# Program at a Glance

## Program Overview

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<th>Time</th>
<th>Oct 17(Sun)</th>
<th>Oct 18(Mon)</th>
<th>Oct 19(Tue)</th>
<th>Oct 20(Wed)</th>
<th>Oct 21(Thu)</th>
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<tr>
<td>9:30-11:00</td>
<td>Registration (9:20~anytime)</td>
<td>Plenary (9:30~11:00)</td>
<td>Plenary (9:30~10:40)</td>
<td>Technical (9:30~11:40)</td>
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<td>11:00-11:10</td>
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<td>11:10-12:40</td>
<td>Registration (11:00~anytime)</td>
<td>Break (5min)</td>
<td>Plenary (11:25~12:40)</td>
<td>Technical (11:10~12:40)</td>
<td>Break (10min)</td>
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<td>12:40-14:10</td>
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<td>Lunch (90min)</td>
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<td>15:40-16:00</td>
<td>FLUKA Tutorial (14:10~17:30)</td>
<td>Poster</td>
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<td>16:00-17:30</td>
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<td>Technical (16:00~18:30)</td>
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<td>17:30-17:50</td>
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<td>Break (20min)</td>
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<td>Technical (16:00~18:30)</td>
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<tr>
<td>17:50-19:20</td>
<td>Welcome Reception (17:40~19:00)</td>
<td>Banquet (18:00~20:30)</td>
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* Technical Tour will be held on Friday, October 22.

## Program at a Glance

“Program at a Glance” is on the back cover.

## Session Index by Categories

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<td>Other Applications (Radiation Device, Fluid Dynamics, Earthquake Proof, Structural Analysis, Space &amp; Aviation)</td>
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<td>Monte Carlo Applications (Radiotherapy, Dosimetry, Device, Other)</td>
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<tr>
<td>Supercomputing in Nuclear Applications</td>
<td>PC</td>
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# Session Program

## 1: Oral Sessions

**October 18 (Mon) 10:20-11:20 Hitotsubashi Memorial Hall**

### Opening Plenary
Chair: Kazuo Todani (JAEA, Japan)

- **Opening Address**
  Atsuyuki Suzuki (President of Japan Atomic Energy Agency)

- **Welcome Address**
  Thierry Dujardin (OECD/NEA Deputy Director, Science and Development)

- **Congratulatory Address**
  Motoshi Shinozaki (Ministry of Education, Culture, Sports, Science and Technology)

- **Keynote Speech: Nuclear Research and Development Strategy in Japan**
  Shunsuke Kondo (Chairman of the Japan Atomic Energy Commission)

**October 18 (Mon) 11:25-12:40 Hitotsubashi Memorial Hall**

### P1: Supercomputer Advancement in Japan, EU, and US
Chairs: Yoshio Oyanagi (Kogakuin University, Japan), William Tang (Princeton University, USA)

- **Current Status on the Development of the K Computer**
  Mitsuo Yokokawa (RIKEN)

- **HPC trends in Europe: The PRACE project and the CEA program Recovering the capacity of designing and realizing large computer systems**
  Jean Gonnord (CEA)

- **Architecture for Data Intensive Computing**
  Eng Lim Goh (Silicon Graphics International)

**October 18 (Mon) 14:10-15:40 Hitotsubashi Memorial Hall**

### E1: Dosimetry I (Modeling of a Living Body)
Chairs: X. George Xu (Rensselaer Polytechnic Institute, USA), Kimiaki Saito (JAEA, Japan)

- **Comparison of Photon and Electron Absorbed Fractions in Voxel-Based and Simplified Phantoms for Small Animals**
  Akram Mohammadi (JAEA)

- **Construction of an Extended Library of Full Body Male Voxel Models: Rationale and Preliminary Results**
  David Broggio (Institut de Radioprotection et de Sûreté Nucléaire)

- **Construction of a Voxel Model from CT Images with Density Derived from CT Numbers**
  Mengyun Cheng (Chinese Academy of Sciences)

- **Simulation on Clustered DNA Damage Induction and Repair**
  Kimiaki Saito (JAEA)
### OA1: Quake-Proof Simulations and Modeling for Nuclear Facility I

**Chairs:** Norihiro Nakajima (JAEA, Japan), Takuya Yoshimura (Tokyo Metropolitan University, Japan)

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<th>Time</th>
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<tr>
<td>14:10-15:40</td>
<td>High Performance Multi-Scale and Multi-Physics Computation of Nuclear Power Plant Subjected to Strong Earthquake: An Overview</td>
<td>Conference Room 1</td>
<td>Shinobu Yoshimura (The University of Tokyo)</td>
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<tr>
<td></td>
<td>Seismic Response Analysis Using Three Dimensional FEM Analysis for BWR Nuclear Reactor Facilities</td>
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<td>Takehiro Oku (The Tokyo Electric Power Company)</td>
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<td></td>
<td>Comprehensive Numerical Analysis of Seismic Response of Nuclear Power Plant Building</td>
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<td>Muneo Hori (University of Tokyo)</td>
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<td></td>
<td>Structural Simulation and Modeling for Assembly in Real Space</td>
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<td>Norihiro Nakajima (JAEA)</td>
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<td></td>
<td>Input Force Identification by Apparent Mass Approach</td>
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<td>Takuya Yoshimura (Tokyo Metropolitan University)</td>
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### F1: Environment, Nuclear Accident

**Chairs:** Dušan Suchoň (ABmerit:nuclear science and software, Slovakia), Haruyasu Nagai (JAEA, Japan)

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<tr>
<th>Time</th>
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<th>Presenters</th>
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<tr>
<td>14:10-15:40</td>
<td>Parallel Computing for Radiological Impacts Assessment during Nuclear Accident</td>
<td>Conference Room 2</td>
<td>Dušan Suchoň (ABmerit:nuclear science and software)</td>
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<td></td>
<td>Development of Coupled Models for Regional Water Cycle and Material Transport in the Atmospheric, Terrestrial, and Oceanic Environment</td>
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<td>Haruyasu Nagai (JAEA)</td>
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<td></td>
<td>Development of Atmosphere-Soil-Vegetation Model for Investigation of Radioactive Materials Transport in Terrestrial Biosphere</td>
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<td>Genki Katata (JAEA)</td>
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<td>LES on Plume Dispersion within a Regular Array of Cubic Buildings</td>
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<td>Hiromasa Nakayama (JAEA)</td>
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<td>October 18 (Mon)</td>
<td>14:10-15:40</td>
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<tr>
<td><strong>OD1: Computer Modeling of Nuclear Materials I</strong></td>
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<td>Chairs: Naoto Sekimura (University of Tokyo, Japan), Fei Gao (PNNL, USA)</td>
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<tr>
<td>• Kinetic Monte Carlo Modeling of Radiation Effects in Fuels and Materials</td>
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<td>Brian D. Wirth (University of California)</td>
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<td>• Atomic Structure and Bonding Nature of Metal/Ceramics Interface: HRTEM, EELS and Ab-Initio Calculation</td>
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<td>Norihito Sakaguchi (Hokkaido University)</td>
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<td>• Chemical States of Fission Products and Actinides in Irradiated Oxide Fuels Analyzed by Thermodynamic Calculations and Post-Irradiation Examinations</td>
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<td>Kosuke Tanaka (JAEA)</td>
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<td>• Formation of Defect-Cluster Embryos in Nuclear Materials during Irradiation</td>
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<td>Kazunori Morishita (Kyoto University)</td>
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<td>• Numerical Study of Irradiation Damage Accumulation in BCC-Fe Using KMC Code with Elastic Interaction Between SIA Loops</td>
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<td>Kenichi Nakashima (CRIEPI)</td>
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<tr>
<th>October 18 (Mon)</th>
<th>16:00-18:30</th>
<th>Hitotsubashi Memorial Hall</th>
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<tr>
<td><strong>E2: Radiotherapy (Photon)</strong></td>
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<td>Chairs: Jan T.M. Jansen (Health Protection Agency, UK), Gui Li (Institute of Plasma Physics, China)</td>
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<td>• Photon Energy Spectrum Reconstruction Based on Monte Carlo and Measured Percentage Depth Dose in Accurate Radiotherapy</td>
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<td>Gui Li (Chinese Academy of Sciences)</td>
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<td>• Implementation of Multileaf Collimator in a LINAC MCNP5 Simulation Coupled with the Radiation Treatment Planning System PLUNC</td>
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<td>Rafael Miró (Universitat Politècnica de València)</td>
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<tr>
<td>• Comparison of MCNP5 Dose Calculations inside the Rando Phantom Irradiated with a Linac 5 X 5 Photon Beam against Treatment Planning System PLUNC</td>
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<td>Rafael Miró (Universitat Politècnica de València)</td>
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<tr>
<td>• GEANT4 Simulation to Study the Sensitivity of a MICRON Silicon Strip Detector Irradiated by a SIEMENS PRIMUS Linac</td>
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<td>Miguel A. Cortés-Giraldo (University of Sevilla)</td>
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<td>• Dose Distribution Calculation of Space Coherent X-Ray Therapy</td>
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<td>Hiroshi Iwase (KEK)</td>
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### OA2: Quake-Proof Simulations and Modeling for Nuclear Facility II-A
Chairs: Tsuyoshi Ichimura (University of Tokyo, Japan), Hiroshi Akiba (Allied Engineering Corporation, Japan)

- **Fast Computational Scheme for Large Scale Temperature Dependent Transient Nonlinear Problems in Welding Mechanics**
  Hidekazu Murakawa (Osaka University)
- **Applicability of Finite Element Method to Collapse Analysis of Steel Connection under Compression**
  Zhiguang Zhou (JAEA)
- **Numerical Analysis of Failure Behavior of Reinforced Concrete Pier Using PDS-FEM**
  Kenji Oguni (Keio University)
- **Seismic Structural Response Analysis Considering Fault-Structure System – Application to Nuclear Power Plant Structures –**
  Pher Errol Quinay (Tokyo Institute of Technology)
- **Large Scale Parallel Structural Analysis System and its Application to Seismic Analysis of BWR**
  Hiroshi Akiba (Allied Engineering Corporation)
- **Numerical Simulation for Seismic and Volcanic Phenomena**
  Eisuke Fujita (National Res. Inst. for Earth sci. and Disast. prev.)

### C1: Reactor Analysis
Chairs: Toru Obara (Tokyo Institute of Technology, Japan), Wolfgang Bernnat (Universität Stuttgart, Germany)

- **Improvement of Neutronics Calculation Methods for Fast Reactors**
  Toshikazu Takeda (University of Fukui)
- **A Deterministic-Monte Carlo Hybrid Method for Time-Dependent Neutron Transport Problems**
  Justin M. Pounders (Georgia Institute of Technology)
- **Kinetic Analysis of Weakly Coupled Systems Using Probability Density Function of Coupling Coefficient Obtained by Monte Carlo Method**
  Toru Obara (Tokyo Institute of Technology)
- **Commercial BWR Whole Core Calculations with MCNP5**
  Sho Takano (Global Nuclear Fuel - Japan)
- **Monte Carlo Applications with Consideration of Detailed Material Composition and Temperature Distributions in LWR and HTR**
  Wolfgang Bernnat (University of Stuttgart)
- **Evaluation of the Statistical Error in the Results of Calculations of Full-Scale Three-Dimensional Model of VVER-1000 by Means of the Monte Carlo Method**
  Dmitry S. Oleynik (Kurchatov Institute)
- **Methodology and Visualization of Monte Carlo Calculation for Displacements Per Atom in Light Water Reactors**
  Edward A. Read (University of New Mexico)
### October 18 (Mon) 16:00-18:30 Conference Room 3

**H1: Methods of Monte Carlo Eigenvalue Calculation I**

**Chairs:** Taro Ueki (Japan), David P. Griesheimer (Bechtel Marine Propulsion Corporation, USA)

- **K-Effective of the World and Other Concerns for Monte Carlo Eigenvalue Calculations**  
  Forrest Brown (LANL)
- **Spectral Analysis of Stochastic Noise in Fission Source Distributions from Monte Carlo Eigenvalue Calculations**  
  David P. Griesheimer (Bettis Atomic Power Laboratory)
- **Convergence Diagnostics of Monte Carlo Eigenvalue Simulations Using Differential Information**  
  Bojan Petrovic (Georgia Institute of Technology)
- **Introduction of New Information Entropy for Source Convergence Diagnostics in Monte Carlo Criticality Calculation**  
  Yoshitaka Naito (NAIS co.inc.)
- **A Decorrelation Technique for Iterated Source Monte Carlo Calculations**  
  Brian R Nease (CEA)
- **On-The-Fly Monte Carlo Dominance Ratio Calculation Using the Noise Propagation Matrix**  
  Thomas M. Sutton (Bechtel Marine Propulsion Corp.)
- **Unbiased-Variance Estimation by Grouping Histories in Monte Carlo Eigenvalue Calculations**  
  Hyungjin Shim (Seoul National University)
- **A Fission Matrix Based Methodology for Achieving an Unbiased Solution for Eigenvalue Monte Carlo Simulations**  
  Alireza Haghighat (University of Florida)

### October 18 (Mon) 16:00-18:30 Conference Room 4

**J1: Monte Carlo Code Development I (Hadron)**

**Chairs:** Stefan Roesler (CERN, Switzerland), Yosuke Iwamoto (JAEA, Japan)

- **Validation of Geant4 Hadronic Generators Versus Thin Target Data**  
  Sunanda Banerjee (Fermilab)
- **Development of the Fritiof Model in Geant4**  
  Vladimir Uzhinsky (CERN)
- **The Geant4 Toolkit: Evolution and Status**  
  John Apostolakis (CERN)
- **Comparison of Monte Carlo Simulation Codes for Heavy Ion Transport**  
  Cheol Woo Lee (Korea Atomic Energy Research Institute)
- **New Features of the Particle and Heavy Ion Transport Code System**  
  Koji Niita (Research Organization for Information Science & Technology)
- **Benchmarking of PHITS on Activation for High-Energy Proton Accelerator Facility**  
  Norihiro Matsuda (JAEA)
- **New Native QMD Code in Geant4**  
  Tatsumi Koi (SLAC National Accelerator Laboratory)
### G1: High Performance Computing (Grid Computing and Cluster Computing)

**Chairs:** Hiroshi Takemiya (JAEA, Japan), James Tickner (CSIRO, Australia)

- **A Portable Grid-Enabled Computing System for A Nuclear Material Study**  
  Yuichi Tsujita (Kinki University)
- **On-The-Fly Computing on Many-Core Processors in Nuclear Applications**  
  Noriyuki Kushida (JAEA)
- **Virtual Machine Scheduling for Special Purpose Clusters**  
  Stefan Boettger (Kirchhoff Institute for Physics, Heidelberg)
- **Fault-Tolerant Mechanism of Both Job Execution and File Transfer for Integrated Nuclear Energy Simulation**  
  Takayuki Tatekawa (JAEA)
  Yoshio Suzuki (JAEA)
- **Experience Feedback in Software Development Using the X10 Language**  
  Marc Tajchman (CEA)

### OB1: Multi-Phase Flow Simulation

**Chairs:** Feng Xiao (Tokyo Institute of Technology, Japan), Kei Ito (JAEA, Japan)

- **Verification of Detailed Two-Phase Flow Simulation Code TPFIT to Water Jet Experiment**  
  Hiroyuki Yoshida (JAEA)
- **Numerical Investigation on Violent Sloshing in Closed Tanks**  
  Takehiro Himeno (The University of Tokyo)
- **Numerical Study on Subcooled Pool Boiling**  
  Yasuo Ose (Kyoto University)
- **Nano-Particle Behavior Due to Thermophoretic Force in Rarefied Gas Flow in Transition Region**  
  Takehiko Yokomine (Kyushu University)
- **A Simplified Interface Capturing Scheme Using a Continuous Function**  
  Satoshi Ii (The University of Tokyo)
- **Large Scale Simulations of Interfacial Multi-Fluid Flows**  
  Feng Xiao (Tokyo Institute of Technology)
- **Direct Numerical Simulation of Turbulent Channel Flow with Deformed Bubbles**  
  Yoshinobu Yamamoto (Kyoto University)
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<td><strong>P2: Advanced Supercomputing in Nuclear Application</strong>&lt;br&gt;Chairs: Brian D. Wirth (University of Tennessee, USA), Tomoaki Kunugi (Kyoto University, Japan)</td>
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<tr>
<td>• Particle Simulation for Fluid Dynamics with Free Surfaces&lt;br&gt;Seiichi Koshizuka (University of Tokyo)</td>
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<td>• Stochastic methods for simulations of irradiated materials&lt;br&gt;Vasily Bulatov (LLNL)</td>
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<td>• Scientific Grand Challenges in Fusion Energy Sciences and the Role of Computing at the Extreme Scale&lt;br&gt;William Tang (Princeton University)</td>
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<td>October 19 (Tue)</td>
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<td><strong>OD2: Computer Modeling of Nuclear Materials II</strong>&lt;br&gt;Chairs: Kazunori Morishita (Kyoto University, Japan), Brian D. Wirth (University of Tennessee, USA)</td>
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<tr>
<td>• Multi Scale Modeling of Helium Effects in Iron&lt;br&gt;Fei Gao (Pacific Northwest National Laboratory)</td>
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<td>• First-Principles Modeling of Defective Structures in Nonstoichiometric Ceramic Fuels&lt;br&gt;Ying Chen (Tohoku University)</td>
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<td>• First-Principle Calculations of Hydrogen Interaction with Vacancies and Dissolved Atoms in Tungsten&lt;br&gt;Daiji Kato (National Institute for Fusion Science)</td>
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<td>• Development of a Potential Model for W-H Systems&lt;br&gt;Takuji Oda (The University of Tokyo)</td>
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<td>• First-Principles Study of the Grain-Boundary Embrittlement of Metals&lt;br&gt;Masatake Yamaguchi (JAEA)</td>
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<tr>
<td>October 19 (Tue)</td>
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<td><strong>OB2: Computational Fluid Dynamics in Nuclear Power System</strong>&lt;br&gt;Chairs: Kazuyuki Takase (JAEA, Japan), Hiroyuki Yoshida (JAEA, Japan)</td>
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<td>• Numerical Simulation of Boiling Two-Phase Flow in a Simulated Subchannel of Fuel Assemblies Excited by Earthquake Oscillation&lt;br&gt;Takeharu Misawa (JAEA)</td>
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<td>• Development of Numerical Simulation Code for Thermal Striping Phenomena in Japan Sodium Cooled Fast Reactor&lt;br&gt;Masaaki Tanaka (JAEA)</td>
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<td>• Two-Phase Flow Simulation of Gas Entrainment Phenomena in Large-Scale Fast Reactor&lt;br&gt;Kei Itō (JAEA)</td>
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<td>• Development of a Sodium-Water Reaction Model for Sodium-Cooled Fast Reactors Using a CFD Code&lt;br&gt;Kazuo Haga (JNES)</td>
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<tr>
<td>• Numerical Analysis on Thermal-Hydraulics of Supercritical Water Flowing in a Tight-Lattice Fuel Bundle&lt;br&gt;Toru Nakatsuka (JAEA)</td>
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</table>
### G2: Information Technology and its Applications I

#### Chairs:
Toshiyuki Imamura (The University of Electro-Communications, Japan), Christian Theis (CERN, Switzerland)

- Application Integration Control System for Multi-Scale and Multi-Physics Simulation
  Chiaki Kino (JAEA)
- Spatio-Temporal Mapping - A Technique for Overview Visualization of Time-Series Dataset-
  Hiroko Nakamura Miyamura (JAEA)
- SALOME: A Software Integration Platform for Multi-Physics, Pre-Processing and Visualization
  Vincent Bergeaud (CEA/DEN)

#### October 19 (Tue) 11:10-12:40  Conference Room 2

### H2: Methods of Monte Carlo Eigenvalue Calculation II

#### Chairs:
Forrest B. Brown (LANL, USA), Bojan Petrovic (Georgia Institute of Technology, USA)

- Autoregressive Moving Average Fitting for Real Standard Deviation in Monte Carlo Power Distribution Calculation
  Taro Ueki (Research Organization for Information Science & Technology)
- Particle Population for Power Distribution Calculation by Monte Carlo Method
  Taro Ueki (University of New Mexico)
- Efficiency Improvement of Local Power Estimation in the General Purpose Monte Carlo Code MCNP
  J. Eduard Hoogenboom (Delft University of Technology)
- Multigroup Monte Carlo Reactor Calculation with Coarse Mesh Finite Difference Formulation for Real Variance Reduction
  Min-jae Lee (Seoul National University)

#### October 19 (Tue) 11:10-12:40  Conference Room 3

### A1: Multiscale Materials Modeling I

#### Chairs:
Mitsuhiro Itakura (JAEA, Japan), Ken-Ichi Ebihara (JAEA, Japan)

- Atomistic Simulations of Stress Concentration and Dislocation Nucleation at Grain Boundaries
  Tomohito Tsuru (JAEA)
- Development of EAM Potential for Impurity Atoms in BCC Iron Based on Quantum Calculations
  Mitsuhiro Itakura (JAEA)
- Evaluation of Local Stress and Local Hydrogen Concentration at Grain Boundary Using Three-Dimensional Polycrystalline Model
  Ken-ichi Ebihara (JAEA)

#### October 19 (Tue) 11:10-12:40  Conference Room 4
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<td>Conference Room 101</td>
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**F2: Monte Carlo Applications I (Biology)**

Chairs: X. George Xu (Rensselaer Polytechnic Institute, USA), Tatsuhiko Sato (JAEA, Japan)

- New Hybrid Monte Carlo Methods for Efficient Sampling: from Physics to Biology and Statistics  
  Elena Akhmatskaya (Fujitsu Laboratories of Europe)
- Modeling Radiation Chemistry and Biology in the Geant4 Toolkit  
  Alfonso Mantero (INFN Sezione di Genova)
- Monte-Carlo Simulation and Microdosimetry Analysis of an A-Particle Source for Cell Irradiation  
  Ana Belchior (Instituto tecnológico e Nuclear)
- Fluence-To-Dose Conversion Coefficients for Muons and Pions Calculated Based on ICRP Publication 103 Using the PHITS Code  
  Tatsuhiko Sato (JAEA)

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**H3: Physics Modeling by Monte Carlo Technique**

Chairs: Jean-Christophe David (CEA, France), Toshihiko Kawano (LANL, USA)

- Monte Carlo Simulation of Neutron Evaporation by Fragments in Low Energy Nuclear Fission  
  Djelloul Benzaid (University Centre of Khemis Miliana)
- Particle-Gamma and Particle-Particle Correlations in Nuclear Reactions Using Monte Carlo Hauser-Feshbach Model  
  Toshihiko Kawano (Los Alamos National Laboratory)
- Spallation Fragments in the Cascade Stage  
  Hiroki Iwamoto (JAEA)

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**OB3: High Performance Simulation in Weather/Climate Forecasting I**

Chairs: Feng Xiao (Tokyo Institute of Technology, Japan), Shinichiro Kida (JAMSTEC, Japan)

- Seamless Simulations for Forecasting of Weather/climate and High Performance Computing  
  Keiko Takahashi (Earth Simulator Center, JAMSTEC)
- High-Performance Computing for Multiphase Phenomena in Cloud Turbulence  
  Ryo Onishi (Earth Simulator Center, JAMSTEC)
- High Resolution Large-Eddy Simulation of Urban Scale Atmospheric Flows in Convective Boundary Layer  
  Yuya Baba (Earth Simulator Center, JAMSTEC)
- High-Accuracy Wave Simulation for the Prediction of Extreme Waves  
  Hitoshi Tamura (Research Institute for Global Change, JAMSTEC)
- Oil-Spill Simulation Using Global Atmosphere-Ocean Model  
  Young Jin Choi (Kobe University)
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<tr>
<td><strong>G3: Information Technology and its Applications II</strong>&lt;br&gt;Chairs: Ken Naono (Hitachi, Ltd., Japan), Marc Tajchman (CEA, France)</td>
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<tr>
<td>• The Impact of Monte Carlo Simulation: A Scientometric Analysis of Scholarly Literature&lt;br&gt;Maria Grazia Pia (INFN Genova)</td>
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<td>• SimpleGeo – New Developments in the Interactive Creation and Debugging of Geometries for Monte Carlo Simulations&lt;br&gt;Christian Theis (CERN)</td>
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<td>• Physics Data Management Tools: Computational Evolutions and Benchmarks&lt;br&gt;Mincheol Han (Hanyang University)</td>
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<tr>
<td><strong>H4: Monte Carlo Code Development I</strong>&lt;br&gt;Chairs: Takamasa Mori (JAEA, Japan), LEE Yi-Kang (CEA, France)</td>
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<td>• SCALE Monte Carlo Eigenvalue Methods and New Advancements&lt;br&gt;Sedat Goluoglu (ORNL)</td>
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<td>• Advances in Sensitivity Analysis Capabilities with SCALE 6.0&lt;br&gt;Bradley T. Rearden (ORNL)</td>
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<td>• Use of the Serpent Monte Carlo Reactor Physics Code for Full-Core Calculations&lt;br&gt;Jaakko Leppänen (VTT Technical Research Centre of Finland)</td>
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<td>• Hybrid and Parallel Domain-Decomposition Methods Development to Enable Monte Carlo for Reactor Analyses&lt;br&gt;John C. Wagner (ORNL)</td>
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<td><strong>E3: Radiotherapy (Algorithm and Software)</strong>&lt;br&gt;Chairs: Takashi Sasaki (KEK, Japan), Pedro Arce (CIEMAT, Spain)</td>
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<td>• Epistemic and Systematic Uncertainties in Monte Carlo Simulation: an Investigation in Proton Bragg Peak Simulation&lt;br&gt;Maria Grazia Pia (INFN Genova)</td>
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<td>• GAMOS: An Easy and Flexible Way to Use Geant4&lt;br&gt;Pedro Arce (CIEMAT)</td>
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<td>• Patient-Specific Multi-Scale Monte Carlo Simulations for Radiation Therapy: from Macroscopic Radiation Transport to DNA Damage&lt;br&gt;Joseph J Lucido (University of British Columbia)</td>
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<td>• A Brachytherapy Treatment Planning System Based on Dicom Images and MCNP5 Calculations Optimized with Artificial Neural Network&lt;br&gt;Amir R. Moghadam (Shiraz University)</td>
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## October 19 (Tue) 16:00-17:30 Conference Room 1

**OB4: High Performance Simulation in Weather/Climate Forecasting II**  
Chairs: Keiko Takahashi (JAMSTC, Japan), Ryo Onishi (JAMSTC, Japan)

- Turbulent Mass Transport Over Wind-Waves by Parallel Numerical Simulations  
  Feng Xiao (Tokyo Institute of Technology)
- Development of Non-Splitting Semi-Lagrangian Scheme for Fully Compressible Flow on Global Soroban Grid  
  Takeshi Sugimura (Earth Simulator Center, JAMSTEC)
- The Impact of Coastal Currents On Dense Gravity Currents Around Antarctica  
  Shinichiro Kida (Earth Simulator Center, JAMSTEC)

## October 19 (Tue) 16:00-17:30 Conference Room 2

**G4: High Performance Numerical Algorithms and Solvers**  
Chairs: Tomonori Yamada (JAEA, Japan), Serge Van Criekinger (Karlsruhe Institute of Technology, Germany)

- Performance Evaluation of the Gram-Schmidt Orthogonalization with Numerical Policy Interface on Heterogeneous Platforms  
  Ken Naono (Hitachi, Ltd.)
- Development of a High Performance Eigensolver on the Peta-Scale Next Generation Supercomputer System  
  Toshiyuki Imamura (University of Electro-Communications)
- Novel Approach in a Divide and Conquer Algorithm for Eigenvalue Problems of Real Symmetric Band Matrices  
  Pham Huu Phuong (University of Electro-Communications)
- Rapid Scheme of Producing Generalized Fourier Expansion of Matrix Function and its Application to Physical Problems  
  Masaki Itoh (Shimane University)

## October 19 (Tue) 16:00-17:30 Conference Room 3

**H5: Monte Carlo Code Development II**  
Chairs: John C. Wagner (ORNL, USA), Jaakko Leppänen (VTT Technical Research Centre of Finland, Finland)

- Monte Carlo Code PRIZMA for Calculation of Particle Transport Problems  
  Oleg V. Zatsepin (Russian Federal Nuclear Center)
- Uncertainties Propagation in Monte Carlo Burnup Codes. Implementation in TRIPOLI-4-D  
  Eric Dumonteil (SERMA, CEA)
- Performance Assessment and Improvement of Direct Accelerated Geometry Monte Carlo (DAGMC)  
  Paul P.H. Wilson (University of Wisconsin-Madison)
- Progress and Applications of MCAM: Monte Carlo Automatic Modeling Program for Particle Transport Simulation  
  Guozhong Wang (Chinese Academy of Sciences)
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<th>October 19 (Tue)</th>
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<tr>
<td><strong>C2: Shielding (Fusion)</strong></td>
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<td>Chairs: Mitsufumi Asami (National Maritime Research Institute, Japan), Paul P.H. Wilson (University of Wisconsin-Madison, USA)</td>
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<tr>
<td>• High Performance Parallel Monte Carlo Transport Computations for ITER Fusion Neutronics Applications&lt;br&gt;Arkady Serikov (Karlsruhe Institute of Technology)</td>
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<td>• A Novel Method to Carry out Uncertainty Analyses for ITER Shielding Calculations: a Useful Tool in the Engineering and Design Phase&lt;br&gt;Alfred Hogenbirk (NRG)</td>
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<td>• Conceptual Radiation Shielding Design of Superconducting Tokamak Fusion Device by PHITS&lt;br&gt;Atsuhiko M. Sukegawa (JAEA)</td>
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<td>• Important Remarks on Latest Multigroup Libraries&lt;br&gt;Chikara Konno (JAEA)</td>
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<tr>
<td><strong>F3: Monte Carlo Applications II (Device Damage)</strong></td>
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<td>Chairs: Dennis H. Wright (SLAC, USA), Markus Brugger (CERN, Switzerland)</td>
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<td>• R&amp;D Project for a Geant4-Based, Multi-Scale Simulation Environment to Study the Radiation Effects on Electronic Devices&lt;br&gt;Julien Mekki (University of Montpellier)</td>
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<td>• GEANT4 Microdosimetry Study of Ionizing Radiation Effects in Digital ASIC's&lt;br&gt;Miguel A. Cortés-Giraldo (University of Sevilla)</td>
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<td>• Fluka Capabilities and Applications for Radiation Damage to Electronics at High-Energy Hadron Accelerators&lt;br&gt;Markus Brugger (CERN)</td>
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<td>• Calculation for 1-MeV Equivalent Factor of Neutrons with Different Spectrums&lt;br&gt;Huang Linxing (Northwest Institution of Nuclear Technology)</td>
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<tr>
<td><strong>D1: Nuclear Fuel, Nuclear Fuel Cycle, Repository Performance</strong></td>
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<td>Chairs: Ying Chen (Tohoku University, Japan), Kenji Konashi (Tohoku University, Japan)</td>
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<td>• Numerical Tools for the Evaluation of Super-Compacted Radioactive Waste Residues&lt;br&gt;Stephan Schneider (Forschungszentrum Juelich GmbH)</td>
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<td>• Development of Homogeneous Filling Method of Particulate Materials Into Compression Mold for Nuclear Fuel Process&lt;br&gt;Sadato Makino (Doshisha University)</td>
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<td>• Relativistic Ab Initio Calculations for Nuclear Volume Effects in Isotope Separations&lt;br&gt;Minori Abe (Tokyo Metropolitan University)</td>
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### October 20 (Wed) 9:30-10:40  
**Hitotsubashi Memorial Hall**

#### P3: Advances in Monte Carlo Methodologies
Chairs: J. Eduard Hoogenboom (Delft University of Technology, Netherlands),

- Recent Advances and Future Prospects for Monte Carlo  
  Forrest B. Brown (LANL)
- 3D/4D Human Modeling and Monte Carlo Dose Calculation for Radiation Protection, Imaging and Radiotherapy  
  X. George Xu (Rensselaer Polytechnic Institute)

### October 20 (Wed) 10:50-12:40  
**Hitotsubashi Memorial Hall**

#### E4: Radiotherapy (Brachytherapy and Boron Neutron Capture Therapy)
Chairs: David Broggio (IRSN, France), Hiroaki Kumada (University of Tsukuba, Japan)

- Background Dose for Systemic Targeted Alpha Therapy  
  Chen-Yu Huang (St. George Clinical School, University of New South Wales)
- Development of a Monte-Carlo Based Treatment Planning System for BNCT and Charge Particle Radiotherapy  
  Hiroaki Kumada (University of Tsukuba)
- Design of Moderator and Multiplier Systems for D-T Neutron Source in the BNCT Using MCNP4C Code  
  Farshad Mostafaei (University of Shiraz)

### October 20 (Wed) 10:50-12:40  
**Conference Room 1**

#### A2: Multiscale Materials Modeling II
Chairs: Hideo Kaburaki (JAEA, Japan), Tomoaki Suzudo (JAEA, Japan)

- LDA+U Study on Plutonium Dioxide with Spin-Orbit Couplings  
  Hiroki Nakamura (JAEA)
- Kinetic Monte Carlo Annealing Simulation of Cascade Damage in alpha-Fe  
  Tomoaki Suzudo (JAEA)
- Density Matrix Renormalization Group and Numerical Diagonalization Study on the Quantum Spin Nanotube in Magnetic Field  
  Toru Sakai (JAEA)
- Evaluation of Solute-Atom Clusters Segregated in alpha-Fe  
  Chikashi Suzuki (JAEA)
- Effect of Spin-Orbit Coupling in Strongly Correlated Compounds  
  Hiroaki Onishi (JAEA)
### October 20 (Wed) 10:50-12:40  Conference Room 2

**C3: Detector Response and Activation Analysis**

Chairs: Ben F. Volmert (Nagra, Switzerland), Gaëtan Girardin (École Polytechnique Fédérale de Lausanne, Switzerland)

- **MCNP/TORT Coupling vs. MCNP Biasing Transport Methods for PWR Applications**  
  Christos Trakas (AREVA NP, Paris)

- **NPP Activation Inventory Calculations for the Swiss Decommissioning Study Using MCNP5 and GRSAKTIV-II**  
  Ben F. Volmert (Nagra)

- **Validation of the Monte Carlo Model Developed to Estimate the Neutron Activation of Stainless Steel in a Nuclear Reactor**  
  José Ródenas (Universitat Politècnica de València)

- **Modeling of a Double Fission Chamber Using MCNPX for Power Calibration at the Zero-Power Teaching Reactor CROCUS**  
  Gaëtan Girardin (EPFL)

- **Monte-Carlo Based Numerical Modeling and Simulation of Criticality Conditions Occurrence in Natural Reactor Zone 9 in Oklo Deposit (Gabon)**  
  Salah-Eddine Bentridi (University of Strasbourg)

### October 20 (Wed) 10:50-12:40  Conference Room 3

**H6: Monte Carlo Code Verification/Validation**

Chairs: Sedat Goluoglu (ORNL, USA), François-Xavier Hugot (CEA, France)

- **MCNP Performance Evaluation for the NEA 3D PWR Benchmark**  
  Bojan Petrovic (Georgia Institute of Technology)

- **A Highly Simplified 3D BWR Benchmark Problem**  
  Steven Douglass (Georgia Institute of Technology)

- **Comparison Between Calculations and Experiments for an SCWR-Like Fuel Lattice with Perturbed Moderator Regions**  
  Kelly Jordan (Paul Scherrer Institute)

- **Modern Calculations of Pulsed-Sphere Time-Of-Flight Experiments Using the Mercury Monte Carlo Transport Code**  
  Richard J. Procassini (LLNL)

- **Application of Dose Evaluation of the MCNP Code for the Spent Fuel Transport Cask**  
  Mitsufumi Asami (National Maritime Research Institute)
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<tr>
<td><strong>I1: New Techniques and Applications of Photon-Electron</strong></td>
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<td>Chairs: Maria Grazia Pia (INFN, Italy), Kazuaki Kosako (Shimizu corporation, Japan)</td>
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<tr>
<td>• Environmental Adaptability and Mutants: Exploring New Concepts in Particle Transport for Multi-Scale Simulation</td>
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<td>Maria Grazia Pia (INFN Genova)</td>
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<td>• New Techniques in Monte Carlo Simulation: Experience with a Prototype of Generic Programming Application to Geant4 Physics Processes</td>
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<td>Marcia Begalli (INFN Genova)</td>
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<td>• Micro-Scale Dose Distribution of Microbeam X Rays: Measurement and MC Calculation</td>
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<td>Nobuteru Nariyama (Japan Synchrotron Radiation Research Institute)</td>
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<td>• Flux-Probability Distributions for Radiation Transport in Binary Stochastic Media</td>
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<td>Brian C. Franke (SNL)</td>
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<tr>
<td><strong>OC1: Maintenance Engineering Simulation I</strong></td>
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<td>Chairs: Fumio Inada (Central Research Institute of Electric Power Industry, Japan), Ovidiu Mihalache (JAEA, Japan)</td>
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<td>• Investigating the Characteristics of FAC Sites Using CFD Methodology (Invited)</td>
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<td>Yuh-Ming Ferng (Tsinghua University)</td>
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<td>• CFD Application for Piping Wall Thinning and Fatigue Due to Acoustic Vibration</td>
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<td>Ryo Morita (CRIEPI)</td>
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<td>• Integrated Super Computational Prediction of Liquid Droplet Impingement Erosion</td>
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<td>Jun Ishimoto (Tohoku University)</td>
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<td>• Turbulent Swirl Flow in a Pipe with an Orifice</td>
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<td>Haruo Terasaka (University of Aizu)</td>
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<td>• Modeling of 3D SCC Crack Growth with SGBEM-FEM Alternating Method</td>
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<td>Gennadiy Nikishkov (University of Aizu)</td>
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<tr>
<td><strong>OE1: Nuclear Fusion Simulation I</strong></td>
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<tr>
<td>Chairs: Shinichi Satake (Tokyo University of Science, Japan), Tomoaki Kunugi (Kyoto University, Japan)</td>
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<tr>
<td>• Direct Numerical Simulation of MHD Turbulent Flows with High-Pr Heat Transfer</td>
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<td>Yoshinobu Yamamoto (Kyoto University)</td>
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<tr>
<td>• The Effect of MHD on Heat and Mass Transfer in Turbulent Duct Flow</td>
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<td>Takehiko Yokomine (Kyushu University)</td>
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<tr>
<td>• DNS of MHD Turbulent Flow with Buoyancy</td>
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<td>Keito Furumi (Tokyo University of Science)</td>
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<td>• Numerical Simulation of Turbulent Flow of Coolant in a Test Blanket Module of Nuclear Fusion Reactor</td>
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<td>Yohji Seki (JAEA)</td>
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### E5: Radiotherapy (Proton)

Chairs: Pablo G.A. Cirrone (INFN, Italy), Hiroshi Iwase (KEK, Japan)

- Hadrontherapy: a Geant4-Based Tool for Proton/ion-Therapy Studies  
  Pablo G.A. Cirrone (LNS-INFN, Catania)
- PTSim and TOPAS, Geant4 in the Particle Therapy Clinic  
  Tsukasa Aso (Toyama National College of Technology)
- Domain-Division Monte Carlo Dose Calculation Method for Particle Therapy  
  Kenichi L. Ishikawa (University of Tokyo)
- Monte Carlo Modeling of Respiration-Related Proton Range Fluctuation Using a Time-Resolved Proton Range Telescope for Proton Treatment  
  X. George Xu (Rensselaer Polytechnic Institute)

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### C4: Monte Carlo Burnup

Chairs: Keisuke Okumura (JAEA, Japan), Christos Trakas (AREVA NP, France)

- Transmutation Efficiency in the Prismatic Deep Burner HTR Concept by a 3D Monte Carlo Depletion Analysis  
  Christos Trakas (AREVA NP, Paris)
- Burnup Analysis of a Peu à Peu Fuel-Loading Scheme in a Pebble Bed Reactor Using the Monte Carlo Method  
  Dwi Irwanto (Tokyo Institute of Technology)
- Post Irradiation Examination Analyses with a Continuous-Energy Monte Carlo Code MVP for Long-Lived Fission Products in LWR Spent Fuels  
  Keisuke Okumura (JAEA)
- Calculation of Pellet Radial Power Distributions with a Monte Carlo Burnup Code  
  Motomu Suzuki (JNES)

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### H7: New Techniques in Monte Carlo Calculation I

Chairs: Bradley T. Rearden (ORNL, USA), Thomas M. Sutton (KAPL, USA)

- Monte Carlo Simulation of Fully Markovian Stochastic Geometries  
  Alain Mazzolo (CEA de Saclay)
- MCNP Super Lattice Method for VHTR ORIGEN2.2 Nuclear Library Improvement Based on ENDF/B-VII  
  Gray S. Chang (Idaho National Laboratory)
- A Monte Carlo Method for Calculation on the Dynamic Behaviour of Nuclear Reactors  
  Bart L. Sjenitzer (Delft University of Technology)
- Implementation of Photonuclear Reactions in the Monte Carlo Transport Code TRIPOLI-4 and its First Validation in Waste Package Field  
  Odile Petit (CEA)

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</table>
### October 20 (Wed) 14:10-15:40  Conference Room 4

#### F4: Monte Carlo Applications III (Others)

Chairs: Pedro Vaz (Nuclear and Technological Institute, Portugal),
Teemu Siiskonen (STUK-Radiation and Nuclear Safety Authority, Finland)

- Evaluation of the Effects of Gamma Irradiation from a $^9$Be Neutron Source in Digital ASIC's with GEANT4
  Miguel A. Cortés-Giraldo (University of Sevilla)
- Application of the Tikhonov Unfolding Method for Reconstruction of Primary X-Ray Spectra of X-Ray Equipments with Germanium Detector
  José Ródenas (Universitat Politècnica de València)
- Radioactive Decay Simulation with Geant4: Experimental Benchmarks and Developments for X-Ray Astronomy Applications
  Steffen Hauf (INFN Genova)
- New Approach to Spectrum Analysis – Iterative Monte Carlo Simulations and Fitting
  Teemu Siiskonen (STUK - Radiation and Nuclear Safety Authority)

### October 20 (Wed) 16:00-18:30  Hitotsubashi Memorial Hall

#### C5: Dosimetry II (Facility, Detector)

Chairs: Hesham Y. Khater (LLNL, USA), Mario Santana Leitner (SLAC, USA)

- Characterization of the WENDI-II REM Counter for its Application at MedAustron
  Lukas Jägerhofer (CERN)
- Monte Carlo Simulation of the Prompt Dose Environment in the National Ignition Facility during Low Yield D-T Shots
  Hesham Y. Khater (LLNL)
- Monte Carlo Studies of the Radiation Fields in the Linac Coherent Light Source Undulators and of the Corresponding Signals in the Cherenkov Beam Loss Monitors
  Mario Santana Leitner (SLAC National Accelerator Laboratory)
- Efficient Calculations of in Vivo Efficiency Curves
  Jad Farah (L’Institut de Radioprotection et de Sûreté Nucléaire)
- Calibration of a Broad Energy Germanium Detection System Using Monte Carlo Simulations
  Pedro Teles (Instituto tecnológico e Nuclear)
### G5: High Performance Computing in Monte Carlo Simulation

**Chairs:** Masatoshi Yagi (Kyushu University/JAEA, Japan), Tanguy Courau (EDF, France)

- **New Parallel Computing Framework for Radiation Transport Codes**
  Mikhail A. Kostin (Michigan State University)

- **Towards Scalable Parallelism in Monte Carlo Particle Transport Codes Using Remote Memory Access**
  Paul Romano (MIT)

- **Massively Parallel Monte Carlo**
  James Tickner (CSIRO Process Science and Engineering)

- **Real-Time Particle Transport Simulation on a Large Graphics-Processing Unit Cluster**
  James Tickner (CSIRO Process Science and Engineering)

- **A Fast and Precise Dose Calculation Algorithm on a GPU Architecture**
  Pablo Yepes (Rice University)

- **Random Number Generators Tested on Quantum Monte Carlo Simulations**
  Ryo Maezono (JAIST)

- **Randomness and Genuine Random Number Generator with Self-Testing Functions**
  Isao Tatsuno (LE Tech Co., Ltd.)

### B1: Nuclear Plant Analysis and Thermal Hydraulics

**Chairs:** Akira Yamaguchi (Osaka University, Japan), Tadashi Watanabe (JAEA, Japan)

- **Neutron-Coupled Thermal Hydraulic Calculation of BWR under Seismic Acceleration**
  Akira Satou (JAEA)

- **Numerical Simulation of Thermal Stratification in Cold Legs by Using OpenFOAM**
  Jiejin Cai (JAEA)

- **Numerical Analysis of Free-Surface Flows by Using OpenFOAM**
  Ken Uzawa (JAEA)

- **BWR Instability Analysis with the Coupled Codes Relap5/Parcs V2.7 in Ringhals NPP**
  Rafael Miró (Universitat Politècnica de València)

- **Development of Integrated Core Disruptive Accident Analysis Code for FBR – ASTERIA-FBR**
  Tomoko Ishizu (JNES)

- **Implementation of Transient Neutron Transport Solver in ASTERIA-FBR**
  Toshihisa Yamamoto (JNES)
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<td><strong>H8: New Techniques in Monte Carlo Calculation II</strong></td>
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<tr>
<td><strong>Chairs:</strong> Richard J. Procassini (LLNL, USA), Yasunobu Nagaya (JAEA, Japan)</td>
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<tr>
<td>• Comparison of the Monte Carlo Adjoint-Weighted and Differential Operator Perturbation Methods</td>
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<tr>
<td>Brian C. Kiedrowski (LANL)</td>
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<tr>
<td>• Estimation of Reactivity Worth with Differential Operator Sampling Method</td>
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<td>Yasunobu Nagaya (JAEA)</td>
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<td>• Validation on Swiss LWR Core Configurations of the Updated PSI Effective Delayed Neutron Fraction Methodology for MCNPX 2.6</td>
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<td>Kelly A. Jordan (Paul Scherrer Institute)</td>
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<tr>
<td>• SCALE Sensitivity Calculations Using Contribution Theory</td>
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<td>Bradley T. Rearden (ORNL)</td>
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<td>• Evaluation of the CANDU 6 Neutron Characteristics in View of Application of the Resonance Dependent Scattering Kernel in MCNP(X)</td>
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<td>Ron Dagan (Forschungszentrum Karlsruhe)</td>
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<td>• Monte Carlo Based Diffusion Coefficients for LMFBR Analysis</td>
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<td>W. van Rooijen (University of Fukui)</td>
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<td>• Multi-Group Constants Generation Using a Continuous Energy Monte Carlo Technique for 3D-Core Simulation</td>
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<td>Yutaka Takeuchi (TOSHIBA Corporation)</td>
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<td><strong>I2: Low Energy Electrons and Photons</strong></td>
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<td><strong>Chairs:</strong> H. Grady Hughes (LANL, USA), Yoshihito Namito (KEK, Japan)</td>
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<tr>
<td>• Recent Developments in Low-Energy Electron/Photon Transport for MCNP6</td>
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<td>H. Grady Hughes (LANL)</td>
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<td>• Recent Improvements in Geant4 Electromagnetic Physics Models and Interfaces</td>
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<td>Vladimir Ivanchenko (CERN)</td>
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<td>• Monte Carlo Simulation of Secondary Ions Produced by High Energy Protons in Microelectronic Devices</td>
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<td>Huang Linxing (Northwest Institute of Nuclear Technology)</td>
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<td>• Conceptual Challenges and Computational Progress in X-Ray Simulation</td>
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<td>Lina Quintieri (INFN Genova)</td>
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<td>• Data Libraries as a Collaborative Tool Across Monte Carlo Codes</td>
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<td>Mauro Augelli (INFN Genova)</td>
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<td>• Design, Development and Validation of Electron Ionisation Models for Nano-Scale Simulation</td>
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<td>Hee Seo (Hanyang University)</td>
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<tr>
<td>• Comparison Between Energy Straggling Strategy and Continuous Slowing Down Approximation in Monte Carlo Simulation of Secondary Electron Emission of Insulating Materials</td>
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<td>Maurizio Dapor (Fondazione Bruno Kessler)</td>
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<td>October 20 (Wed)</td>
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<tr>
<td><strong>OC2: Maintenance Engineering Simulation II</strong></td>
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<tr>
<td>Chairs: Toshiyuki Takagi (Tohoku University, Japan), Yuh-Ming Ferng (Department of Engineering and System Science, Taiwan)</td>
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| • Study of Droplet Impingement Phenomena by Fluid/Solid Coupled Simulation  
Hirotoshi Sasaki (Tohoku University) |  |  |
| • Sizing Methodologies for Pipe Wall-Thinning Arising in Guided Wave Analyses  
Fumio Kojima (Kobe University) |  |  |
| • Advancement and Performance in Large Scale Eddy Current Simulations for In-Service Inspection of FBR Steam Generator Tubes  
Ovidiu Mihalache (JAEA) |  |  |
| • Large-Scale Computation of Welding Residual Stress  
Akihiro Kawaguchi (Osaka University) |  |  |
| • Transmutation Process of $^{90}$Sr with 14 MeV Neutron by Nuclear Fusion  
Kentaro Matsui (Tohoku University) |  |  |
| • Magnetic Hysteresis Simulation of Cr Depleted Grain Boundary for Sensitized Ni-Base Superalloy Inconel 600  
Katsuhiko Yamaguchi (Fukushima University) |  |  |
| • Electromagnetic Modeling of Stress Corrosion Cracking for on Depth Sizing Based on Eddy Current Testing  
Keitaro Ohtaki (Tohoku University) |  |  |
| **OE2: Nuclear Fusion Simulation II** |  |  |
| Chairs: Hiroshi Naitou (Yamaguchi University, Japan), Yasuhiro Idomura (JAEA, Japan) |  |  |
| • Multi-Scale Turbulence Simulation in Magnetic Fusion Plasma  
Yasuaki Kishimoto (Kyoto University) |  |  |
| • Simulating Plasma Turbulence with the Global Eulerian Gyrokinetic Code GT5D: Numerical Aspects  
Sébastien Jolliet (JAEA) |  |  |
| • Monte Carlo Simulations of Neoclassical Transport in Toroidal Plasmas  
Shinsuke Satake (National Institute for Fusion Science) |  |  |
| • Monte-Carlo Simulation and Modeling of Collisional Transport in Perturbed Magnetic Field in Toroidal Plasma  
Ryutaro Kanno (National Institute for Fusion Science) |  |  |
| • Parallelization of Gyrokinetic PIC Code for MHD Simulation  
Hiroshi Naitou (Yamaguchi University) |  |  |
| • Kinetic Integrated Modeling of Plasma Heating in Tokamaks  
Hideo Nuga (Kyoto University) |  |  |
| • How to Combine Binary Collision Approximation and Multi-Body Potential for Molecular Dynamics  
Seiki Saito (Nagoya University) |  |  |
### October 21 (Thu) 9:30-11:40

**Hitotsubashi Memorial Hall**

#### E6: Diagnosis

**Chairs:** Jan T.M. Jansen (Health Protection Agency Centre for Radiation, Chemical and Environmental Hazards, UK), Fumiaki Takahashi (JAEA, Japan)

- **Validation of Homogeneous Breast Tissue Assumption in MGD Calculations Using a Realistic Computational Breast Phantom**
  Andy K. Ma (University of Dammam)
- **Comparison of TITAN Hybrid Deterministic Transport Code and MCNP5 for Simulation of SPECT**
  Alireza Haghighat (University of Florida)
- **Calculation of Normalised Organ and Effective Doses to Adult Reference Computational Phantoms from Contemporary Computed Tomography Scanners**
  Jan T.M. Jansen (Health Protection Agency)
- **Simulation of X-Ray CT Using Monte Carlo Method**
  Yuuki Morishita (Nagoya University)
- **Effects of Human Model Configuration in Monte Carlo Calculations on Organ Doses from CT Examinations**
  Fumiaki Takahashi (JAEA)

### October 21 (Thu) 9:30-11:40

**Conference Room 1**

#### G6: High Performance Computing in Nuclear Applications and Laser/Beam Physics

**Chairs:** Masaki Itoh (Shimane University, Japan), Mikhail Kostin (Michigan State University, USA)

- **3D Neutron Transport and HPC: a PWR Full Core Calculation Using Pentran Sn Code and IBM Bluegene/p Computers**
  Tanguy Courau (EDF R&D)
- **HPC Challenges for Deterministic Neutronics Simulations Using APOLLO3 Code.**
  Christophe Calvin (CEA Saclay)
- **PARAFISH: a Parallel FE – Pₙ Neutron Solver Based on Domain-Decomposition**
  Van Criekingen (Karlsruhe Institute of Technology)
- **Full Scale Seismic Simulation of a Nuclear Reactor with Parallel Finite Element Analysis Code for Assembled Structure**
  Tomonori Yamada (JAEA)
- **Full-Scale 3D Vibration Simulator for an Entire Nuclear Power Plant on the Simple Orchestration Application Framework**
  Guehee Kim (JAEA)
- **Design of Diffractive Microlenses with Subwavelength Structures by the Finite-Difference Time-Domain Method and the Genetic Algorithm**
  Kenichi L. Ishikawa (University of Tokyo)
### C6: Shielding (Cask, Reactor, Accelerator)

*Chairs: Arkady Serikov (Karlsruhe Institute of Technology, Germany)*

- Monte Carlo Shielding Calculations for a Spent Fuel Transport Cask with Automated Monte Carlo Variance Reduction  
  Mitsufumi Asami (National Maritime Research Institute)
- Devising Effective SCALE6/MAVRIC Models for Large Shielding Applications  
  Bojan Petrovic (Georgia Institute of Technology)
- Radioprotection Studies for ESS Superconducting Linear Accelerator  
  Daniela Ene (ESS Scandinavia Secretariat)
- The Application of the Monte Carlo Code FLUKA in Radiation Protection Studies for the Large Hadron Collider  
  Stefan Roesler (CERN)
- Application of Particle Transport Code PHITS for Design of J-PARC 1MW Spallation Neutron Source and its Validation  
  Masahide Harada (JAEA)
- Design of Accelerator-Based Solutions to Produce $^{99}$Mo Using Lowly-Enriched Uranium  
  Frederic Stichelbaut (Ion Beam Applications s.a.)

### H9: Variance Reduction Techniques in Monte Carlo Calculation

*Chairs: Brian R Nease (Bettis Laboratory, USA) , Toshihiro Yamamoto (Kyoto University, Japan)*

- A Priori Efficiency Calculations for Monte Carlo Applications in Neutron Transport  
  J. Eduard Hoogenboom (Delft University of Technology)
- An Auto-Importance Sampling Method for Deep Penetration Problems  
  Li Chunyan (Tsinghua University)
- Review of Hybrid (Deterministic/Monte Carlo) Radiation Transport Methods, Codes and Applications at Oak Ridge National Laboratory  
  John C. Wagner (ORNL)
- Tripoli-4 Green's Functions & MCNP5 Importance to Estimate Ex-Core Detector Response on a N4 PWR  
  Christos Trakas (AREVA NP, Paris)
### October 21 (Thu) 9:30-11:40 Conference Room 4

**J2: Monte Carlo Code Development II (Hadron)**

Chairs: Tatsumi Koi (SLAC, USA), Koji Niita (RIST, Japan)

- INCL Intra-Nuclear Cascade and Abla De-Excitation Models in GEANT4
  Pekka Kaitaniemi (CEA/Saclay)
- Benchmark of Spallation Models
  Jean-Christophe David (CEA-Saclay)
- Validation of Event Generator Mode in the PHITS Code for the Low Energy Neutron-Induced Reactions
  Yosuke Iwamoto (JAEA)
- Recent Developments in Pre-Equilibrium and De-Excitation Models in Geant4
  José M. Quesada (University of Sevilla)
- An Overview of Geant4 Hadronic Physics Improvements
  Dennis H. Wright (SLAC National Accelerator Laboratory)
- FLUKA Realistic Modeling of Radiation Induced Damage
  Vasilis Vlachoudis (CERN)

### October 21 (Thu) 9:30-11:40 Conference Room 101

**OB5: GPGPU for Thermal Hydraulics Computation**

Chairs: Takayuki Aoki (Tokyo Institute of Technology, Japan), Taku Nagatake (JAEA, Japan)

- Multiple-GPU Scalability of Phase-Field Simulation for Dendritic Solidification
  Takayuki Aoki (Tokyo Institute of Technology)
- Application of GPU to Multi-Interfaces Advection and Reconstruction Solver (MARS)
  Taku Nagatake (JAEA)
  Takayuki Aoki (Tokyo institute of Technology)
- Multi-GPU Computing for Meso-Scale Atmosphere Model ASUCA
  Takashi Shimokawabe (Tokyo Institute of Technology)
- Multi-Component Fluid Simulations on a Multi-GPGPU PC Using Unsplit Time Integration VSIAM3
  Akio Ikeyama (TOTO LTD.)
## October 21 (Thu) 9:30-11:40 Conference Room 102

**OA3: Quake-Proof Simulations and Modeling for Nuclear Facility II-B**  
Chairs: Kengo Nakajima (The University of Tokyo, Japan), Tomoshi Miyamura (Nihon University, Japan)

- **Large Scale Simulation of Ductile Fracture Process of Microstructured Materials**  
  Rong Tian (Institute of Computing Technology, CAS)
- **Parallel Preconditioners for Iterative Linear Solvers by Extended Hierarchical Interface Decomposition**  
  Kengo Nakajima (The University of Tokyo)
- **Three Dimensional Partitioned Iterative FSI Simulation of Extruded Rod Bundles Immersed in Fluid**  
  Shunji Kataoka (JGC Corporation)
- **Large-Scale FE-Analysis of Steel Building Frames Using E-Simulator**  
  Tomoshi Miyamura (Nihon University)
- **Development of the Fuel Assembly Seismic Analysis Method for Fast Breeder Reactor**  
  Masaaki Inoue (JNES)

## October 21 (Thu) 11:50-12:50 Hitotsubashi Memorial Hall

**Closing Session**  
Chair: Takamasa Mori (JAEA, Japan)

- **Student Award Ceremony**
- **Closing Talk**  
  Toshikazu Takeda (University of Fukui)
- **Presentation by Host of Next SNA and MC Conference**  
  Jean-Christophe Trama (CEA)
2: Poster Sessions

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<td><strong>PA: Monte Carlo Methods/Applications (Nuclear Reactor Analysis/Shielding)</strong></td>
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| (1) The Improvement of the Ring Detector in Monte Carlo Calculation  
Huang Linxing (Northwest Institute of Nuclear Technology) |
| (2) New Display Tool for the Monte Carlo Particle Transport Code TRIPOLI-4  
Francois-Xavier Hugot (CEA) |
| (3) Development of Open Code System for Core Design of Boiling Water Reactor  
Yoshiyuki Ichioka (University of Tohoku) |
| (5) Enhancements to the MCNP/MCNPX Mesh Tally Visualization and Analysis Capabilities in Moritz  
Kenneth A. Van Riper (White Rock Science) |
| (6) New Features of the Mercury Monte Carlo Particle Transport Code  
Richard J. Procassini (Lawrence Livermore National Laboratory) |
| (7) Benchmark Calculations of Sodium-Void Experiments with Uranium Fuels at the Fast Critical Assembly FCA  
Masahiro Fukushima (JAEA) |
| (8) Higher Order a Mode Eigenvalue Calculation by Monte Carlo Power Iteration  
Toshihiro Yamamoto (Kyoto University) |
| (9) Development of a Geometry-Coupled Visual Analysis System for MCNP  
Pengcheng Long (Chinese Academy of Sciences) |
| (10) Evaluation of Tehran Research Reactor (TRR) Control Rod Worth Using MCNP4C Computer Code  
Mohammad Hosseini (Sharif University of Technology) |
| (11) A Conceptual Design Study for Active Nondestructive Assay System by Photon Interrogation for Uranium-Bearing Waste with MVP Code and Evaluated Photonuclear Data  
Takeshi Sakurai (JAEA) |
| (12) Computing Acceleration for a Pin-By-Pin Core Analysis Method Using a Three-Dimensional Direct Response Matrix Method  
Takeshi Mitsuyasu (Hitachi, Ltd.) |
| (13) Activation Calculation for Accelerator Dismantlement by PHITS  
Asami Ito (ATOX Co., Ltd.) |
| (14) MCNPX Simulation of the BN-600 Fast-Spectrum Core Mock-up at BFS-2 Zero-Power Facility  
Alessandro Marinoni (EPFL) |
| (15) Monte Carlo Research Activities Performed in Special Research Committee of Atomic Energy Society of Japan  
Kiyoshi Sakurai (Former Researcher of JAEA) |
| (16) Modeling of Impurities Activation in the RBMK Reactor Graphite Using MCNPX  
Rita Plukiené (CENTER FOR PHYSICAL SCIENCES AND TECHNOLOGY) |
| (17) Analysis of Sample Worth for Dy$_2$O$_3$, Ho$_2$O$_3$, Er$_2$O$_3$ and Tm$_2$O$_3$ Measured at KUCA by MVP with Recent Version of ENDF and JENDL  
Takanori Kitada (Osaka University) |
(18) Influence of High-Energy Nuclear Interaction Model Choice in the Shielding Calculations for the Facility with the Proton Accelerator
   Tomas Urban (Czech Technical University)
(19) A Supercomputing Application for Reactors Core Design and Optimization
   Edouard Hourcade (CEA)
(20) Heterogeneous 3-D $S_N$ Transport Reactor Calculations Using Attila
   Rober P. Rulko (Canadian Nuclear Safety Commission)
(21) Benchmark Test of JENDL-4 Based on Integral Experiments at JAEA/FNS
   Kosuke Takakura (JAEA)
(22) Modeling of $H(n,p)$ Recoil Proton Injection Into LWR Fuel Cladding with Sequential Use of MCNP and SRIM Codes
   Yasushi Nauchi (CRIEPI)
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<td><strong>PB: Monte Carlo Applications (Radiotherapy, Dosimetry, Device, Other)</strong></td>
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1. Fast Monte Carlo Dose Calculation Using GPGPU  
   Atushi Myojoyama (Tokyo Metropolitan University)

2. Neutron Dose Calculation for Polygon-Surface Phantom Directly Coupled with Geant4  
   Chan Hyeong Kim (Hanyang University)

3. Monte Carlo Study of a New Mobile Electron Accelerator Head for Intra Operative Radiation Therapy (IORT)  
   Anna Wysocka-Rabin (The Andrzej Soltan Institute for Nuclear Studies)

4. Simulation and Experimental Verification of Dose Distributions of Electron Beams  
   Jaroslav Kluson (Czech Technical University)

5. Calculation of a Linac Electron Fluence and its Derived Photon Spectra by Monte Carlo Simulation and by Reconstruction from Depth Dose Curves  
   Rafael Miró (ISIRYM. Universitat Politècnica de València)

6. Monte Carlo Modeling of the MLC-Elekta Precise Linac: Influence of Multileaf Collimator on Dose Calculation  
   Rafael Miró (ISIRYM Universitat Politècnica de València)

7. Study on Microdosimetry for Boron Neutron Capture Therapy  
   Tetsuya Mukawa (Tokyo City University)

8. Application of Monte-Carlo Treatment Planning System "JCDS-FX with PHITS" to Proton Radiotherapy  
   Hiroaki Kumada (University of Tsukuba)

9. Evaluation of the Influence on Electric Device by the Secondary Neutron Beam Generated in Radiotherapy  
   Tomonori Isobe (University of Tsukuba)

10. Estimate of Photo-Nuclear Reaction in a Medical Linear Accelerator Using a Water-Equivalent Phantom  
    Toshioh Fujibuchi (University of Tsukuba)

11. Estimate of Photoneutron Strength in Radiotherapy Room Shielding  
    Satoshi Obara (Ibaraki Prefectural University of Health Science)

    X. George Xu (Rensselaer Polytechnic Institute)

13. Gamma Imaging Simulations for Neutron Capture in BNCT by Monte-Carlo Codes  
    Yoshiko Okazaki (JAEA)

15. Influence of Radionuclide Distributions in Human Bodies on Whole-Body Counting  
    Masa Takahashi (JAEA)

16. Recent Improvements in the Geant4 Bertini-Style Cascade  
    Dennis H. Wright (SLAC National Accelerator Laboratory)

17. New Geant4 Electromagnetic Physics Developments for Ion Therapy Applications  
    Toshiyuki Toshito (Nagoya City Hall)

    Shin-ichiro Abe (Kyushu University)
(19) Benchmarking of PHITS on Pion Production for Medium-Energy Physics
   Norihiro Matsuda (JAEA)

(20) Radiation Transport Calculation Using PHITS Code for Radiation Heat Load and Damage to
   Superconducting Radioactive Isotope Beam Separator BigRIPS at RIKEN
   Tetsuya Ohnishi (RIKEN)

(21) Radiation Transport Calculation Using PHITS Code for the Activation of BigRIPS Separator at RIKEN
   Radioactive Isotope Beam Factory and Comparison with the Measurement
   Kanenobu Tanaka (RIKEN)

(22) Simulated Neutron Response Functions of Phoswich-type Neutron Detector and Thin Organic Liquid
   Scintillator
   Masashi Takada (National Institute of Radiological Sciences)

(23) Monte Carlo Simulation of Neutrons, Protons, Ions and Alpha Particles Involved in Soft Errors in
   Advanced SRAM
   Frédéric Wrobel (University of Montpellier)

(24) 2-Dimensional Coupled Algorithm for Simulating Dose-Rate Transient Effects of Semiconductor Devices
   Huang Linxing (Northwest Institute of Nuclear Technology)

(25) Monte Carlo Simulation of Secondary Ions Produced by High Energy Protons in Microelectronic Devices
   Huang Liuxing (Northwest Institute of Nuclear Technology)

(26) Target Design for Submicron Focus X-Ray Systems of Transmission Type
   Yoshiko Okazaki (JAEA)

(27) Simulation of Gamma-Ray Irradiation of Lettuce Leaves in a $^{137}$Cs Irradiator Using MCNP
   Jongsoon Kim (Texas A&M University)

(28) Analysis of a Canberra HP-Ge Detector by Monte Carlo-Calculation
   Dorothea Sommer (TU Dresden)

(29) Monte Carlo Code for the Damage of Bio-Molecules Irradiated by X-Ray Free Electron Lasers:
   Incorporation of Electron Impact Ionization Processes
   Kengo Moribayashi (JAEA)

(30) Joint Application of Perl Scripts and MCNPX in Solving the Dynamic-Geometry Related Problems in
   Proton Beam Radiotherapy
   Fada Guan (Texas A&M University)
October 20 (Wed) 14:00-18:30  
Conference Room 201-203

PC: Supercomputing in Nuclear Applications

(1) Method for Loading Marker Particles for Arbitrary Distribution Functions and Application for Simulation of High-Energy Ion Dynamics in Tokamak Plasma  
Andreas Bierwage (Associazione EUROATOM-ENEA sulla Fusione)

(2) Performance Evaluations of Advanced Massively Parallel Platforms Based on Gyrokinetic Toroidal Five-Dimensional Eulerian Code GT5D  
Yasuhiro Idomura (JAEA)

(3) Development of Integrated Plasma Modeling in Toroidal Configuration  
Noriyoshi Nakajima (National Institute for Fusion Science)

(4) Thermal Properties of UO$_2$ by Molecular Dynamics Simulation  
Teppei Uchida (JAEA)

(5) Molecular Dynamics Study on Grain Boundary Diffusion of Actinides and Oxygen in Oxide Fuels  
Masahiro Nishina (Kyushu University)

(6) Molecular Modelling of Aqueous Actinides  
Motoyuki Shiga (JAEA)

(7) Data Assimilation in the Process of Source Term Evaluation, Radioactive Cloud Dispersion and Impacts Modeling  
Eva Smejkalova (ABmerit- nuclear science and software)

(8) Simulation of Concentrations of Anthropogenic Radionuclides in the Japan Sea  
Hideyuki Kawamura (JAEA)

(9) Simulation of GEM-TPC Prototype for the Super-FRS Beam Diagnostics System at FAIR  
Matti Kalliokoski (Helsinki Institute of Physics)

(10) A Numerical Simulation of $^{129}$I in the Atmosphere Emitted from Nuclear Fuel Reprocessing Plants  
Masato Nishizawa (JAEA)

(11) Molecular Dynamics Simulation System for Structural Analysis of Biomolecules by High Performance Computing  
Hisashi Ishida (JAEA)

(12) A Study of Released Radionuclides in the Coastal Area from a Discharge Pipe of Nuclear Fuel Reprocessing Plant in Rokkasyo, Aomori, Japan  
Takuya Kobayashi (JAEA)

(13) A New Approach for Building an Atomic Model from a Three-Dimensional Electron Microscopy Data  
Atsushi Matsumoto (JAEA)

(14) Kinetic Monte Carlo Simulations of Initial Process of Solute Atom Cluster Formations Based on Ab Initio Database  
Kiyoshi Betsuyaku (CRIEPI)

(15) Large Scale Numerical Simulation for Superfluid Turbulence  
Narimasa Sasa (JAEA)

Shohei Abe (University of Hyogo)

(17) Haldane Gap of the S=5 Heisenberg Antiferromagnetic Chain by Numerical Diagonalization Study  
Hiroki Nakano (University of Hyogo)
(18) Hydrogen-Grain Boundary Interaction in Fe, Fe-C, and Fe-N Systems
   Ryosuke Matsumoto (Kyoto University)
(19) Excitation Gap of Antiferromagnetic Spin Ladder of Half Depleted Rung Bond by Numerical Diagonalization Study
   Tokuro Shimokawa (University of Hyogo)
(20) KMC Analysis of Nucleation and Growth of SIA-Clusters in Cubic Silicon Carbide during Irradiation
   Yoshiyuki Watanabe (Kyoto University)
(21) Instability Analysis in Peach Bottom NPP Using a Whole Core Thermalhydraulic-Neutronic Model with Relap5/Parcs V2.7
   Rafael Miró (Universitat Politècnica de València)
(22) Turbine Trip Transient Analysis in Peach Bottom NPP with TRAC-BF1 Code and Simtab-1D Methodology
   Rafael Miró (Universitat Politècnica de València)
(23) Elastic-Plastic Connection Model Describing Dynamic Interactions of Component Connections
   Akemi Nishida (JAEA)
(24) Research on Monte Carlo Simulation Method of Industry CT System
   Wu Zhen (Nuctech Company Limited)
   Susumu Yamada (JAEA)