

**Fifth International Workshop on Structural Material
for Innovative Nuclear Systems (SMINS-5)**

8-11 July 2019

Programme

Monday 8 July

Opening session

08:00	09:10	Registration
09:10	09:20	Welcome address from Kyoto University and JAEA
09:20	09:30	Welcome address from NEA/ Chair of the SAC

SESSION 1: Overview of programmes

Chair: Akihiko Kimura

09:30	09:50	Overview of Japanese programmes on materials for innovative nuclear systems Tai Asayama (JAEA, Japan)
09:50	10:10	The Joint Programme on Nuclear Materials (JPNM) of the European Energy Research Alliance and the M4F Project Lorenzo Malerba (EERA, JPNM)

SESSION 2: Fundamental studies

Chair: Céline Cabet

10:10	10:30	On the role of Ni, Si and P on the nanostructural evolution of FeCr alloys under irradiation – link with hardening. Cristelle Pareige (Uni. Rouen, France)
-------	-------	--

10:30 11:00 **Coffee**

11:00	11:20	Radiation-induced formation of minor solute clusters in ferritic/martensitic Fe-Cr alloys Lorenzo Malerba (CIEMAT, Spain)
11:20	11:40	Primary damage in structural materials at the quantum scale Pär Olsson (KTH, Sweden)
11:40	12:00	Experimental and theoretical investigations of effects of fast particle irradiations Alexander Ryazanov (Kurchatov Institute, Russia)
12:00	12:20	Influence of irradiation on the hydrogen isotope permeation behaviour in the oxidised Fe-Cr-Al ferritic steel Yuping Xu (CAS, China)
12:20	12:40	Discussion

12:40 14:10 **Lunch**

Poster session

Chairs: Lorenzo Malerba and Jian Gan

14:10 16:00 Poster presentations (30*3 mins) (allowing for change over)

16:00 16:30 **Coffee**

SESSION 3: ODS

Chair: Yugang Wang

16:30 16:50 **Keys for radiation tolerance of ODS steels for advanced nuclear systems**
Akihiko Kimura (Kyoto Uni., Japan)

16:50 17:10 **Pressure Resistance Weld Development for ODS Cladding**
Jian Gan (INL, US)

17:10 17:30 **Mechanical properties, welding performance and high temperature steam oxidation resistance of the fuel cladding fabricated using cast CNS-I-ODS**
Qingzhi Yan (Uni. Beijing, China)

17:30 17:50 **Discussion**

Tuesday 9 July

SESSION 1: Overview of programmes

Chair: Manuel Pouchon

08:30 08:50 **Overview of US-DOE Research on Advanced Reactor Clad Material Development**
Stuart Maloy (LANL, US)

08:50 09:10 **Overview of the MYRRHA project**
Erich Stergar (SCK-CEN, Belgium)

SESSION 4: ATF

Chair: Manuel Pouchon

09:10 09:30 **Current Status and Future Prospect of Light Water Reactor Accident-Tolerant Fuels R&D in Japan**
S. Yamashita (JAEA, Japan)

09:30 09:50 **Advanced surface treatments for nuclear applications**
Fanny Balbaud (CEA, France)

09:50 10:20 **Coffee**

10:20 10:40 **Performance of alumina-forming duplex stainless steels as accident tolerant fuel cladding materials**
Changheui Jang (KAIST, KOREA)

10:40 11:00 **Effect of Neutron Irradiation under Halden Reactor Water Environment on Shield SiC/SiC Cladding Property**
Akira Kohyama (NITE Corporation, Japan)

11:00 11:20 **Microstructure Analysis and Hardness Test of Irradiated Multi-Metallic Layer Composite Material for Accident Tolerant Fuel Cladding**
Taeyong Kim (Ulsan National Institute, Korea)

11:20 11:40 **Discussion**

11:40 13:10 **Lunch**

SESSION 5: Advanced processes and materials

Chair: Fanny Balbaud

13:10	13:30	Advanced mitigation strategies for HLM Corrosion – GESA, AFA, HEA Alfons Weisenburger (KIT, Germany)
13:30	13:50	Austenitic to ferritic steel functionally graded components for nuclear applications Emmanouil Stavroulakis (Uni. Manchester, UK)
13:50	14:10	Additive Manufacturing Processes for Nuclear Power Applications Pascal Aubry (CEA, France)
14:10	14:30	Irradiation Tolerance of Refractory BCC High-Entropy Alloys at High Temperature Bo-Shiuan Li (Uni. of Oxford, UK)
14:30	14:50	Discussion

14:50 15:10 **Coffee**

Poster session

Chairs :Marta Serrano & Thierry Auger

15:10 16:25 Poster presentations (20*3 mins) (allowing for change over)

16:25 16:45 **Break**

16:45 18:00 Poster presentations (20*3 mins) (allowing for change over)

18:00 20:00 **Poster session and drinks**

Wednesday 10 July

SESSION 1: Overview of programmes

Chair: Satoshi Ohtsuka

08:30	08:50	Nuclear Materials Research in Switzerland Manuel Pouchon (PSI, Switzerland)
08:50	09:10	The Status and Challenges in Development of Fusion Reactor Materials in China Yugang Wang (Peking Uni., China)
09:10	09:30	Materials Research for Fission Nuclear Power Reactors in China En-Hou Han (China)

SESSION 6: Metal alloys for advanced systems

Chair: Stuart Maloy

09:30	09:50	Improved creep properties of G91 steel by thermo-mechanical treatments Marta Serrano (CIEMAT, Spain)
09:50	10:10	The behaviours of solute elements and spallation transmutants at grain boundaries and precipitate-matrix interfaces in F82H steel after irradiation with high-energy protons and spallation neutrons Yong Dai (PSI, Suisse)

10:10 10:40 **Coffee**

10:40	11:00	Embrittlement of neutron-irradiated austenitic steel at high dose: ductile fracture modelling based on SEM and TEM microstructural characterization Arnaud Courcelle (CEA, France)
11:00	11:20	Study of effects of low concentration Helium on tensile properties of Tungsten by Helium Akira. Hasegawa (Tohoku Uni., Japan)
11:20	11:40	Intermediate temperature embrittlement in nickel alloys for molten salt reactors Thierry Auger (CNRS, France)
11:40	12:00	Discussion
12:00	13:20	Lunch

Panel discussion
“ How to fast track innovative materials through to application”
Chair: James Marrow

13:20	13:50	Integrated computational materials engineering (ICME) vs. integrated computational alloy design Franck Tancret (Uni. Nantes, France)
13:50	14:20	Advanced manufacturing technologies for low- carbon energy. Frédéric Schuster (CEA, France)
14:20	14:50	Ions versus neutrons irradiations Steve Zinkle (ORNL, US)
14:50	15:20	Irradiation induced defect production and microstructural evolution in tunable concentrated solid-solution alloys William Weber (Uni. Tennessee, US)
15:20	15:45	Coffee
15:45	17:00	Panel discussion
19:00	22:00	Dinner at Sodoh restaurant

Thursday 11 July

SESSION 1: Overview of programmes
(Chair: Erich Stergar)

08:30	08:50	The European GEMMA project – overview and first neutron diffraction measurements of stress field in welds Pietro Agostini (ENEA, Italy)
08:50	09:10	Status of the IAEA Coordinated Research Projects (CRPs) on Fuel Modelling and Ion Accelerator Simulation of Radiation Effects (SMoRE-2) and on Analysis of Options and Experimental Examination of Fuels with Increased Accident Tolerance (ACTOF) Mikhail Veshchunov (IAEA)

09:10 09:30 **The Generation IV International Forum Advanced Manufacturing and Materials Engineering Task Force**
Lyndon Edwards (GIF)

SESSION 6: Metal alloys for advanced systems
Chair: Yong Dai

09:30 09:50 **Prediction of Creep and Creep-Fatigue Damage of Alloy 617 for Application in VHTR Systems**
Ondrej Muransky (ANSTO, Australia)

09:50 10:20 **Coffee**

10:20 10:40 **Irradiation effects of ADS component materials on compatibility with liquid lead bismuth alloy**
Nariaki Okubo (JAEA, Japan)

10:40 11:00 **Testing of 15-15Ti stainless steel cladding for the ALLEGRO gas-cooled fast reactor**
Márton Kiraly (MTA EK, Hungary)

11:00 11:20 **Discussion**

11:20 11:50 Meeting Summary from the session chairs

11:50 12:00 Closing speech