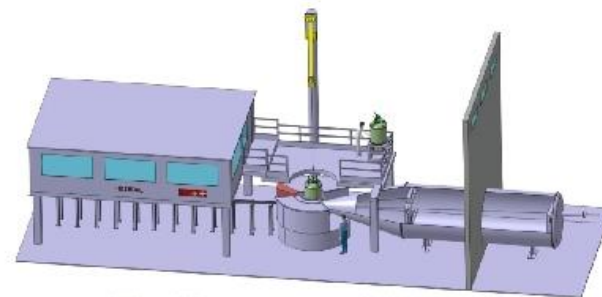




# Future ESS projects: BIFROST and HEIMDAL



BIFROST: shielding



HEIMDAL: shielding + contribution to detector system and choppers