# ESS Site September 2019



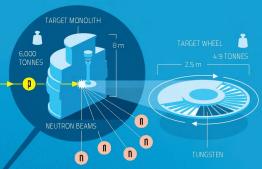
# **European Spallation Source**

The European Spallation Source (ESS) is a multi-disciplinary research centre based on the world's most powerful neutron source. ESS will give scientists new possibilities in a broad range of research, from life science to engineering materials, from heritage conservation to energy and magnetism. ESS is a pan-European project, with Sweden and Denmark serving as host countries. The main research facility is being built in Lund, Sweden, and the Data Management and Software Centre (DMSC) is located in Copenhagen, Denmark.



### THE TARGET IS THE

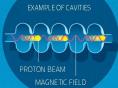
When the accelerated protons hit the rotating tungster target wheel, spallation occurs and neutrons are scattered from the tungsten nucleus. The more neutrons produced and collected in the target, the "brighter" the neutron source. The neutrons are directed through moderators and neutron guides to the scientific instruments where they are used for experiments. The Target monolith consists of the Target wheel, moderators, a cooling system and shielding, and weighs approximately 6,000 tonnes.



# DON S

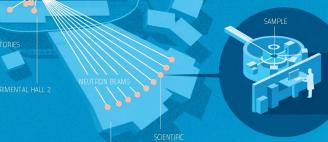
#### PROTONS GENERATED IN AN ION SOURCE

In the ion source protons are generated and guided into the linear accelerator, the Linac. Th first part of the linac is used to focus the proton beam while it arcelerates.



## CAVITIES ACCELERAT

Electromagnetic fields are used to accelerate the protons to approximately 96% of the speed of light. The second part of the accelerator consists of superconducting cavities which are cooled to -271 °C using liquid helium. After traveling 602.5 m than protons high the branch ushall



#### UNIQUE CAPABILITIES OF ES!

ESS will have 22 tailor-made instruments located in three experimental halls. Neutrons are excellent for probing materials on an atomic and molecular level — everything from motors and medicine, to plastics and proteins. The neutrons hit the sample and detectors register the neutron scattering, giving precise information about the material's structure an dynamics.

#### TOTAL BUILDING AREA 65 000 m2

The ESS facility will be approximately 700 metres in total length. The target building will be 125 metres long, and about 30 metres high. The 537-meter-lon accelerator tunnel is built underground and covered with soil.

65,000 m°

602.5m

TARGET MONOLITH

