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## Materials for nuclear reactor and fusion plants

*Tuesday, 17 March 2026 16:30 (1h 30m)*

In this lecture, we will discuss what types of materials are used in nuclear fission and nuclear fusion reactors, how they are affected by the specific reactor environments, and how we can study their properties, characteristics, and evolution under operation and transient conditions. We will focus on materials close to the reactor cores that experience some of the harshest engineering conditions ever encountered. Intense radiation fluxes, high temperatures and temperature gradients, corrosive environments, and variable stress states affect these materials.

We will discuss nuclear fuels, structural materials, and the specificities and commonalities between fission and fusion reactors and their materials, as well as current research and development efforts in the field. The lecture will provide students with a broad overview of the topic and will also include deep dives into certain specific materials, modelling and experimental subtopics. In particular, the use of diffraction techniques will be highlighted.

**Presenter:** Prof. OLSSON, Pär (KTH)