NORWEGIAN NUCLEAR RESEARCH CENTRE

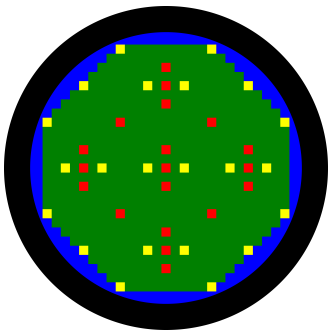
Nuclear propulsion.

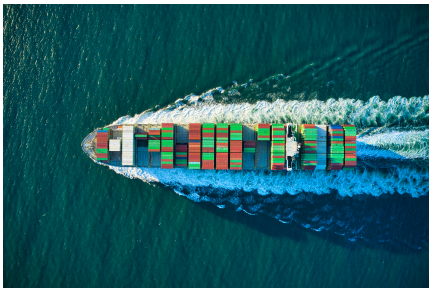
A study into Nuclear powered vessels and the possibility of the nuclearization of the world commercial shipping fleet, both from a technical and laws and regulations perspective.

The use of fossile fuels as an energy source in modern maritime trade is a driving factor in green house gas emissions. One way of drastically reducing CO2 emissions would be to replace fossile fuel with nuclear propulsion systems in modern maritime trade.

An important factor in the use of nuclear reactors for the purpose of propelling modern cargo ships, is intimate knowledge of nuclear reactor systems. This project will attempt a holistic approach to evaluating nuclear propulsion for the modern cargo fleet. This will include reactor simulations of known technologies, shielding evaluation, feasibility evaluation and evaluation of resource availability, and the need for updated laws and regulations.

The main goal is a feasibility report on the potential refitting of traditional cargo ships with nuclear propulsion. This must be evaluated rigorously and source term analysis, criticality analysis and burnout analysis must be attempted. This work will be a continuation of the work done by last years summer students. This year we would like to add a law student to the team to evaluate existing laws and regulations and identify new and/or updated laws and regulations needed for a commercial nuclear shipping industry in Norway.





Left: Model of a reactor core. Right: Cargo ship of size and relevance.

Practical information:

Supervisors:	Sunniva Siem, Ole Reistad, Sunniva Rose
Student background:	Physics and informatics. Understanding and interest in physics and programming is important. (1-3 students)
Student background:	Law student. Understanding and interest in laws and policies related to energy production, preferably also nuclear energy. (1-2 students)
Preferred project period:	Six week duration beginning at any time between April 1st and September 15th, 2025
Expected deliverables:	A report summarizing key results of reactor simulations, and feasibility of refitting the modern cargo fleet. The report include a discussion of new and/or updates of existing laws and regulations needed for a commercial nuclear shipping industry in Norway.