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## Aushang

### Institut für Neutronenphysik und Reaktortechnik

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Datum: 08.05.2024



## Einladung zum Seminar über „Nukleare Energieerzeugung“

**Zeit:** Montag, 17. Juni 2024, 11:00 Uhr

**Ort:** Karlsruher Institut für Technologie, Hermann-von-Helmholtz-Platz 1  
76344 Eggenstein-Leopoldshafen, INR, Bau 521, Kolloquiumsraum (R. 302)

**Referent:** Herr **Karl Sturm**, Karlsruher Institut für Technologie, INR

**Titel:** Tackling multi-scale challenges in SMR design and analysis with containmentFOAM and OpenModelica

### Abstract:

The analysis of containment phenomena in SMRs is challenging, and has to take into account effects that present themselves at a large range of scales. A proposed solution to tackle this multi-scale problem is to decompose it into multiple sub-domains, and solve these concurrently in a coupled approach (e.g. coupled CFD and system codes).

In this seminar, we present our approach to implementing a coupling infrastructure for containmentFOAM, an open source CFD code for containment analysis developed at Jülich Research Center, based on OpenFOAM. An extension with the standardized and open co-simulation interface FMI is discussed. Here, for improved simulation convergence and computational efficiency, a semi-implicit calculation scheme with adaptive time stepping is used. Furthermore, a coupling with the system modeling solution OpenModelica is shown, which is used to produce system thermal-hydraulic lumped-element models.

Based on the described open-source simulation infrastructure, a technological demonstrator is presented: the validation of a pressure suppression safety system model as employed in current light water-based SMR concepts.

**Hinweis:** Alle auswärtigen Besucher des Seminars werden gebeten, ihren gültigen Personalausweis oder Reisepass mitzubringen

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