

## “EXJOB” in Applied Nuclear Physics

### “Simulations of neutron-induced fission reactions for IGISOL”

*Engineering Programme / Master in Physics - Degree Project (Ex-jobb)*

*Applied Nuclear Physics 30 credits (20 weeks)*

The division of applied nuclear physics is involved in fission-yield measurements at the IGISOL facility in Jyväskylä, Finland. High-precision measurements on neutron-induced fission yields are planned to enhance the accuracy of nuclear data, both for the development of fundamental fission models and for nuclear applications. The IGISOL technique has been successfully applied to study proton-induced fission reactions and will now be directed towards fission yields from a reactor-like neutron spectrum. The neutrons will impinge on a fissionable target such as uranium or thorium giving rise to two fission products one of which will be emitted into the reaction chamber. The reaction chamber is filled with He gas, which acts as stopping gas for the emitted fission products. Once the fission products are stopped they are transported via the He gas flow to a mass separator and a Penning trap for identification.

The master project aims to investigate the stopping of fission products in the fission chamber. Differences in the ion-stopping power and counting efficiency are especially crucial to identify, particularly in relation to sources of systematic uncertainties. Various codes are used (MCNP/GEF/GEANT4) and different chamber geometries will be studied. Physical parameters will be varied to investigate their impact on the acquired stopping efficiency. The simulations will later serve as comparison to experimental data obtained at the IGISOL facility.

Interested? Book a meeting with us for more information!

#### **Start date**

Upon agreement

#### **Contacts**

Supervisors: Ali Al-Adili / Andreas Solders / Kaj Jansson

Nuclear Reactions Group

Division of Applied Nuclear Physics

Contact: [Ali.Al-Adili@physics.uu.se](mailto:Ali.Al-Adili@physics.uu.se)