

NUFUEL 2023

Research into Nuclear Fuel in Europe

Programme

Welcome will start on Tuesday, November 7th at 8:15 a.m. in the workshop room at the Radisson Blu Marseille Vieux Port Hotel.

	Tuesday, November 7th		Chairs
09:00-09:20	Workshop Chairmen, CEA IRESNE and DEC directors	Workshop opening	
09:20-09:40	Davide Pizzocri, Politecnico di Milano	A digital twin for a separate effect experiment about inert gas behaviour	Marjorie Bertolus (CEA IRESNE), Octavian Uta (RATEN)
09:40-10:00	Matthieu Reymond, EPFL	Implementation of multi-dimensional transport solvers in OFFBEAT	
10:00-10:20	Matteo Vergani, CEA IRESNE	Latest developments in the MARGARET fission gas and microstructure model, based on recent experimental findings and atomic scale modelling.	
10:20-11:00	PAUSE		
11:00-11:20	Susannah Lea, Imperial College London	Understanding the Oxidation Mechanisms of Zircaloy using Peridynamic Modelling	Morgane Rochedy (CEA IRESNE), Davide Pizzocri (Polimi)
11:20-11:40	Joris Lippens, NRG	Irradiation test design for actinide-bearing chloride salts in the HFR	
11:40-12:00	Nick ter Veer, TU Delft	Experimental insight and modelling of the NaCl-ThCl ₄ -PuCl ₃ fuel salt properties	
12:00-12:20	Andrea Quaini, CEA ISAS	Experimental investigation on the stability of corium metallic phases	
12:20-13:40	LUNCH		

13:40-14:00	Thomas Haynes, University of East Anglia	Peridynamic Modelling Of Cracking In TRISO Coated Particle Fuel For High Temperature Reactor (HTRs) – The Importance Of Residual Stresses To The Crack Patterns Formed	
14:00-14:20	Fengrui Xiang, EPFL	Preliminary Extension of OFFBEAT to TRISO Fuel	
14:20-14:40	Salomon El Bez, CEA IRESNE	Micromechanical behavior of UO ₂ : modelling of dislocation climbing in the recovery creep stage	Alessandro Scolaro (EPFL), Cloé Schneider, (PSI) (tbc)
14:40-15:00	Par Olsson, KTH	Inter- and transgranular fracture properties of UO ₂ with and without the presence of fission products are studied using electronic structure theory	
15:00-15:20	Zola Hinds, Bangor University	Smooth Particle Hydrodynamics for Fuel Performance Modelling	
15:20-16:00	PAUSE		
16:00-16:20	Marco Cologna, JRC Karlsruhe	Synthesis of Uranium nitride from citrate sol-gel method	
16:20-16:40	Ritesh Mohun, Bangor University	Investigating the mechanisms of grain growth additives incorporation in UO ₂ fuels	
16:40-17:00	Thomas Dumaire, TU Delft	Chromium speciation in Molten Salt Reactor fuels	Pär Olsson (KTH), Philippe Martin (CEA ISEC)
17:00-17:20	Morgane Rochedy, CEA IRESNE	Study of the Pu-Np-O system: an approach coupling experimental and CALPHAD modelling	
17:20-17:40	Lukasz Ruszczynski, TU Delft	Coupled modelling of structural, thermodynamic and physicochemical properties of NaF-KF-UF ₄ fuel salt	
17:40-19:30	POSTER SESSION		

	Wednesday, November 8th		
09:00-09:20	Megan Pritchard, The University of Manchester	Oxidation studies of UN/UB ₂	Tommaso Barani (CEA IRESNE), Marco Cologna (JRC)
09:20-09:40	Laure Ramond, CEA ISEC	Fabrication of MOX disks with controlled porosity	
09:40-10:00	Jérôme Sercombe, CEA IRESNE	Thermodynamic-based modeling of fuel melting in the fuel performance code ALCYONE	
10:00-10:20	Alejandra De Lara, University of Cambridge	Calculating the safety margins of the AGR-like FHR	
10:20-11:00	PAUSE		
11:00-11:20	Angelo Battistini, Imperial College London	Peridynamics Modelling of TRISO Coated Particle Fuel, a Comparison between 2D and 3D Models	Davide Pizzocri (Polimi), Cloé Schneider, (PSI) (tbc)
11:20-11:40	Marc Josien, CEA IRESNE	PLEIADES/Méropé : A microstructure generator for simulation of nuclear materials.	
11:40-12:00	Jonathan Amodeo, CNRS AMU	Plastic deformation of uranium dioxide at high temperature: modeling of the single crystal plastic anisotropy	
12:00-12:20	Elina Charatsidou, KTH	Thermal conductivity of UN as a function of solid fission product concentration: Separate-effect testing coupled with first principles models.	
12:20-13:40	LUNCH		

13:40-14:00	Arianna Pagani, Politecnico di Milano	A model for athermal fission gas release in SCIANTIX	
14:00-14:20	Jules-Elémir Suchorski, CEA IRESNE	Dislocation core and mobility of the screw dislocation in uranium dioxide	Pär Olsson (KTH), Philippe Martin (CEA ISEC)
14:20-14:40	Cloé Schneider, PSI	Characterisation by μ XRD/XRF of the interlayer between the fuel and its cladding in a high burnup fuel rod	
14:40-15:00	Faris Sweidan, KTH	Steady-State Secondary Creep Rate of Uranium Mononitride using Spark Plasma Sintering	
15:00-15:20	Catherine Sabathier, CEA IRESNE	Fission gas bubble population in a High burn-up irradiated UO_2 fuel until their internal pressure determination using STEM-EELS	
15:20-16:00	PAUSE		
16:00-16:20	Lucas Salmon, CEA IRESNE	SFR fuel cracks modeling using phase field approach	Marjorie Bertolus (CEA IRESNE), Tommaso Barani (CEA IRESNE)
16:20-16:40	Martina Di Gennaro, Politecnico di Milano	Reduced order modelling of fission gas diffusion in fuel performance codes	
16:40-17:00	Philippe Garcia, CEA IRESNE	Solid-state electrochemical methods for characterising thermodynamic and diffusion properties of non-stoichiometric fuels	
17:00-17:20	Mathieu Gascoin, CEA IRESNE	First principles study of volatile fission products trapping properties and chromium doping in actinide oxides	
17:20-17:40	Robert Harrison, The University of Manchester	Understanding thermal property behaviour as a function of radiation damage defects in advanced nuclear fuels	

	Thursday, November 9th		
09:00-09:20	Max Salata-Barnett, The University of Manchester	Interdiffusion behaviour of UN with Zircaloy-4 via diffusion couple studies	Octavian Uta (RATEN), Morgane Rochedy (CEA IRESNE)
09:20-09:40	Jean-Christophe Dumas, CEA IRESNE	Fission chemistry and high temperature behaviour of irradiated MOX fuels with $Pu/(U+Pu)=0.45$ by thermodynamic calculations	
09:40-10:00	Joshua Langcaster, Imperial College London	Modeling stress concentrations induced by zirconium hydrides in fuel cladding by neural networks	
10:00-10:20	Jean-Mathieu Vanson, CEA IRESNE	Thermo-mechanical and fluid simulation of granular media: developments and applications to nuclear fuels	
10:20-11:00	PAUSE		
11:00-11:20	Matthew Horton, NNL	Mesh Free Methods: Uses and application to Nuclear Fuel	Marco Cologna (JRC), Alessandro Scolaro (EPFL)
11:20-11:40	Inez Solomon, The University of Manchester	Analysis of Future Fuel/Cladding Systems for Light Water Reactor Use	
11:40-12:00	Giovanni Nicodemo, Politecnico di Milano	Chromia doped UO_2 fuel: Modelling of chromium solubility and fission gas diffusivity in SCIANTIX	
12:00-12:20	Jonathan Morgan, The University of Manchester	Flash sintering of $(U,Ce)O_2$ pellets as a surrogate for MOX fuel	
12:20-12:40	Workshop wrap-up and closing address		
12:40-14:00	Lunch		

