

NOMATEN Hybrid Seminar

Location: NOMATEN seminar room (102)

gotomeeting room (for online): <https://meet.goto.com/NCBJmeetings/nomaten-seminar>

Seminar date: April 9th, 2025

Time: 1 PM (CET)

Speaker name: Dr. Saurabh Mohan Das

Speaker affiliation: DIFFER (Dutch Institute of Fundamental Energy Research), Eindhoven, Netherlands

Title: Understanding synergistic effects of radiation and corrosion in structural materials

Abstract: Small modular reactors (SMRs), with capacities ranging from 30 to 300 MWe per unit, offer a scalable and compact alternative to traditional large-scale nuclear plants. They provide a promising solution to meet the growing energy demands driven by technology sectors like AI and data centers. These advanced reactors utilize molten salt as both fuel and coolant, exposing structural materials to the combined effects of high-temperature corrosion and intense irradiation from neutron fluxes. Understanding both corrosion- and irradiation-induced material degradation mechanisms is crucial for selecting suitable component materials.

At DIFFER, we have developed a cutting-edge facility called DICE (DIFFER's Irradiation Corrosion Experiment), a unique platform that enables simultaneous proton irradiation and salt corrosion experiments. In addition, we have built a dedicated setup for a sequential approach - first irradiation, then corrosion - to evaluate the effects of individual environments on material performance.

In this talk, I will present the challenges associated with conducting such complex experiments and discuss the innovative techniques and methodologies we have developed to overcome these challenges, enabling a deeper understanding of material degradation mechanisms in harsh reactor environments.

Bio: I, Saurabh Mohandas, am a postdoctoral researcher at DIFFER (Dutch Institute of Fundamental Energy Research), Eindhoven, Netherlands, where I explore the irradiation and corrosion effects on structural materials. I did my PhD from Indian Institute of Science, Bangalore, India, where I studied corrosion behavior of superalloys.