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## ESS - HighNESS

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HighNESS (development of High intensity Neutron source at the European Spallation Source) is a three-year EU-funded project aiming at designing a second neutron source at ESS, taking advantage of the upgrade possibilities offered by the facility. The main source, which will serve all the ESS instruments in the initial suite, consists of a high-brightness bi-spectral (thermal-cold) moderator. The second source focuses on delivering high intensity neutron beams of longer wavelengths, in the cold (2-20 Å), very cold (10-120 Å) and ultra-cold (>500 Å) regions. By using liquid deuterium instead of parahydrogen, it is possible to achieve a cold neutron intensity an order of magnitude higher than for the upper moderator. Very cold neutron beams of unprecedented intensity can be produced using advanced moderators and reflector materials, such as solid deuterium, nanodiamonds, and deuterated clathrate hydrates, which are all studied within the project. High intensity neutron beams will offer new possibilities in neutron scattering, in particular for spin echo, imaging, and SANS and world-leading experiments in fundamental physics like the search for neutron-antineutron oscillation. I will present the main features of the ESS second source, and give an overview of the possible applications.

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