

Internship proposal by KIT

Internship title	NEST-TCOFF-2 QUENCH Fellowship
Proposed duration	between 3 months and 1 year
Host organisation(s)	Karlsruhe Institute of Technology, Institute for Applied Materials IAM-AWP
Supervisor(s)	Dr. Martin Steinbrück
Subject/objective	<p>Experiments on high-temperature oxidation and degradation of ATF cladding materials</p> <p>This experimental work should be devoted to obtaining data for the cladding systems defined in Task 1 and studied in Task 2 of the TCOFF-2 program, as well as to validating the thermodynamic modelling.</p>
Skills required	The candidate should be at least an MSc candidate (or higher education) and have background knowledge in materials science. English language is required.
Description of content	<p>KIT-IAM-AWP offers access to the high-temperature (HT) experimental facilities, metallography and analytical methods for post-test examination. The facilities include HT thermal analysis (DTA, TG), tube furnaces, and the unique QUENCH-SR (single rod) rig working up to 2000°C. All experimental setups are coupled with mass spectrometry for online measurement of the released gases.</p> <p>The specific topic of the internship can be defined according to the TCOFF-2 work programme and the interests of the sending and receiving organisations.</p> <p>The candidate is invited to present his/her results on the annual International QUENCH Workshop.</p>
Other requirements	No further requirements

Internship proposals by KTH

Internship title	NEST-TCOFF-2 SIRT-TM
Proposed duration	6 – 12 months
Host organisation(s)	Kungliga Tekniska högskolan KTH, Division of Nuclear Power Safety
Supervisor(s)	Dr. Andrei Komlev, NPS Lab manager
Subject/objective	Thermodynamic modelling of the corium systems included in SIRT The work is devoted to the thermodynamic modelling of the systems proposed in SIRT Task 1 TCOFF-2 project to improve understanding of the corium system behaviour under severe accident condition.
Skills required	The candidate is expected at least MSc candidate (or higher education) and have background knowledge in physical chemistry, thermodynamic and materials science. English language is required.
Description of content	For the Task-1 of TCOFF-2 project different multicomponent systems were ranking based on the priority for the SA in classical LWR, FDNPP, ATF, etc. KTH-NPS offers to perform thermodynamic simulation of the most important systems using existing TD database NUCLEA. Results will be compared with existing experimental data. Obtained results are expected to be included in the final TCOFF-2 report. The specific systems as well as composition field more relevant for the SA condition will be selected during discussion with internship candidate and/or organization.
Other requirements	No further requirements

Internship title	NEST-TCOFF-2 DMC
Proposed duration	6 – 12 months
Host organisation(s)	Kungliga Tekniska Högskolan KTH, Department of Chemistry (Nuclear Chemistry group)
Supervisor(s)	Professor Mats Jonsson
Subject/objective	Radiation induced dissolution of model corium The work is devoted to experimental studies of radiation induced dissolution of uranium-based model corium with the aim to understand the kinetics and mechanism of the process.
Skills required	The candidate is expected to be at least MSc candidate in chemistry or chemical engineering with a background in physical and/or inorganic chemistry. Experience in experimental work is a merit. English language is required.
Description of content	In this project, model corium will be prepared and characterized using XPS, XRD and SEM. The model corium material will be submerged in water with well-controlled composition and exposed to gamma-radiation. The solution concentration of the model corium constituents will be analyzed as a function of time using ICP-OES and UV-vis spectroscopy.
Other requirements	No further requirements

Internship proposal by CEA

Internship title	NEST-TCOFF-2 CEA Fellowship
Proposed duration	between 3 months and 1 year
Host organisation(s)	CEA, Cadarache Research Center, Nuclear systems research institute for low carbon energy production, Department of nuclear technology, Measurements and modelling of transfers and severe accidents section Severe accident experimental laboratory
Supervisor(s)	Jules Delacroix, Pascal Piluso, Andrea Bachrata
Subject/objective	Experimental support to thermodynamic calculations for severe accident studies and/or accident tolerant fuel
Skills required	MSc, skills in materials science, instrumentation
Description of content	Opportunity to attend high temperature characterization tests on the VITI facility of the PLINIUS platform in Cadarache, for selected materials. Thermodynamic calculations, Calphad approach. Knowledge in infrared thermometry, inductive heating. PhD thesis opportunity at the end of the internship.
Other requirements	Applications subjected to administrative inquiry.