

# Swedish Centre for Nuclear Technology

## Annual Symposium 2023

at AlbaNova University Center

### October 16th

- 09:30-10:00 **Assembly**
- 10:00-10:15 Introduction  
**Cilla Andersson**, SKC
- 10:15-10:40 *Future electricity production in Sweden*  
**Martin Vallstrand**, Vattenfall
- 10:40-11:30 Research project presentations  
**Kristoffer Tofveson Pedersen**, CTH  
**Shuyue Wang**, KTH
- 11:30-12:00 **Coffee break**
- 12:00-12:50 Research project presentations  
**Mustafa Subasic**, KTH  
**Ibrahim Batayneh**, KTH
- 12:50-13:50 **Lunch**
- 13:50-15:45 Research project presentations  
**Gustav Robertsson**, UU  
**Yi Meng Chan**, KTH  
**Luca Gagliani**, KTH  
**Michal Sedlak Mosesson**, KTH
- 15:45-16:15 **Coffee break**
- 16:15-16:40 Research project presentation  
**David Mayweg**, CTH
- 16:40-16:50 KTH Master's program  
**Jan Dufek**, KTH
- 16:50-17:20 *Politics and plans for energy and nuclear power I*  
**Maja Lundbäck**, Regeringskansliet
- 18:00 **Dinner**

### October 17th

- 08:30-09:00 **Assembly**
- 09:00-09:15 *Politics and plans for energy and nuclear power II*  
**Daniel Westlén**, Regeringskansliet
- 09:15-10:15 Ongoing nuclear research  
- CTH  
- UU  
- KTH
- 10:15-10:30 **Quick break**
- 10:30-11:30 Sigvard Eklunds prize  
- Announcement of the winners  
- Presentation of theses
- 11:30-11:50 **Coffee break**
- 11:50-12:20 YG, SAINT, SKS, ANItA
- 12:20-12:50 Panel discussion: *Important activities to secure competence for future Nuclear power in Sweden*  
**Johan Börjesson**, FKA/SKC  
**Per Seltborg**, SSM/SKC  
**Lovisa Lundholm**, SU/SAINT  
**Balder Hagert**, AFRY/SKS  
**Ane Håkansson**, UU/ANItA
- 12:50-13:00 Summary and closure of the Symposium  
**Cilla Andersson**, SKC
- 13:00-14:00 **Lunch**

# Summary of Research projects supported by SKC 2023

During the current program period 2020-2023 SKC fully support 7 PhD students and 2 post-doc. Their progress is described in the SKC annual report and presented at the SKC symposium.

## **Kristoffer Tofveson Pedersen** - *Study of core stability during load follow with ROM methods*

The project started 2020 and is carried out at the Department of Physics at CTH. Main supervisor is Christophe Demazière. The main objective of the work is to be able to understand the parameters involved when studying the stability of a nuclear reactor concerning load-follow conditions and to be able to assess whether a core loading is stable or unstable directly from the Reduced-Order Model (ROM), without turning to lengthy and complex high-fidelity simulations.

## **Shuyue Wang** - *Influence of ageing and radiation on ductile fracture in the DBT temperature region*

The project started 2020 and is carried out at the Department of Engineering Mechanics at KTH. Main supervisor is Jonas Faleskog. The main objective of the work is to understand the influence of time-dependent ageing and degradation mechanisms on the ductile behavior of low alloy steels.

## **Mustafa Subasic** - *Corrosion fatigue in LWR environment at cyclic thermal and mechanical loads*

The project started 2020 and is carried out at the Department of Engineering Mechanics at KTH. Main supervisor is Pål Efsing. The main objective of the work is to contribute to improved assessment tools and methods against corrosion fatigue at mixing points and systems with stagnant and/or turbulent flow.

## **Ibrahim Batayneh** - *SEMRA: Steam Explosion Modelling and Risk Analysis for light water reactors*

The project started 2021 and is carried out at the Department of Physics at KTH. Main supervisor is Dmitry Grishchenko. The main objective of the work is to develop a new code for ex-vessel steam explosions in LWRs.

## **Gustav Robertsson** - *Calibration of fuel performance codes - treating model inadequacies, nuisance parameters, and unrecognized systematic uncertainties*

The project started 2020 and is carried out at the Department

of Physics and Astronomy at UU. Main supervisor is Henrik Sjöstrand. The main objective of the work is to improve techniques for calibration and uncertainty quantification in the context of fuel rod performance simulations.

## **Yi Meng Chan** - *Application of artificial neural networks in reactor physics calculations*

The project started 2021 and is carried out at the Department of Physics at KTH. Main supervisor is Jan Dufek. The main objective of the work is to develop more accurate nodal data representation compared to the models in the current literature. This would allow for more flexible and accurate reactor simulations than possible with existing data models.

## **Luca Gagliani** - *Impact of radiation chemistry on surface processes in LWRs*

The project started 2022 and is carried out at the Department of Chemistry and Chemical Engineering at CTH and the Department of Chemistry at KTH with Mats Jonsson as main supervisor. The main objective is to study the mechanisms behind corrosion, oxide deposition and oxide release with emphasis on the role of water radiolysis.

## **Michal Sedlak Mosesson** - *Development of a fully coupled electrochemical and micro mechanical SCC model*

The project started 2020 and is carried out at the Department of Engineering Mechanics at KTH. Main supervisor is Pål Efsing. The main objective of the work is to develop a better understanding of Stress Corrosion Cracking (SCC).

## **David Mayweg** - *Influence of Alloying and Neutron Flux on Irradiation Effects in Fuel Rods*

The project was carried out from 2021 to 2023 in the Dept of Physics at CTH supervised by Mattias Thuvander. Zirconium-based cladding tubes from operation in a boiling water reactor were investigated. Successful characterization of neutron irradiation effects in the metal and the oxide on the nm-scale was achieved. In addition, influences of preparation methods on hydrogen analysis could be ascertained.