Jülicher Masterpieces - Technology for Excellent Science

ZEA-1 Footprint on the ESS

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JÜLICH Forschungszentrum

At the Central Institute of Engineering, Electronics and Analytics - Engineering and Technology (ZEA-1) we combine engineering at its finest and complex production technologies in cooperation with research partners, including the majority of large neutron science facilities worldwide. By providing interdisciplinary, turn-key solutions — from the idea to the product — we have enabled excellent in science via unique instruments and processes for more than 40 years.

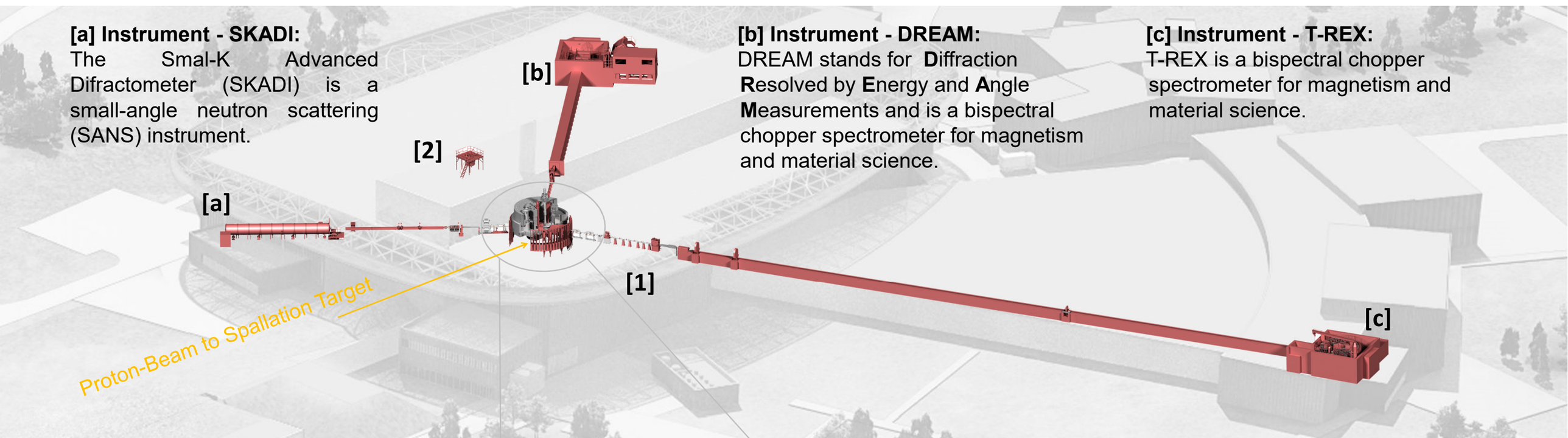
Our core activities at the ESS are the design, manufacture, assembly and commissioning of central infrastructure components of the target, like the moderator and reflector system, the target wheel monitoring plug, the neutron beam extraction system, beam choppers and the hydrogen cryostat. In cooperation with JCNS we are also designing, manufacturing and assembling 3 scattering instruments.

The following figure shows in an isometric view the components provided by ZEA-1 (highlighted in red).

[a] Instrument - SKADI:
The Smal-K Advanced Difractometer (SKADI) is a small-angle neutron scattering (SANS) instrument.

[b] Instrument - DREAM:
DREAM stands for **D**iffraction **R**esolved by **E**nergy and **A**ngle **M**easurements and is a bispectral chopper spectrometer for magnetism and material science.

[c] Instrument - T-REX:
T-REX is a bispectral chopper spectrometer for magnetism and material science.

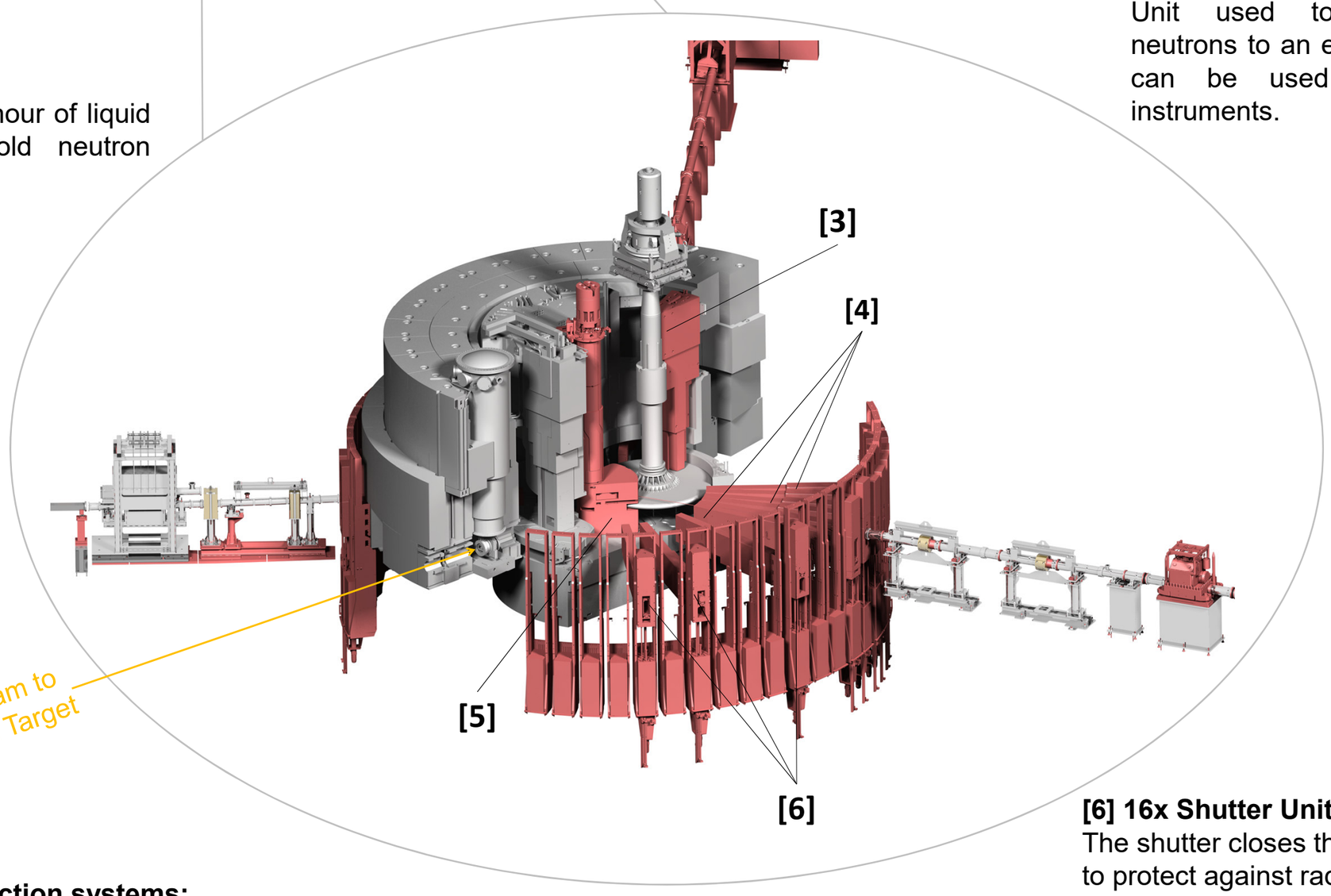


[1] 3x Chopper Systems:
3 Magnetic bearing chopper-systems for the instruments SKADI, T-Rex and Dream.

[2] Hydrogen cryostat:
Unit to provide 3,6 tons per hour of liquid para hydrogen for the cold neutron moderators.

[3] Target Monitoring Plug:
Device to monitor the temperature and the position of the target wheel.

[5] Moderator & Reflector system:
Unit used to slow down neutrons to an energy level that can be used by scientific instruments.



[6] 16x Shutter Units:
The shutter closes the beam path to protect against radiation during an experiment interruption.

[4] 16x Neutron Beam Extraction systems:
System that guides the neutrons from the bunker on the first part of their journey to the experiments.

Typical subtask of ZEA-1 during a project :
- Development, Design and Calculation
- Process and Structure Simulation
- Fabrication and Quality Control
- Trial installation and Testing

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