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Place: Aud B

## **The European Spallation Source: the world's most powerful neutron source**

Abstract:

The European Spallation Source (ESS), situated in Lund, Sweden, is going to become the world's brightest and strongest source of neutrons by 2025. It will be an interdisciplinary research facility enabling ground-breaking research in the fields of life sciences, chemistry, physics, materials, engineering, energy, cultural heritage and fundamental physics.

ESS is one of the largest science and technology infrastructure projects being built today by at least 17 European countries, with Sweden and Denmark being the host nations. The facility design and construction include a linear proton accelerator, a heavy-metal target station, a large array of state-of-the-art neutron instruments, a suite of laboratories, and a computing data management and software center. First neutrons are scheduled for 2019. At the same time the first seven instruments have to be operational. The full baseline suite of 22 instruments will be brought online by 2025.

As in all neutron sources the idea at work here is the illumination of the sample under investigation with a neutron beam and the interpretation of the outcoming neutron scattering patterns, in order to extract information about the structure of matter, in a similar fashion to the use of X-rays.

The broad science motivation for ESS will be presented to the audience and the advantage of neutron scattering over other techniques will be highlighted. An overall description of the facility will provide insight into the realization of such a project. Particular focus will be given on the neutron instruments proposed for ESS, as they present numerous challenges for the detector technology in the absence of Helium-3, which has been the default choice for neutron detectors so far.