



ICAPP 2019

12 - 15 MAY • ANTIBES - JUAN-LES-PINS

ENSURING A KEY ROLE FOR NUCLEAR

PROGRAM



OVERVIEW

SUNDAY, MAY 12	MONDAY, MAY 13	TUESDAY, MAY 14	WEDNESDAY, MAY 15
03:30 Registration	07:30 Registration	07:30 Registration	07:30 Registration
04:30 Welcome Session	08:00 Opening Session	08:00 Plenary 2 Future Nuclear Energy Systems	08:00 Plenary 3 Nuclear Fuel & Sustainability
06:30 Welcome Reception	08:20 Panel 1 Nuclear Energy International Outlook	10:00 Break	09:45 Break
08:00 End of the day	10:00 Break	10:30 Technical Sessions 2 T03, T06, T07, T08, T09, T11	10:15 Technical Sessions 5 T01, T03, T06, T07, T08, T09, T10
	10:30 Panel 2 & Statement NICE Future	12:30 Lunch Period & Mentoring Session	12:15 Lunch Period & Posters Spots Ending
	12:15 Student Program Pitch	01:45 Technical Sessions 3 T02, T03, T04, T06, T07, T08, T10	01:30 Technical Sessions 6 T03, T06, T07, T08, T09, T10
	01:00 Lunch Period & Posters Spots Opening	03:45 Break	03:30 Break
	02:30 Technical Sessions 1 T01, T03, T05, T07, T08, T10	04:45 Technical Sessions 4 T01, T03, T04, T06, T08	04:00 Keynote 2 Nuclear Solutions for Space
	04:30 Break	06:45 Keynote 1 Nuclear & Renewable in a Decarbonate Energy System	05:00 Closing Session
	05:00 Plenary 1 Nuclear New Build & Operation	07:45 Transition	05:30 Closing Drinks
	07:30 End of the day	08:00 Transfer Bus	
		08:30 Congress Reception Awards Ceremony • ENS High Scientific Council 2018 PhD Award • ICAPP 2019 Best Student Pitch Audience Award	
		11:00 End of the day	

Poster presentations will be displayed from Monday 01:00 PM to Wednesday 01:00 PM.
Discussions between authors and participants will be encouraged during breaks.

CHAIRS & TOPIC LEADERS

Technical Program Chair	• Frank Carré • CEA
Honorary Chairs	• Noël Camarcat • EDF • Mitsuru Uesaka • University of Tokyo
General Chair	• Jean-Pol Serpenté • Framatome

T01	Water-Cooled Reactor Programs & Related Small Modular Reactor Developments • Jean-Luc JACOUD, Framatome & Jacques CHENAIS, CEA
T02	High Temperature Reactors • Dominique HITTNER, Consultant & Michael FUETTERER, JRC-Petten
T03	Fast Neutron Reactors • Alfredo VASILE, CEA & Bernard CARLUEC, Framatome
T04	Molten Salt Reactors & Other Advanced Reactors • Sylvie DELPECH, CNRS & Joël GUIDEZ, CEA
T05	Operation, Performance & Reliability Management • Patrick MORILHAT, EDF & Christophe VARÉ, EDF
T06	Plant Safety Assessment, Regulatory & Licensing Issues • Giovanni BRUNA, ex-IRSN - Paride MELONI, ENEA - Alessandro PETRUZZI, NINE - Michel GIOT, UCLouvain - Michael CORRADINI, Univ. Wisconsin
T07	Reactor Physics & Analysis • Anne NICOLAS, CEA & Frédéric DAMIAN, CEA
T08	Thermal Hydraulics Analysis & Testing • Antoine GERSCHENFELD, CEA - Anthony DYAN, EDF - Danielle GALLO, CEA
T09	Fuel Cycle & Waste Management • Cécile EVANS, ORANO - Luc VAN DEN DURPEL, Nuclear-21.Net - Andrea SALVATOIRES, CEA
T10	Materials & Structural Issues • Céline CABET, CEA
T11	Nuclear & Integrated Energy Systems • Enrico GIRARDI, EDF & Michel BERTHELEMY, CEA

MAY, SUNDAY 12

	03:30	Registration _____  Congress Center - Level 2
	04:30	Welcome Session _____  Antipolis Amphitheater Chairs : ▸ F. Carré • CEA ▸ V. Faudon • SFEN Speakers : ▸ D. Iracane • OECD - NEA ▸ M. Maschi • EDF
	06:30	ICAPP 2019 • Welcome Reception _____  Rooftop of the Congress Center
	08:00	End of the day

MAY, MONDAY 13

	07:30	Registration _____  Congress Center - Level 2
	08:00	Opening Session _____  Antipolis Amphitheater Speaker : _____ ▸ P. Knoche • SFEN
	08:20	Panel 1 • Nuclear Energy International Outlook _____  Antipolis Amphitheater Moderator : _____ ▸ Y. Desbazeille • FORATOM Speakers : _____ ▸ A. Zbib • PNNL _____ ▸ S. Wang • CNS _____ ▸ H. Rhein • European Commission _____ ▸ T. Yeo • New Nuclear Watch Institute _____ ▸ K. Sadamori • OECD - IEA _____ ▸ P. Knoche • Orano
	10:00	Break _____  Antipolis Amphitheater Lobby
	10:30	Panel 2 & Statement • NICE Future _____  Antipolis Amphitheater Chair : _____ ▸ V. Faudon • SFEN Speakers : _____ ▸ Y. Komano • AESJ _____ ▸ D. Hoffman • ANS _____ ▸ K. Sadamori • OECD - IEA _____ ▸ S. Napier • NNL NIRO _____ ▸ N. Peterson • FORATOM Signature of Statement _____
	12:15	Student Program Pitch • Sponsored by CEA _____  Antipolis Amphitheater 5 PhD students will present their research in a clear, concise and compelling way with the support of a single slide ! Moderator : _____ ▸ M. Boissavit • SFEN Young Generation Students : _____ ▸ 176 • P. Champlin • Massachusetts Institute of Technology _____ ▸ 182 • K. Ahmed • University of Wisconsin-Madison _____ ▸ 199 • M. Kazemeini • University of Nevada-Las Vegas _____ ▸ 159 • M. Faucher • Université Paris-Saclay _____ ▸ 040 • F. Villaret • Université Paris-Saclay Audience Vote _____
	12:45	Lunch Period _____  Gould Area & Posters Spots Opening
	02:30	Technical Sessions 1 in parallel

 Fitzgerald Room	T08	2-Phase system code & IET	Chair : F. Morin • CEA
	02:30 - 02:50	134 • Experimental Study on the Steam Line Break(SLB) Accident Accompanied by a Total Failure of Safety Injection Pump(SIP) • Y. Park • KAERI	
	02:50 - 03:10	138 • 3DSYSTH : an OECD/NEA activity on multi-dimensional capabilities of thermalhydraulic system codes • C. Herer • IRSN	
	03:10 - 03:30	253 • A mechanistic flashing model for critical flowrate prediction using CATHARE 3 system code • M. Vernassiere • CEA	
	03:30 - 03:50	290 • RELAP5 simulation of Core Makeup System against OECD-ATLAS Experimental data • H. J. Yoon • KUST	

	03:50 - 04:10	291 • RELAP5 simulation of Intermediate Break Loss of Coolant Accident against ATLAS Facility • H. J. Yoon • KUST
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 Davis Room	T03	Safety	Chairs : J. Buongiorno • MIT & P. Gauthé • CEA
	02:30 - 02:50	060 • Fuel discharge toward the core catcher under severe accident conditions with mitigation devices in a Sodium-cooled Fast Reactor • A. Bachrata • CEA Cadarache	
	02:50 - 03:10	200 • Study on the discharge behavior of molten-core through the control rod guide tube in the core disruptive accident of SFR • S. Kato • JAEA	
	03:10 - 03:30	204 • Innovative and inherently safe small SFR as a response to the dilemma 'safety vs cost' • P. Gauthé • CEA Cadarache	
	03:30 - 03:50	205 • Source Term Assessment in a Prototype Sodium Fast Reactor BDBA Scenario • M. Garcia • CIEMAT	
	03:50 - 04:10	213 • A roadmap for European experimental research for Generation IV reactor severe accident research • C. Journeau • CEA	
	04:10 - 04:30	368 • SAS4A-FATE Source Term Assessment Capability Applied to the Westinghouse Lead Fast Reactor • S. J. Lee • Fauske & Associates, LLC	

 Gould 1 Room	T07	Reactor Analysis	Chairs : J.L. François • National Autonomous University of Mexico & A. Nicolas • CEA Saclay
	02:30 - 02:50	073 • Simulation of transients in fuel-water mixtures • P. Boulard • CEA	
	02:50 - 03:10	162 • Impact of core power variations on the fast neutron flux incident on pressurized water reactor vessels • R. Vuiart • IRSN	
	03:10 - 03:30	260 • Neutronic study of a sodium cooled fast reactor core with metallic thorium-based fuel • J.-L. François • National Autonomous University of Mexico	
	03:30 - 03:50	263 • Application of TULIP/STREAM code in 2-D Fast Reactor Core Neutronic Analysis • X. Du • UNIST	
	03:50 - 04:10	284 • A new data-driven approach for noisy data with physical constraints: application to nuclear reactor physics • H. Gong • NPIC	
	04:10 - 04:30	296 • Graphite Moderation in Fast Reactors • F. Heidet • Argonne National Laboratory	

 Gould 2 Room	T01	SMR1	Chair : E. Courtin • Framatome
	02:30 - 02:50	392 • Investigation on Xenon Transient Effect for SMR Nuclear Design with K-mode Daily Load-following Operation • B. Jo • KINGS	
	02:50 - 03:10	287 • Long-cycle Soluble Boron-free SMPWR with Zircaloy Reflector • J. Jang • Ulsan National Institute of Science and Technology	
	03:10 - 03:30	247 • Flow stability analysis on HAPPY200 • C. Liu • State Power Investment Corporation Research Institute	
	03:30 - 03:50	316 • Steady-state Thermal-hydraulic Analysis of Nuclear Heating Reactor HAPPY200 • C. Sun • State Power Investment Corporation Research Institute	

 Bechet Room	T05	Operation, Performance & Reliability Management	Chair : P. Morilhat • EDF
	02:30 - 02:50	149 • Communication Characteristics of Human Operators under emergency situation in Advanced Main Control Room • S. Kim • KAERI	
	02:50 - 03:10	230 • Development of Diagnosis System with Complex Abnormalities for Nuclear Power Plants • J. M. Kim • Ulsan National Institute of Science and Technology	
	03:10 - 03:30	022 • Progress in Loose Parts Monitoring • G. Gloth • Framatome GmbH	
	03:30 - 03:50	199 • UAS Based Remote Sensing for Nuclear Power Plants • M. Kazemeini • University of Nevada-Las Vegas	
	03:50 - 04:10	137 • MLE Localization of Radiation Sources in Aerial Remote Sensing • A. Barzilov • University of Nevada-Las Vegas	

 Armstrong Room	T10	Seismic Assessment	Chairs : H. Koike • Nuclear Development Corporation & C. Petesch • CEA
	02:30 - 02:50	005 • A study on the seismic analysis method for main steam interface piping system in a base-isolated nuclear power plant • D. Kim • KEPSCO	
	02:50 - 03:10	081 • PIRAT – An Analytical Tool for Insertion Reliability Assessment of Reactivity Control Systems • M. Bonney • French Center for Atomic and Alternative Energy	
	03:10 - 03:30	215 • Similitude law development and seismic test for the scale model of NPP spent fuel pool • H. Kang • KAERI	
	03:30 - 03:50	262 • Comparison of Sodium Fast Reactor Core Assembly Seismic Evaluation using the Japanese and French simulation tools • T. Yamamoto • JAEA	
	03:50 - 04:10	356 • Investigation on Effect of Seismic Loading Method on Structural Integrity of Safety Class 1 Components • J.-S. Kim • Sejong University	

	04:30	Break _____  Gould Area
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	05:00	Plenary 1 • Nuclear New Build & Operation _____  Antipolis Amphitheater
		Chairs : ▸ T. Hattori • JAIF ▸ D. Hoffman • ANS Speakers : ▸ G. Strati • CNL ▸ I. Leboucher • EDF ▸ J-B. Ville • Framatome ▸ K. H. Bae • KAERI ▸ A. Rozhdestvin • Rosatom
	07:30	End of the day

MAY, TUESDAY 14

	07:30	Registration _____  Congress Center - Level 2
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	08:00	Plenary 2 • Future Nuclear Energy Systems _____  Antipolis Amphitheater
	Chairs :	• J. Buongiorno • MIT • N. Camarcat • EDF / ENSII
	Speakers :	• P. Stohr • CEA • Z. Zhang • INET • H. Kamide • JAEA / Forum Gen-IV • V. Pershukov • Rosatom

	10:00	Break _____  Gould Area
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	10:30	Technical Sessions 2 in parallel
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 Antipolis Amphi.	T08	CFD scale validation	Chair : U. Bieder • CEA
	10:30 - 10:50	189 • CFD Analyses of Water-Based Alumina Nanofluids in Subchannel of a Standard Pressurized Water Reactor • B. Almutairi • Missouri University of Science and Technology	
	10:50 - 11:10	046 • Large-Eddy Simulation of Thermal-Mixing Pipe-Flow close to a Horizontal T-Junction with Flow-Rate Variations in the Branch Pipe • E. Laurien • INTES, University of Stuttgart	
	11:10 - 11:30	087 • Analytical and Experimental Study of Condensation and Collapse of Steam Bubbles at high Jakob number • A. Ponomarev • Paul Scherrer Institute	
	11:30 - 11:50	209 • Investigation on the effects of OECD-ATLAS Pressurized Vessel Lower Plenum Blockage on the Pressure Drop and Flow Regime • Y. Addad • Khalifa University	
	11:50 - 12:10	228 • LES study on baffle jets impinging on fuel rods • U. Bieder • CEA	
	12:10 - 12:30	307 • An Introduction to the Header Test Facility at CNL • J. Yang • Canadian Nuclear Laboratories	

 Fitzgerald Room	T03	Technology	Chair : M. Frignani • Ansaldo
	10:30 - 10:50	048 • Dry Cleaning Process Test for Fuel Assembly of Fast Reactor Plant System (II) • A. Ide • Mitsubishi FBR Systems, Inc.	
	10:50 - 11:10	057 • CEA R&D program on sealing issues for the SFRs • K. Vulliez • CEA	
	11:10 - 11:30	068 • Dry Cleaning Process Test for Fuel Assembly of Fast Reactor Plant System (I) Pilot Scale Test for Fuel Pin Bundle • H. Kudoh • Mitsubishi Heavy Industries, Ltd.	
	11:30 - 11:50	217 • Status of new safety measures considered for European Sodium Fast Reactor in the ESFR-SMART project • J. Guidez • CEA	
	11:50 - 12:10	305 • Virtual Reality: Added Value for Advanced Reactor Design • J.-M. Hamy • Framatome	

 Davis Room	T07	Modelling & Methodology	Chairs : C. Poinot-Salanon • CEA & F. Damian • CEA
	10:30 - 10:50	104 • Hybrid stochastic-deterministic method of generating one-group cross sections for transient analysis applied to Sodium Fast Reactor • J. Bodi • Paul Scherrer Institut	
	10:50 - 11:10	107 • Analysis of calculation scheme of APOLLO3 applied to moderated SFR fuel assembly • M. Zajackowski • CEA	
	11:10 - 11:30	159 • Multi-physics simulations with TRIPOLI-4® and Serpent 2: coupling neutron transport with the sub-channel code SUBCHANFLOW • M. Faucher • CEA	
	11:30 - 11:50	276 • Application of Monte Carlo Neutronics and Fuel Performance Coupled Codes to Whole-core Depletion of OPR-1000 • Q. T. Tran • Ulsan National Institute of Science and Technology	
	11:50 - 12:10	041 • Design of a simulator-oriented PWR model and optimization of load-follow operations • V. Drouet • CEA	

 Gould 1 Room	T08	Code & Model Development	Chair : A. Dyon • EDF
	10:30 - 10:50	094 • THEDI: a multi-1D two-phase flow solver for neutronic codes • C. Patricot • CEA	
	10:50 - 11:10	183 • Nodalization Sensitivity Analysis of the AP1000 Containment with the MELCOR code • C. Vazquez-Rodriguez • Universidad Politécnica de Madrid	
	11:10 - 11:30	184 • A Computer Code for Thermal-hydraulic Analysis of Steam Generator with Axial Pre-heater/economizer • G. Wu • Nuclear Power Institute of China	
	11:30 - 11:50	222 • Correlated Coefficients Based Pressurizer Model • W. Ratemi • University of Tripoli, Libya	
	11:50 - 12:10	236 • Construction of flow regime transition criterion between dispersed bubble flow and intermittent flow under rolling condition • T. Xie • Nuclear Power Institute of China	
	12:10 - 12:30	319 • Nonlinear analysis of pressure drop oscillations in parallel channels • M. E. Rahman • Indian Institute of Technology Bombay	

 Gould 2 Room	T06	Progress in Reactor Physics Data & Methods for Safety	Chair : P. Blaise • CEA
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	10:30 - 10:50	393 • Importance of the Doppler Constant and of the fuel temperature evaluation for the design of a 'CADOR' core • P. Sciora • CEA Cadarache
	10:50 - 11:10	403 • Improvement of the Doppler Feedback Accuracy in CTF-PARCS Coupled Simulations using CTFFuel Module • A. Jimenez Carrascosa • UPM
	11:10 - 11:30	401 • N° Analysis of the Doppler feedback reactivity in RIA power transients – Application to the CABRI reactor • O. Clamens • CEA
	11:30 - 11:50	191 • Computational Modeling of Doppler Coefficient For 3D AGR Pin-Cell Using The Coupling of Deterministic Method & Matlab • B. Almutairi • Missouri University of Science and Technology

Bechet Room	T09	Recycling	Chair : V. Garat • Orano
		10:30 - 10:50	188 • Development of Granulation System for Simplified MOX Pellet Fabrication Process • K. Ishii • JAEA
		10:50 - 11:10	148 • Study on optimizing the microwave heating denitration method and powder characteristics of uranium trioxide • T. Segawa • JAEA
		11:10 - 11:30	079 • Conceptual study of fuel cycle option with METMET and composite fuel for LWR's • A. Savchenko • A.A. Bochar Institute - Rosatom
		11:30 - 11:50	381 • MULTIRECYCLING OF MOX FUEL ON LWRs • Y. Rugama • Framatome

Armstrong Room	T11	Nuclear & Integrated Energy Systems	Chairs : J. Buongiorno • MIT E. Girardi • EDF
		10:30 - 10:50	058 • How much carbon could nuclear reactors displace in the U.S. process heat markets? • J. Buongiorno • MIT
		10:50 - 11:10	343 • The Role of Nuclear in the Mexican Power System • C. Martin-del-Campo • National Autonomous University of Mexico
		11:10 - 11:30	412 • The use of real option approach to assess the value of decisions in nuclear fuel cycle scenarios: methodological approach and illustrative example • M. Berthelemy • CEA
		11:30 - 11:50	083 • An autonomous circulation miniature integrated nuclear reactor with direct power output design • Q. Zhou • Tsinghua University
		11:50 - 12:10	232 • Hydro-thermal Assessment around Triangularly Positioned PCM Containers in a Hybrid TES-Nuclear Power Plant System • A. Alkaabi • Khalifa University of Science and Technology
		12:10 - 12:30	202 • Heat storage for variable electricity production in SFR: preliminary architecture and transient results • P. Gauthé • CEA Cadarache

	12:30	Lunch Period • Sponsored by CEA _____ Gould Area
		Mentoring Session • Peers, students & young professionals will exchange on knowledge, skills & professional development goals.

01:45	Technical Sessions 3 in parallel
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Antipolis Amphi.	T08	Validation for advanced reactors	Chairs : C. Geffray • CEA & E. Girardi • EDF
		01:45 - 02:05	069 • Thermal-Hydraulic Investigations on the Transition from Forced to Natural Convection in a Closed Experimental Loop • A. Papukchiev • GRS GmbH
		02:05 - 02:25	156 • Experimental Study on Flow-Induced Vibration of Rectangular Cylinder with Rounded Corners • Y. Wu • Tsinghua University
		02:25 - 02:45	243 • Results of the PHENIX Dissymmetric Test Benchmark Exercise • C. Geffray • CEA
		02:45 - 03:05	258 • Investigation of the applicability of the MC3D code to vapour explosions in sodium • M. Uršič • Jožef Stefan Institute
		03:05 - 03:25	317 • Assessment of CATHARE code against passive system experiment • C. Peng • Nuclear Power Institute of China

Fitzgerald Room	T03	Economy	Chair : D. De Bruyn • SCK CEN
		01:45 - 02:05	214 • ASTRID SFR - Use of design space exploration in component and system design • A. Woaye Hune • Framatome
		02:05 - 02:25	241 • Levelized cost of electricity evaluation of SFR system considering safety measures • K. Mukaida • JAEA
		02:25 - 02:45	280 • ESFR SMART Organization of a pit justifying the option of safety vessel suppression • J. Guidez • CEA
		02:45 - 03:05	309 • Impact of safety design enhancements on JSFR construction cost • A. Katoh • JAEA
		03:05 - 03:25	376 • ALFRED staged approach • M. Frignani • Ansaldo Nucleare S.p.A.

Davis Room	T07	VVUQ 1/2	Chairs : P. Blaise • CEA & E. Ivanov • IRSN
		01:45 - 02:05	011 • Multi-cycle Analysis of VERA Benchmark with Monte Carlo Whole-core Depletion Code MCS • D. C. T. Nguyen • UNIST
		02:05 - 02:25	020 • Benchmarking 2D/1D Synthesis Method Against 3D Methods for Flux Calculations Outside of the Reactor Beltline Region • Y-H Huang • National Tsing Hua University
		02:25 - 02:45	088 • About the impact of the Unresolved Resonance Region in Monte Carlo simulations of Sodium Fast Reactors • A. Jiménez-Carrascosa • Universidad Politécnica de Madrid
		02:45 - 03:05	151 • Development and Testing the Deterministic Neutronics Model of the New Paks Units • E. Temesvari • MTA EK, Hungarian Academy of Sciences
		03:05 - 03:25	154 • A Validation Study of a Neutronics Design Methodology for Fast Reactors Using Reaction Rate Distribution Measurements in the Fast Reactor Prototype Monju • K. Ohgama • JAEA
		03:25 - 03:45	235 • Verification of MOC Transient Solver in Neutron Transport Code STREAM • K. H. N. Nguyen • UNIST

Gould 1 Room	T02	HTR thermal-hydraulics & Miscellaneous		Chair : C. du Toit • North-West University & D. Hittner • LGI Consulting
		01:45 - 02:05	155 • Engineering verification experiments of the helical tube once through steam generator of HTR-PM • X. Li • Tsinghua University	
		02:05 - 02:25	172 • Numerical study on the temperature non-uniformity in large scale helical tube bundles • X. Li • Tsinghua University	
		02:25 - 02:45	047 • Analysing the porosity of a pebble bed core using a combined analytical and numerical approach • C. Du Toit • North-West University	
		02:45 - 03:05	142 • Thermal Model Details and Description of the AGR-5/6/7 Experiment • G. Hawkes • Idaho National Laboratory	
		03:05 - 03:25	386 • The GEMINI+ project paves the way for an early deployment of industrial nuclear cogeneration • D. Hittner • LGI Consulting	
		03:25 - 03:45	122 • A Numerical Study on Graphite Dust Deposition and Release in the High-temperature Gas-cooled Reactor (HTGR) • Y. Zhang • Tsinghua University	

Gould 2 Room	T06	Advanced Experimental Devices		Chair : D. Paladino • Paul Scherrer Institut
		01:45 - 02:05	407 • IN-EX Facility – Qualification of Measurement Devices under Thermophysical Boundary Conditions inside a LWR Containment in the Course of a Severe Accident • A. Bentaib • IRSN	
		02:05 - 02:25	410 • Modelling of the interaction of two heat sources simulating the thermal effects of PARs • M. Andreani • Paul Scherrer Institut	
		02:25 - 02:45	063 • Containment instrumentation survival under a SA with harsh pressure and temperature conditions • C. Vazquez-Rodriguez • Technical University of Madrid	
		02:45 - 03:05	225 • A new measuring method for elemental ratio and Vickers hardness of metal-oxide-boride materials based on Laser-Induced Breakdown Spectroscopy (LIBS) • Y. Abe • JAEA	
		03:05 - 03:25	409 • High Spatial Resolution PIV Measurements in the PANDA Facility • R. Kapulla • PSI	

Bechet Room	T04	Molten Salt Reactors & Other Advanced Reactors 1/2		Chairs : R. Scarlat • University of California - Berkeley & S. Delpech • CNRS
		01:45 - 02:05	219 • Molten Salt Reactor to close the fuel cycle. Example of MSFR multirecycling applications • J. Guidez • CEA	
		02:05 - 02:25	278 • Reactor chemistry of next generation nuclear systems and structural materials behavior • C. Cabot • CEA	
		02:25 - 02:45	259 • Motivations and Basic Options for a Molten Salt Reactor Concept • S. Beils • Framatome	
		02:45 - 03:05	245 • Core and Fuel Cycle Performance of a Molten Salt Fast Reactor • B. Feng • Argonne National Laboratory	
		03:05 - 03:25	128 • Transition to closed Th-U fuel cycle in fluoride salts based fast MSR • J. Krepel • Paul Scherrer Institut	

Armstrong Room	T10	Design life assessment		Chairs : H. Koike • Nuclear Development Corporation & T. Lebarbé • CEA
		01:45 - 02:05	112 • Impact parameter study of the graphite components in HTR-PM • L. Shi • Tsinghua University	
		02:05 - 02:25	035 • Parametric study of swelling under irradiation behavior of 15Cr / 15Ni austenitic steels using cluster dynamics • A. Vaugoude • CEA	
		02:25 - 02:45	135 • Adaptation of standards to innovative reactors • C. Petesch • CEA	
		02:45 - 03:05	175 • Investigation of Damage Accumulation During Fatigue on Incoloy 800H Using Digital Image Correlation • S. Jianguang • Tsinghua University	

	03:45	Break		Gould Area
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	04:45	Technical Sessions 4 in parallel		
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Fitzgerald Room	T08	System code validation		Chair : R. Denèfle • EDF
		04:45 - 05:05	049 • Integrated Uncertainty Analysis of the LOFT LP-FP-2 Experiment using RELAP/SCDAPSIM/MOD3.5 with IUA • B. Kędzierska • CERN	
		05:05 - 05:25	239 • Qualification of the CATHARE-3 one-dimensional transient rotodynamic pump model on DERAP two-phase cavitating tests • L. Matteo • CEA	
		05:25 - 05:45	246 • Development and Validation of the Two-Phase Flow Analysis Capability of a Drift-flux Model based Core Thermal-Hydraulics Code ESCOT • A. Facchini • Seoul National University	
		05:45 - 06:05	252 • Performance of Indirect Dry Air-cooled Condenser based on Pressure Transition Temperature for SMR Application • D. Shin • Hanyang University	
		06:05 - 06:25	370 • Modification of a diffusion layer model for condensation inside the containment using a turbulent diffusion coefficient • J. Y. Lee • Pusan National University	
		06:25 - 06:45	411 • Numerical and experimental studies on dynamic contact of tube and baffle supports in heat exchanger for main coolant pump • B. Zhu • Dalian University of Technology	

Davis Room	T03	In Service Inspection & Repair and Instrumentation		Chair : F. Baqué • CEA
		04:45 - 05:05	103 • Development of Under Sodium Viewer for Next Generation Sodium-cooled Fast Reactors - Imaging test in sodium • K. Aizawa • JAEA	
		05:05 - 05:25	132 • French developments for improving In Service Inspection of SFRs • F. Baqué • CEA	
		05:25 - 05:45	133 • Progress in the development of the core control and monitoring measurements system of the French GEN-IV SFR • J. Bonnin • CEA	

05:45 - 06:05	226 • Development of Prototype Reactor Maintenance (3) Application to valves of sodium-cooled reactor prototype • Y. Chikazawa • JAEA
06:05 - 06:25	256 • Astrid core instrumentation strategy • M. Trevisiol • CEA

Gould 1 Room	T01	SMR2		Chair : P. Dumaz • CEA
		04:45 - 05:05	113 • Transient Response Analysis of S-CO2 Brayton Cycle Coupled to Water-cooled Small Modular Reactor with MARS-KS Code • J. Y. Baek • KAIST	
		05:05 - 05:25	054 • Study of D2O/H2O-cooled thorium-fueled PWR-like SMR cores using the KNACK toolbox: conversion and safety assessment • A. Nuttin • LPSC	
		05:25 - 05:45	330 • Cooling Sustainability Assessment of Passive Residual Heat Removal System coupled with Dry Air Cooling System for SMR • M.W. Na • Hanyang University	
		05:45 - 06:05	329 • Safety Analysis for the Major Design Basis Events in Passive PWR SMART • K. H. Bae • KAERI	
		06:05 - 06:25	212 • Numerical Study of Multi-stage Safety Injection Tank • S. J. Shin • KAERI	

Gould 2 Room	T06	Probabilistic Safety & Sensitivity Analysis / SA		Chairs : P. Meloni • ENEA, J-M Evrard • CEA & A. Bentaib • IRSN
		04:45 - 05:05	051 • A strategy for establishing the component reliability data used in the probabilistic safety assessment of molten salt reactor • Q. Yang • Shanghai Institute of Applied Physics	
		05:05 - 05:25	408 • Gas Redistribution Caused by Interacting Heat Sources in the Presence of a Vertical Condenser • S.S. Paranjape • Paul Scherrer Institut	
		05:25 - 05:45	131 • Leak mitigation with the FRAMATOME Adhesive Technology by Manual or Manipulator Application • R. Lehr • Framatome GmbH	
		05:45 - 06:05	161 • Combined Thermal-mechanical and Thermal-hydraulic Analyses in a Pressurized Surge Line • H. Uitslag-Doolaard • Nuclear Research and Consultancy Group	

 Bechet Room	T04	Molten Salt Reactors & Other Advanced Reactors 2/2		Chairs : J.Guidéz • CEA & S. Beils • Framatome		
		04:45 - 05:05	182 • Development and Application of the System Analysis Module (SAM) for Simulation of Passive Cooling Systems in Salt Reactors • K. Ahmed • University of Wisconsin-Madison			
		05:05 - 05:25	367 • Infrared Spectroscopy Studies of Molten Fluoride Salts • W. Derdeyn • University of Wisconsin-Madison			
		05:25 - 05:45	231 • DNS of Molten Salt Bubble Growth with PSI-BOIL • K. W. Wong • Paul Scherrer Institut			
		05:45 - 06:05	013 • The conceptual design of heat-pipe cooled and calcium hydride moderated vSMR • R. Kimura • Toshiba Energy Systems & Solutions			
		06:05 - 06:10	363 • Modeling of Tritium transport and absorption in the PB-FHR core using TRIDENT and the System Analysis Module (SAM) • F. Ambrogi • University of Wisconsin-Madison			

 Armstrong Room	T06	Code validation		Chair : <i>Confirmed soon</i>
		04:45 - 05:05	395 • Validation of RELAP5-3D thermal-hydraulic code against full-scale PERSEO Test 9 • A. Bersano • Politecnico di Torino	
		05:05 - 05:25	396 • Test Campaign and RELAP5 Post-Test Analysis on the Bayonet Tube HERO-2 Component • M. Polidori • ENEA	
		05:25 - 05:45	404 • Experiments based benchmarking: lessons learned from IRPhEP • E. Ivanov • IRSN	

06:45	Keynote 1 • Do we need Nuclear for a deeply Decarbonated Energy System? _____ Antipolis Amphitheater
Speakers :	• S. Bilbao y Leon • OECD-NEA • J. Buongiorno • MIT

07:45	Transition
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08:00	Bus Transfer _____ Meeting Point : In Front of the Main Entrance of the Conference Center
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08:30	Congress Reception _____ Bastide du Roy
Awards Ceremony :	• ENS High Scientific Council 2018 PhD Award • ICAPP 2019 Best Student Pitch Audience Award

11:00	End of the day
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MAY, WEDNESDAY 15

	07:30	Registration _____  Congress Center - Level 2
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	08:00	Plenary 3 • Nuclear Fuel & Sustainability _____  Antipolis Amphitheater
Chairs :		
▸ N. Allimann • Orano ▸ K. Sakai • JNFL		
Speakers :		
▸ B. Feng • ANL ▸ D. Goddard • NNCL ▸ A. Shadrin • Rosatom		

	09:45	Break _____  Gould Area
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	10:15	Technical Sessions 5 in parallel
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 Antipolis Amphi.	T08	<i>Experiment & Scaling Analysis</i>	Chair : G-L. Lagier • TechnicAtome
		10:15 - 10:35	021 • Void Fraction in a Vertical Pipe under Countercurrent Flow Limitation at Its Upper End • M. Murase • Institute of Nuclear Safety System, Inc.
		10:35 - 10:55	028 • Two-phase Flow Void Fraction Estimation from the Raw Data of an Electrical Impedance Tomography Sensor • C. Dang • CEA Cadarache
		10:55 - 11:15	052 • Dynamic three-dimensional temperature distribution reconstruction by the distributed optical fiber sensing in NNCL • Q. Yang • Shanghai Institute of Applied Physics
		11:15 - 11:35	077 • Unsteady pressure and velocity measurements in 5x5 rods bundle using grids with and without mixing vanes • L. Rossi • CEA cadarache
		11:35 - 11:55	106 • System Effect of Hybrid SIT on Thermal Hydraulic Behavior during a station black out condition • S. Cho • KAERI
		11:55 - 12:15	129 • Scaling of Experiments on Containment Atmosphere Mixing to Nuclear Power Plant • R. Krpan • Jožef Stefan Institute

 Fitzgerald Room	T03	<i>General</i>	Chair : J. Krepel • PSI
		10:15 - 10:35	502 • Gen IV Programs at CEA • N. Devictor
		10:35 - 10:55	126 • Contribution of the ASTRID reactor to the development of the next generation of industrial Sodium-cooled Fast Reactors • C. Döderlein • CEA
		10:55 - 11:15	364 • The Westinghouse Lead Fast Reactor program • P. Ferroni • Westinghouse Electric Company LLC
		11:15 - 11:35	064 • Recent progress and perspectives in the Belgian MYRRHA ADS programme • D. De Bruyn • SCK-CEN
		11:35 - 11:55	377 • Progress in GFR technology • A. Vasile • CEA
		11:55 - 12:15	501 • IAEA Activities • C. Batra

 Davis Room	T07	<i>Multiphysics</i>	Chairs : A. Nuttin • LPSC & F. Damian • CEA
		10:15 - 10:35	254 • Development of a multiphysics Best-Estimate approach for LWR reference calculation • P. Cattaneo • CEA Saclay
		10:35 - 10:55	270 • MCS/FRAPCON Multi-physics Coupled Simulation of Westinghouse 3-loop PWR Wholecore Analysis • B. Ebiwonjumi • Ulsan National Institute of Science and Technology
		10:55 - 11:15	299 • Multi-cycle analysis on OPR1000 type reactor using multi-physics coupled calculation of RAST-K and FRAPCON • H. Kim • UNIST
		11:15 - 11:35	322 • Multi-physics Assessment of Reduced-moderation Pressurized Water Reactor using Thorium Fuel • H. Lee • UNIST
		11:35 - 11:55	334 • Comparison of reactivity estimation performance between the extended Kalman filter and the unscented Kalman filter • X. Peng • Nuclear Power Institute of China

 Gould 1 Room	T01	<i>Tools and prospects for LWR optimisation</i>	Chair : F. Morin • CEA
		10:15 - 10:35	311 • Core Design of RBWR (Resource-renewable Boiling Water Reactor) and Benchmark Calculation of Core Analysis Tools • T. Hino • Hitachi, Ltd.
		10:35 - 10:55	036 • Prediction of the core cycle performance of a PWR Pre-Konvoi unit by the linear reactivity model • N. Gérard Castaing • CEA

	10:55 - 11:15	167 • DEDALE: a Software for Routing Cables and Optimizing their Path in Power Plants • L. Grillotti • EDVANCE
	11:15 - 11:35	176 • Quantitative Analysis of Advanced Concrete Technologies for Cost Reduction of Nuclear Power Plants • P. Champlin • Massachusetts Institute of Technology

Gould 2 Room	T06	Safety Assessment Methodology 1/2	Chair : E. Ivanov • IRSN
	10:15 - 10:35	195 • Physical Security Analysis and Simulation of the Multi-Layer Security System for the Offshore Nuclear Plant (ONP) • J. Buongiorno • MIT	
	10:35 - 10:55	398 • Analysis of a 2-inches guillotine break of the DVI line in an IRIS-like design by using ASTEC code • P. Maccari • University of Bologna	
	10:55 - 11:15	372 • Application of Design Extension Conditions (DEC) and practical elimination to EPR design • E. Courtin • Framatome	
	11:15 - 11:35	163 • Numerical Prediction of a Single Phase PTS Scenario for the Crack Assessment in a RPV Wall • H. Uitslag-Doolaard • Nuclear Research and Consultancy Group	
	11:35 - 11:55	295 • Evaluation of Station Blackout Risk with Electrical Cross-tie in Multi-unit NPP • J.K. Al Suwaidi • Federal Authority for Nuclear Regulation	

Bechet Room	T09	Reprocessing	Chair : A. Salvatores • CEA
	10:15 - 10:35	347 • Real-Time Solution Analysis in Microfluidic Channels using Raman Spectroscopy • S. Bryan • Pacific Northwest National Laboratory	
	10:35 - 10:55	298 • On-line monitoring of chemical composition to enable process control of the CoDCon flowsheet • A. Lines • Pacific Northwest National Laboratory	
	10:55 - 11:15	394 • Reprocessing Technologies for U-Pu Mixed Oxide and Nitride Used Nuclear Fuel • A. Shadrin • Innovative and Technology Center of Project PRORYV	
	11:15 - 11:35	306 • Extraction of zirconium in the Molten Salt Fast Reactor • S. Delpech • CNRS	

Armstrong Room	T10	Corrosion and Protection Methods	Chair : C. Cabet • CEA
	10:15 - 10:35	039 • Elemental distribution in oxide film formed during hydrogen penetration using dual exposed specimen • Z. Wang • Tohoku University	
	10:35 - 10:55	281 • Effect of cold work on stress corrosion cracking of Alloy 690 in simulated primary water of nuclear power plant • H.P. Kim • KAERI	
	10:55 - 11:15	294 • Oxidation test results on CrN coated austenitic stainless steel 316L in high temperature steam • S. Penttila • VTT Technical Research Centre of Finland Ltd.	

	12:15	Lunch Period  Gould Area & Posters Spots Ending
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	01:30	Technical Sessions 6 in parallel
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Fitzgerald Room	T08	Sunchannel Analysis & CHF	Chair : L. Rossi • CEA
	01:30 - 01:50	059 • Integrated Uncertainty Analysis of Selected PHEBUS FPT Experiments using RELAP/SCDAPSIM/MOD3.5 with IUA • J. Hohorst • Innovative Systems Software	
	01:50 - 02:10	119 • Effects of surface state and fluid properties on Critical Heat Flux – Literature review and experiments • M. Bottin • CEA Cadarache	
	02:10 - 02:30	267 • Verification and Validation of Subchannel Analysis Code CORTH • X. Wang • Nuclear Power Institute of China	
	02:30 - 02:50	277 • Analysis of flow in rod bundles with velocity and temperature radial dissymmetry using CATHARE-3 • Q. Fu • CEA	
	02:50 - 03:10	297 • Accident mitigation by Core makeup system for APR1400 • H. J. Yoon • Khalifa University of Science and Technology	

Davis Room	T03	Core	Chairs : B. Fontaine • CEA & P. Vacha • UJV Rez, a.s.
	01:30 - 01:50	090 • An innovative approach for minor actinides transmutation: in-core minor actinides bearing targets • T. Kooyman • CEA Cadarache	
	01:50 - 02:10	115 • Some considerations on the design of a small versatile fast reactor • T. Kooyman • CEA Cadarache	
	02:10 - 02:30	072 • Methodology to define the Sodium-Cooled Fast Reactor core flow zone • A. Conti • CEA	
	02:30 - 02:50	152 • A Design Study on a Mixed Oxide Fuel Sodium-cooled Fast Reactor Core Partially Loading Highly Concentrated MA-containing Metal Fuel • K. Ohgama • JAEA	

Gould 1 Room	T07	VVUQ 2/2	Chairs : D. Kerdran • EDF S.A. & A. Nicolas • CEA Saclay
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	01:30 - 01:50	282 • Sensitivity Study of BEAVRS Benchmark Cycle 1 with Monte Carlo Multi-physics Analysis • H. Lee • Ulsan National Institute of Science and Technology
	01:50 - 02:10	313 • Validation of MCS coupled neutron/photon mode against SINBAD shielding benchmarks • M. Lemaire • Ulsan National Institute of Science and Technology
	02:10 - 02:30	335 • Validation of APOLLO3 reference decay chain for SFR burn-up calculation • M. Foissy • CEA Cadarache
	02:30 - 02:50	339 • Neutronics Simulation of Micro Nuclear Reactors Using High-Fidelity Neutron Transport Code PROTEUS • B. Feng • Argonne National Lab
	02:50 - 03:10	359 • ANDROMEDE calculations on MIT BEAVRS benchmark • D. Kerdraon • EDF S.A.

 Gould 2 Room	T06	Safety Assessment Methodology 2/2	Chair : C. Herer • IRSN
	01:30 - 01:50	140 • IRSN activities related to passive safety systems assessment • C. Herer • IRSN	
	01:50 - 02:10	193 • Strategy of mitigating LOFW-ATWT accident on design extension condition for advanced third generation pressurized NPP • S. Zhang • Nuclear Power Institute of China	
	02:10 - 02:30	301 • Study on Capturing Nozzle Design Configurations for Consequence Mitigation of Steam Generator tube Rupture Accident (SGTR) • S. Ullah • KAIST	
	02:30 - 02:50	174 • Toward Conservatism in Containment Design Basis Accident Analyses. Lumped Parameters and 3D Approaches • C. Vazquez-Rodriguez • Universidad Politécnica de Madrid	
	02:50 - 03:10	288 • Case Study on Soil Remediation Experience in the U.S • H. Lee • KEPCO International Nuclear Graduate School	

 Bechet Room	T09	Scenarios 1 Waste	Chair : C. Evans • Orano
	01:30 - 01:50	026 • Development of a multi-zone irradiation model for scenario studies involving ASTRID-like SFRs • L. Tillard • IRSN	
	01:50 - 02:10	327 • A Study on the Structural Integrity Evaluation of Roll Compacted Radioactive Wastes Solidification • M. Jung • Chosun University	
	02:10 - 02:30	085 • Evaluation of Adsorption Properties of Am(III) for Various Inorganic Adsorbents • H. Mimura • Union Show K.K.	
	02:30 - 02:50	116 • Italian radioactive waste management • R. Testoni • Politecnico di Torino	
	02:50 - 03:10	117 • On the use of plutonium burning fast reactors to reduce PWR irradiated assemblies' stockpile • T. Kooyman • CEA Cadarache	

 Armstrong Room	T10	Innovative Materials and Fabrication	Chairs : N. Oono-Hori • Hokkaido University & Y. de Carlan • CEA Saclay
	01:30 - 01:50	040 • Development of an austenitic/martensitic gradient steel by powder metallurgy : Spark Plasma Sintering and additive manufacturing • F. Villaret • CEA	
	01:50 - 02:10	108 • Fabrication and characterization of 15Cr-15Ni austenitic steel cladding tubes for sodium fast reactors • P. Olier • CEA	
	02:10 - 02:30	178 • Advanced Test Reactor Cycles 160A-1 through 164A-1 • N. Manwaring • Idaho National Lab	
	02:30 - 02:50	109 • Precipitation kinetics analysis of oxide dispersion strengthened steels for their application as cladding material in Gen.IV power plants • G. Spartacus • CEA Saclay	

	03:15	Break _____  Antipolis Amphitheater Lobby
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	03:45	Keynote 2 • Nuclear Solutions for Space _____  Antipolis Amphitheater
	Moderator :	▸ V. Faudon • SFEN
	Speaker :	▸ R. Ballard • NASA

	04:45	Closing Session _____  Antipolis Amphitheater
	Speaker :	▸ F. Carré • CEA

	05:00	ICAPP 2019 • Closing Drinks _____  Rooftop of the Congress Center
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POSTERS

📍 Poster presentations will be displayed from Monday 01:00 PM to Wednesday 01:00 PM.
Discussions between authors and participants will be encouraged during breaks.

T03

• Fast Neutron Reactors

Safety	160 • Severe accident simulation from the onset to the impact on the vessel – the SIMMER/EUROPLEXUS chaining • L. Andriolo • EDF
Technologies	098 • Evaluation of nuclear reactor availability at conceptual design stage • L. Gresset • Framatome
	110 • How to cool down the upper closures of a sodium-cooled fast reactor? • M. Ayrault • Framatome
	125 • Development of an innovative hydraulic dashpot for ASTRID diverse control rods • B. Perrin • Framatome
	166 • Optimization of a sodium-cooled fast reactor operation with a gas power conversion system during a loss of off-site power • A. Grange • CEA
	218 • Sodium Fast reactors: consequences of caustic corrosion under stress, on their design and their operation • J. Guidez • CEA
	269 • Routing Study of Above Core Structure with Mock-up Experiment for ASTRID • K. Takano • JAEA
	358 • Preliminary Study of Sodium Heat Pipe Safety System of Hybrid Micro Modular Reactor (H-MMR) for Normal Operation • Y. J. Choi • KAIST
	082 • Validation of Fast Reactors decay heat calculations: experimental and methodological aspects • A. Calame • CEA Cadarache
Core	130 • ESFR-SMART core burnup calculation on radially infinite lattice with Monte-Carlo code • J. Krepel • Paul Scherrer Institut
	139 • Evaluation of the Control Rods Withdrawal in a Small Modular Sodium Fast Reactor and Analysis of the Impact on the Core Design • H. Guo • CEA Cadarache
	158 • Neutron shielding calculations in fast reactors with APOLLO3: identification of important physical phenomena • A. Hajji • CEA Cadarache
	168 • Benchmarking ATHLET against TRACE as applied to Superphenix start-up tests • V.A. Di Nora • Helmholtz-Zentrum Dresden Rossendorf
	177 • Analysis of the feedback coefficients of the Superphenix start-up core with APOLLO3 • E. Garcia • CEA Cadarache
	271 • MCS Analysis of 1000 MWth Sodium-Cooled Fast Reactor • V. Dos • Ulsan National Institute of Science and Technology
	378 • An improved design for the ALFRED core • G. Grasso • ENEA
	379 • Progress in the ALLEGRO Project - Neutronics and Thermal-Hydraulics • P. Vácha • UJV Rez
	387 • Development of SOFI 3D, a predictive methodology with 3D CFD code for calculation of mechanical and thermal consequences in a room in case of spray sodium fire • A. Lemarchand • Framatome
	388 • ASTRID primary sodium activation • F. Vaiana • Framatome

T04

• Molten Salt Reactors & Other Advanced Reactors

127 • Assessment of waste burning in open cycle of two fluids chloride MSR • J. Krepel • Paul Scherrer Institut
363 • Modeling of Tritium transport and absorption in the PB-FHR core using TRIDENT and the System Analysis Module (SAM) • F. Ambrogi • University of Wisconsin-Madison

T06

• Plant Safety Assessment, Regulatory & Licensing Issues

055 • Performance Comparison of Reactor Accident Classification Model using Dynamic Bayesian Network and Long Short-term Memory • C. Oh • KAIST
173 • Impact of grid pressure drop uncertainties on MDNBR penalty for mixed core • L. Monti • Framatome
181 • On-site Quantitative Nuclear Material Analysis for Fuel Debris by Portable 950 keV / 3.95 MeV X-ray / Neutron Sources in Fukushima • M. Uesaka, University of Tokyo
251 • Sensitivity Analysis of Corium Behavior and Properties of Concrete on Concrete Ablation during MCCI using MELCOR code

T07	• Reactor Physics & Analysis
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086 • MOX fuels to Reduce TRU nuclides in Light-water reactors • S. Wada • Toshiba Energy Systems & Solutions
179 • Correlation of Excess Reactivity with Uranium-235 Inventory in the Advanced Test Reactor • N. Manwaring • Idaho National Lab
293 • MCS Cycle Depletion Analysis and Validation of Excess Reactivity and Shutdown Margin for the Kartini Triga Mark II Research Reactor • V. Dos • UNIST
336 • An Innovative Method to Predict and Eliminate Xenon Oscillation - Backward Method • S. Alameri • Khalifa University of Science and Technology
389 • A MOX-fuel core configuration for the Westinghouse Lead Fast Reactor • F. Franceschini • Westinghouse Electric Company
406 • Development and Verification of the cosRMC-Oriented BREP-to-CSG Modeling Tool • Y. Yan • State Power Investment Corporation Research Institute

T08	• Thermal Hydraulics Analysis & Testing
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318 • Analysis of Small Modular Reactor Severe Accident Prevention and Mitigation Measures • S. Yin • Nuclear Power institute of China

T09	• Fuel Cycle & Waste Management
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061 • Study on Decontamination of Steel Surface Contaminated with Uranium Hexafluoride by Acidic Electrolytic Water • T. Nakayama • JAEA
227 • Introduction on Recently Revised Technical Standard for Incineration of Low and Intermediate Level Radioactive Waste in Korea • J. Lee • Korea Institute of Nuclear Safety