NRG is the sole nuclear service provider in the Netherlands. Our customers include major international companies. Our motive is to ensure a renewable energy supply, a cleaner environment and better health. Our business is to provide specialised, technical services in the areas of risk, safety and optimisation of business operations in the nuclear, oil and gas and petrochemical sectors. We are leaders in the field of Computational Physics for research and innovation for many nuclear applications. Further international development is one of our key ambitions. Our offices are located in Arnhem and Petten. The team is based in Petten.

Within our unit Research and Innovation, we are currently seeking for a

MSc THESIS STUDENT: CFD - THERMAL MIXING

Your responsibilities:
CFD predictions of the turbulent mixing processes that take place in the cooling system of nuclear reactors need improvement. In that respect, CFD predictions of the flow and heat transport in nuclear fuel bundles, pebble bed reactor cores, and in T-junction type configurations have gained a lot of interest. Better prediction of the flow and heat transport in the considered configurations will contribute to an improved design, safety, and operation of nuclear reactors. In relation to this, you will execute a MSc thesis project on:
1) Learning the Nek5000 CFD solver. Nek5000 is an open-source high fidelity CFD solver based on the spectral element method and is actively developed at Argonne National Laboratory in the USA.
2) Further validation of NEK5000 for selected representative basic turbulent flows with heat transfer
3) Application of NEK5000 in order to predict the flow and heat transport in one of the considered nuclear applications, e.g. a fuel assembly or a T-junction.
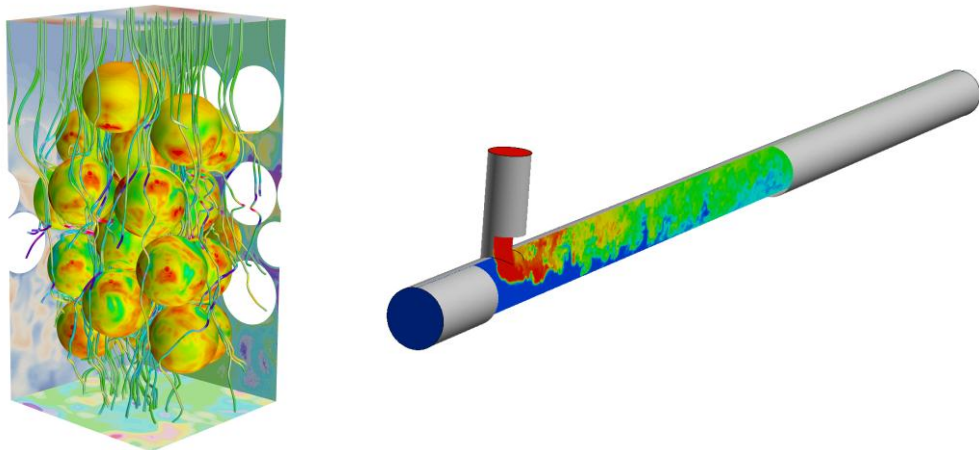
Left: Iso-contours of temperature along with the streamlines in a random pebble bed distribution. Right: Iso-contours of temperature field in a T-junction.

Your profile:
- MSc student in applied science, with specialization in computational fluid mechanics
- Good knowledge of turbulence modelling and numerical methods
- Required computer experience: Linux, Windows, Fortran 77 and / or C
- Fluency in written and spoken English
- Good analytical and problem solving skills
- Dedicated, good communication and social skills

Our offer:
- A challenging thesis project to be executed within a successful team with an informal atmosphere and an excellent reputation
- Strong support from enthusiastic members of the CFD team
- Monthly allowance/stipend
- Housing and transportation compensation for the period of stay

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