# Program at a Glance

## Program Overview

<table>
<tr><td></td><td>Oct 17(Sun)</td><td>Oct 18(Mon)</td><td>Oct 19(Tue)</td><td>Oct 20(Wed)</td><td>Oct 21(Thu)</td></tr>
<tr><td>9:00</td><td></td><td>Open gate</td><td>Open gate</td><td>Open gate</td><td>Open gate</td></tr>
<tr><td>9:30–11:00</td><td rowspan="2"></td><td>Registration<br>(9:20 – anytime)</td><td rowspan="2">Plenary<br>(9:30–11:00)</td><td>Plenary<br>(9:30–10:40)</td><td rowspan="2">Technical<br>(9:30–11:40)</td></tr>
<tr><td rowspan="2">Opening Plenary<br>(10:20–11:20)</td><td>Break (10min)</td></tr>
<tr><td>11:00–11:10</td><td>Open gate</td><td>Break (10min)</td><td rowspan="3">Technical<br>(10:50–12:40)</td></tr>
<tr><td rowspan="3">11:10–12:40</td><td rowspan="3">Registration<br>(11:00 – anytime)</td><td>Break (5min)</td><td rowspan="2">Technical<br>(11:10–12:40)</td><td>Break (10min)</td></tr>
<tr><td>Plenary<br>(11:25–12:40)</td><td>Closing Session<br>(11:50–12:50)</td></tr>
<tr><td>12:40–14:10</td><td colspan="4">Lunch (90min)</td><td></td></tr>
<tr><td>14:10–15:40</td><td rowspan="3">FLUKA Tutorial<br>(14:10–17:30)</td><td>Poster / Technical</td><td>Poster / Technical</td><td>Poster / Technical</td><td rowspan="3">PHITS Tutorial<br>(14:00–17:00)</td></tr>
<tr><td>15:40–16:00</td><td>Break (20min)</td><td>Break (20min)</td><td>Break (20min)</td></tr>
<tr><td>16:00–17:30</td><td rowspan="2">Technical<br>(16:00–18:30)</td><td>Technical<br>(16:00–17:30)</td><td rowspan="2">Technical<br>(16:00–18:30)</td></tr>
<tr><td>17:30–17:50</td><td rowspan="2">Welcome Reception<br>(17:40–19:00)</td><td>Break (20min)</td><td></td></tr>
<tr><td>17:50–19:20</td><td></td><td rowspan="2">Banquet<br>(18:00–20:30)</td><td></td></tr>
</table>

* 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

| | Oct.18 | | Oct.19 | | | Oct. 20 | | | Oct. 21 |
|---|---|---|---|---|---|---|---|---|---|
| **Technical Sessions** | | | | | | | | | |
| Materials Science | | | A1 | | | A2 | | | |
| Nuclear Plant Analysis, Thermal Hydraulics | | | | | | | | B1 | |
| Reactor Physics, Radiation Shielding/Dosimetry, Accelerator | | C1 | | | C2 | C3 | C4 | C5 | C6 |
| Nuclear Fuel, Nuclear Fuel Cycle, Repository Performance | | | | | D1 | | | | |
| Radiotherapy/Diagnosis, Biomedicine | E1 | E2 | | | E3 | E4 | E5 | | E6 |
| Other Applications (Radiation Device, Fluid Dynamics, Earthquake Proof, Structural Analysis, Space & Aviation) | F1 | | F2 | | F3 | | F4 | | |
| Computer Science/Information Technology/High Performance Computing | | G1 | G2 | G3 | G4 | | | G5 | G6 |
| Neutron-Photon | | H1 | H2, H3 | H4 | H5 | H6 | H7 | H8 | H9 |
| Photon-Electron | | | | | | I1 | | I2 | |
| Hadron, Other particles | | J1 | | | | | | | J2 |
| **Organized Sessions** | | | | | | | | | |
| Quake-Proof Simulations and Modeling for Nuclear Facility | OA1 | OA2 | | | | | | | OA3 |
| Fluid Dynamics Simulation | | OB1 | OB2 | OB3 | OB4 | | | | OB5 |
| Maintenance Engineering Simulation | | | | | | OC1 | | OC2 | |
| Computer Modeling of Nuclear Materials | OD1 | | OD2 | | | | | | |
| Nuclear Fusion Simulation | | | | | | OE1 | | OE2 | |
| **Poster Sessions** | | | | | | | | | |
| Monte Carlo Methods/Applications (Nuclear Reactor Analysis/Shielding) | PA | | | | | | | | |
| Monte Carlo Applications (Radiotheraphy, Dosimetry, Device, Other) | | | | PB | | | | | |
| Supercomputing in Nuclear Applications | | | | | | | PC | | |

# 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)

| October 18 (Mon) | 14:10-15:40 | Conference Room 1 |
|---|---|---|

### OA1: Quake-Proof Simulations and Modeling for Nuclear Facility I

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

- High Performance Multi-Scale and Multi-Physics Computation of Nuclear Power Plant Subjected to Strong Earthquake : An Overview
  Shinobu Yoshimura (The University of Tokyo)
- Seismic Response Analysis Using Three Dimensional FEM Analysis for BWR Nuclear Reactor Facilities
  Takehiro Oku (The Tokyo Electric Power Company)
- Comprehensive Numerical Analysis of Seismic Response of Nuclear Power Plant Building
  Muneo Hori (University of Tokyo)
- Structural Simulation and Modeling for Assembly in Real Space
  Norihiro Nakajima (JAEA)
- Input Force Identification by Apparent Mass Approach
  Takuya Yoshimura (Tokyo Metropolitan University)

| October 18 (Mon) | 14:10-15:40 | Conference Room 2 |
|---|---|---|

### F1: Environment, Nuclear Accident

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

- Parallel Computing for Radiological Impacts Assessment during Nuclear Accident
  Dušan Suchoň (ABmerit-nuclear science and software)
- Development of Coupled Models for Regional Water Cycle and Material Transport in the Atmospheric, Terrestrial, and Oceanic Environment
  Haruyasu Nagai (JAEA)
- Development of Atmosphere-Soil-Vegetation Model for Investigation of Radioactive Materials Transport in Terrestrial Biosphere
  Genki Katata (JAEA)
- LES on Plume Dispersion within a Regular Array of Cubic Buildings
  Hiromasa Nakayama (JAEA)

| October 18 (Mon) | 14:10-15:40 | Conference Room 3 |
|---|---|---|

### OD1: Computer Modeling of Nuclear Materials I

Chairs: Naoto Sekimura(University of Tokyo, Japan), Fei Gao (PNNL, USA)

• Kinetic Monte Carlo Modeling of Radiation Effects in Fuels and Materials
Brian D. Wirth (University of California)

• Atomic Structure and Bonding Nature of Metal/Ceramics Interface: HRTEM, EELS and Ab-Initio Calculation
Norihito Sakaguchi (Hokkaido University)

• Chemical States of Fission Products and Actinides in Irradiated Oxide Fuels Analyzed by Thermodynamic Calculations and Post-Irradiation Examinations
Kosuke Tanaka (JAEA)

• Formation of Defect-Cluster Embryos in Nuclear Materials during Irradiation
Kazunori Morishita (Kyoto University)

• Numerical Study of Irradiation Damage Accumulation in BCC-Fe Using KMC Code with Elastic Interaction Between SIA Loops
Kenichi Nakashima (CRIEPI)

| October 18 (Mon) | 16:00-18:30 | Hitotsubashi Memorial Hall |
|---|---|---|

### E2: Radiotheraphy (Photon)

Chairs: Jan T.M. Jansen (Health Protection Agency, UK), Gui LI (Institute of Plasma Physics, China)

• Photon Energy Spectrum Reconstruction Based on Monte Carlo and Measured Percentage Depth Dose in Accurate Radiotherapy
Gui Li (Chinese Academy of Sciences)

• Implementation of Multileaf Collimator in a LINAC MCNP5 Simulation Coupled with the Radiation Treatment Planning System PLUNC
Rafael Miró (Universitat Politècnica de València)

• Comparison of MCNP5 Dose Calculations inside the Rando Phantom Irradiated with a Linac 5 X 5 Photon Beam against Treatment Planning System PLUNC
Rafael Miró (Universitat Politècnica de València)

• GEANT4 Simulation to Study the Sensitivity of a MICRON Silicon Strip Detector Irradiated by a SIEMENS PRIMUS Linac
Miguel A. Cortés-Giraldo (University of Sevilla)

• Dose Distribution Calculation of Space Coherent X-Ray Therapy
Hiroshi Iwase (KEK)

| October 18 (Mon) | 16:00-18:30 | Conference Room 1 |
|---|---|---|

### 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.)

| October 18 (Mon) | 16:00-18:30 | Conference Room 2 |
|---|---|---|

### 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)

| October 18 (Mon) | 16:00-18:30 | Conference Room 101 |
|---|---|---|

### 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)
- Development of an International Matrix-Solver Prediction System on a French-Japanese International Grid Computing Environment
  Yoshio Suzuki (JAEA)
- Experience Feedback in Software Development Using the X10 Language
  Marc Tajchman (CEA)

| October 18 (Mon) | 16:00-18:30 | Conference Room 102 |
|---|---|---|

### 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)

| October 19 (Tue) | 9:30-11:00 | Hitotsubashi Memorial Hall |
|---|---|---|

### P2: Advanced Supercomputing in Nuclear Application

Chairs: Brian D. Wirth (University of Tennessee, USA), Tomoaki Kunugi (Kyoto University, Japan)

- Particle Simulation for Fluid Dynamics with Free Surfaces
  Seiichi Koshizuka (University of Tokyo)
- Stochastic methods for simulations of irradiated materials
  Vasily Bulatov (LLNL)
- Scientific Grand Challenges in Fusion Energy Sciences and the Role of Computing at the Extreme Scale
  William Tang (Princeton University)

| October 19 (Tue) | 11:10-12:40 | Hitotsubashi Memorial Hall |
|---|---|---|

### OD2: Computer Modeling of Nuclear Materials II

Chairs: Kazunori Morishita（Kyoto University, Japan), Brian D. Wirth (University of Tennessee, USA)

- Multi Scale Modeling of Helium Effects in Iron
  Fei Gao (Pacific Northwest National Laboratory)
- First-Principles Modeling of Defective Structures in Nonstoichiometric Ceramic Fuels
  Ying Chen (Tohoku University)
- First-Principle Calculations of Hydrogen Interaction with Vacancies and Dissolved Atoms in Tungsten
  Daiji Kato (National Institute for Fusion Science)
- Development of a Potential Model for W-H Systems
  Takuji Oda (The University of Tokyo)
- First-Principles Study of the Grain-Boundary Embrittlement of Metals
  Masatake Yamaguchi (JAEA)

| October 19 (Tue) | 11:10-12:40 | Conference Room 1 |
|---|---|---|

### OB2: Computational Fluid Dynamics in Nuclear Power System

Chairs: Kazuyuki Takase (JAEA, Japan), Hiroyuki Yoshida (JAEA, Japan)

- Numerical Simulation of Boiling Two-Phase Flow in a Simulated Subchannel of Fuel Assemblies Excited by Earthquake Oscillation
  Takeharu Misawa (JAEA)
- Development of Numerical Simulation Code for Thermal Striping Phenomena in Japan Sodium Cooled Fast Reactor
  Masaaki Tanaka (JAEA)
- Two-Phase Flow Simulation of Gas Entrainment Phenomena in Large-Scale Fast Reactor
  Kei Ito (JAEA)
- Development of a Sodium-Water Reaction Model for Sodium-Cooled Fast Reactors Using a CFD Code
  Kazuo Haga (JNES)
- Numerical Analysis on Thermal-Hydraulics of Supercritical Water Flowing in a Tight-Lattice Fuel Bundle
  Toru Nakatsuka (JAEA)

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

### 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 3 |
|---|---|---|

### 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 4 |
|---|---|---|

### 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 101 |
|---|---|---|

### 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)

| October 19 (Tue) | 11:10-12:40 | Conference Room 102 |
|---|---|---|

### 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)

| October 19 (Tue) | 14:10-15:40 | Conference Room 1 |
|---|---|---|

### 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)

| October 19 (Tue) | 14:10-15:40 | Conference Room 2 |
|---|---|---|

### G3: Information Technology and its Applications II

Chairs: Ken Naono (Hitachi, Ltd., Japan), Marc Tajchman (CEA, France)

• The Impact of Monte Carlo Simulation: A Scientometric Analysis of Scholarly Literature
Maria Grazia Pia (INFN Genova)

• SimpleGeo − New Developments in the Interactive Creation and Debugging of Geometries for Monte Carlo Simulations
Christian Theis (CERN)

• Physics Data Management Tools: Computational Evolutions and Benchmarks
Mincheol Han (Hanyang University)

| October 19 (Tue) | 14:10-15:40 | Conference Room 3 |
|---|---|---|

### H4: Monte Carlo Code Development I

Chairs: Takamasa Mori (JAEA, Japan), LEE Yi-Kang (CEA, France)

• SCALE Monte Carlo Eigenvalue Methods and New Advancements
Sedat Goluoglu (ORNL)

• Advances in Sensitivity Analysis Capabilities with SCALE 6.0
Bradley T. Rearden (ORNL)

• Use of the Serpent Monte Carlo Reactor Physics Code for Full-Core Calculations
Jaakko Leppänen (VTT Technical Research Centre of Finland)

• Hybrid and Parallel Domain-Decomposition Methods Development to Enable Monte Carlo for Reactor Analyses
John C. Wagner (ORNL)

| October 19 (Tue) | 16:00-17:30 | Hitotsubashi Memorial Hall |
|---|---|---|

### E3: Radiotheraphy (Algorithm and Software)

Chairs: Takashi Sasaki (KEK, Japan), Pedro Arce (CIEMAT, Spain)

• Epistemic and Systematic Uncertainties in Monte Carlo Simulation: an Investigation in Proton Bragg Peak Simulation
Maria Grazia Pia (INFN Genova)

• GAMOS: An Easy and Flexible Way to Use Geant4
Pedro Arce (CIEMAT)

• Patient-Specific Multi-Scale Monte Carlo Simulations for Radiation Therapy: from Macroscopic Radiation Transport to DNA Damage
Joseph J Lucido (University of British Columbia)

• A Brachytherapy Treatment Planning System Based on Dicom Images and MCNP5 Calculations Optimized with Artificial Neural Network
Amir R. Moghadam (Shiraz University)

| 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)

| October 19 (Tue) | 16:00-17:30 | Conference Room 4 |
|---|---|---|

### C2: Shielding (Fusion)

Chairs: Mitsufumi Asami (National Maritime Research Institute, Japan),
Paul P.H. Wilson (University of Wisconsin-Madison, USA)

- High Performance Parallel Monte Carlo Transport Computations for ITER Fusion Neutronics Applications
  Arkady Serikov (Karlsruhe Institute of Technology)
- A Novel Method to Carry out Uncertainty Analyses for ITER Shielding Calculations: a Useful Tool in the Engineering and Design Phase
  Alfred Hogenbirk (NRG)
- Conceptual Radiation Shielding Design of Superconducting Tokamak Fusion Device by PHITS
  Atsuhiko M. Sukegawa (JAEA)
- Important Remarks on Latest Multigroup Libraries
  Chikara Konno (JAEA)

| October 19 (Tue) | 16:00-17:30 | Conference Room 101 |
|---|---|---|

### F3: Monte Carlo Applications II (Device Damage)

Chairs: Dennis H. Wright (SLAC, USA), Markus Brugger (CERN, Switzerland)

- R&D Project for a Geant4-Based, Multi-Scale Simulation Environment to Study the Radiation Effects on Electronic Devices
  Julien Mekki (University of Montpellier)
- GEANT4 Microdosimetry Study of Ionizing Radiation Effects in Digital ASIC's
  Miguel A. Cortés-Giraldo (University of Sevilla)
- Fluka Capabilities and Applications for Radiation Damage to Electronics at High-Energy Hadron Accelerators
  Markus Brugger (CERN)
- Calculation for 1-MeV Equivalent Factor of Neutrons with Different Spectrums
  Huang Linxing (Northwest Insititution of Nuclear Technology)

| October 19 (Tue) | 16:00-17:30 | Conference Room 102 |
|---|---|---|

### D1: Nuclear Fuel, Nuclear Fuel Cycle, Repository Performance

Chairs: Ying Chen (Tohoku University, Japan), Kenji Konashi (Tohoku University, Japan)

- Numerical Tools for the Evaluation of Super-Compacted Radioactive Waste Residues
  Stephan Schneider (Forschungszentrum Juelich GmbH)
- Development of Homogeneous Filling Method of Particulate Materials Into Compression Mold for Nuclear Fuel Process
  Sadato Makino (Doshisha University)
- Relativistic Ab Initio Calculations for Nuclear Volume Effects in Isotope Separations
  Minori Abe (Tokyo Metropolitan University)

| 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: Radiotheraphy (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), Francoi-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)

| October 20 (Wed) | 10:50-12:40 | Conference Room 4 |
|---|---|---|

### I1: New Techniques and Applications of Photon-Electron

Chairs: Maria Grazia Pia (INFN, Italy), Kazuaki Kosako (Shimizu corporation, Japan)

- Environmental Adaptability and Mutants: Exploring New Concepts in Particle Transport for Multi-Scale Simulation
  Maria Grazia Pia (INFN Genova)
- New Techniques in Monte Carlo Simulation: Experience with a Prototype of Generic Programming Application to Geant4 Physics Processes
  Marcia Begalli (INFN Genova)
- Micro-Scale Dose Distribution of Microbeam X Rays: Measurement and MC Calculation
  Nobuteru Nariyama (Japan Synchrotron Radiation Research Institute)
- Flux-Probability Distributions for Radiation Transport in Binary Stochastic Media
  Brian C. Franke (SNL)

| October 20 (Wed) | 10:50-12:40 | Conference Room 101 |
|---|---|---|

### OC1: Maintenance Engineering Simulation I

Chairs: Fumio Inada（Central Research Institute of Electric Power Industry, Japan）, Ovidiu Mihalache (JAEA, Japan)

- Investigating the Characteristics of FAC Sites Using CFD Methodology (Invited)
  Yuh-Ming Ferng (Tsinghua University)
- CFD Application for Piping Wall Thinning and Fatigue Due to Acoustic Vibration
  Ryo Morita (CRIEPI)
- Integrated Super Computational Prediction of Liquid Droplet Impingement Erosion
  Jun Ishimoto (Tohoku University)
- Turbulent Swirl Flow in a Pipe with an Orifice
  Haruo Terasaka (University of Aizu)
- Modeling of 3D SCC Crack Growth with SGBEM-FEM Alternating Method
  Gennadiy Nikishkov (University of Aizu)

| October 20 (Wed) | 10:50-12:40 | Conference Room 102 |
|---|---|---|

### OE1: Nuclear Fusion Simulation I

Chairs: Shinichi Satake (Tokyo University of Science, Japan), Tomoaki Kunugi (Kyoto University, Japan)

- Direct Numerical Simulation of MHD Turbulent Flows with High-Pr Heat Transfer
  Yoshinobu Yamamoto (Kyoto University)
- The Effect of MHD on Heat and Mass Transfer in Turbulent Duct Flow
  Takehiko Yokomine (Kyushu University)
- DNS of MHD Turbulet Flow with Buoyancy
  Keito Furumi (Tokyo University of Science)
- Numerical Simulation of Turbulent Flow of Coolant in a Test Blanket Module of Nuclear Fusion Reactor
  Yohji Seki (JAEA)

| October 20 (Wed) | 14:10-15:40 | Hitotsubashi Memorial Hall |
|---|---|---|

### E5: Radiotheraphy (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)

| October 20 (Wed) | 14:10-15:40 | Conference Room 2 |
|---|---|---|

### 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 á 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)

| October 20 (Wed) | 14:10-15:40 | Conference Room 3 |
|---|---|---|

### 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)

| 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)

| October 20 (Wed) | 16:00-18:30 | Conference Room 1 |
|---|---|---|

### 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.)

| October 20 (Wed) | 16:00-18:30 | Conference Room 2 |
|---|---|---|

### 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)

| October 20 (Wed) | 16:00-18:30 | Conference Room 3 |
|---|---|---|

### H8: New Techniques in Monte Carlo Calculation II

Chairs: Richard J. Procassini (LLNL, USA), Yasunobu Nagaya (JAEA, Japan)

- Comparison of the Monte Carlo Adjoint-Weighted and Differential Operator Perturbation Methods
  Brian C. Kiedrowski (LANL)
- Estimation of Reactivity Worth with Differential Operator Sampling Method
  Yasunobu Nagaya (JAEA)
- Validation on Swiss LWR Core Configurations of the Updated PSI Effective Delayed Neutron Fraction Methodology for MCNPX 2.6
  Kelly A. Jordan (Paul Scherrer Institute)
- SCALE Sensitivity Calculations Using Contributon Theory
  Bradley T. Rearden (ORNL)
- Evaluation of the CANDU 6 Neutron Characteristics in View of Application of the Resonance Dependent Scattering Kernel in MCNP(X)
  Ron Dagan (Forschungszentrum Karlsruhe)
- Monte Carlo Based Diffusion Coefficients for LMFBR Analysis
  W. van Rooijen (University of Fukui)
- Multi-Group Constants Generation Using a Continuous Energy Monte Carlo Technique for 3D-Core Simulation
  Yutaka Takeuchi (TOSHIBA Corporation)

| October 20 (Wed) | 16:00-18:30 | Conference Room 4 |
|---|---|---|

### I2: Low Energy Electrons and Photons

Chairs: H. Grady Hughes (LANL, USA), Yoshihito Namito (KEK, Japan)

- Recent Developments in Low-Energy Electron/Photon Transport for MCNP6
  H. Grady Hughes (LANL)
- Recent Improvements in Geant4 Electromagnetic Physics Models and Interfaces
  Vladimir Ivanchenko (CERN)
- Monte Carlo Simulation of Secondary Ions Produced by High Energy Protons in Microelectronic Devices
  Huang Linxing (Northwest Institute of Nuclear Technology)
- Conceptual Challenges and Computational Progress in X-Ray Simulation
  Lina Quintieri (INFN Genova)
- Data Libraries as a Collaborative Tool Across Monte Carlo Codes
  Mauro Augelli (INFN Genova)
- Design, Development and Validation of Electron Ionisation Models for Nano-Scale Simulation
  Hee Seo (Hanyang University)
- Comparison Between Energy Straggling Strategy and Continuous Slowing Down Approximation in Monte Carlo Simulation of Secondary Electron Emission of Insulating Materials
  Maurizio Dapor (Fondazione Bruno Kessler)

| October 20 (Wed) | 16:00-18:30 | Conference Room 101 |
|---|---|---|

### OC2: Maintenance Engineering Simulation II

Chairs: Toshiyuki Takagi (Tohoku University, Japan),
Yuh-Ming Ferng (Department of Engineering and System Science, Taiwan)

• 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)

| October 20 (Wed) | 16:00-18:30 | Conference Room 102 |
|---|---|---|

### 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 − $P_N$ 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)

| October 21 (Thu) | 9:30-11:40 | Conference Room 2 |
|---|---|---|

### 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.)

| October 21 (Thu) | 9:30-11:40 | Conference Room 3 |
|---|---|---|

### 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)
- High Performance of Lattice Boltzmann Method on Multi-Node GPU Cluster and its Application on Incompressible Flow Computation
  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 Ikebata (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

| October 18 (Mon) | 14:00-18:30 | Conference Room 201-203 |
|---|---|---|

### PA: Monte Carlo Methods/Applications (Nuclear Reactor Analysis/Shielding)

(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 Plukienė (CENTER FOR PHYSICAL SCIENCES AND TECHNOLOGY)

(17) Analysis of Sample Worth for $Dy_2O_3$, $Ho_2O_3$, $Er_2O_3$ and $Tm_2O_3$ 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)

| October 19 (Tue) | 14:00-18:30 | Conference Room 201-203 |
|---|---|---|

## PB: Monte Carlo Applications (Radiotheraphy, Dosimetry, Device, Other)

(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)

(12) A Respiration-Simulating Phantom for 4D Radiation Treatment Planning: Finite-Element and Monte Carlo Modeling
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)

(18) Implementation of a Forced Collision Method in the Estimation of Deposit Energy Distribution with the PHITS Code
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 Election 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)

(16) Numerical Diagonalization Study on the S=3D1/2 Frustrated Three-Leg Quantum Spin Ladder Systems: Ferrimagnetic and Spin Liquid Phases

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)

(25) High Performance Computing of Density Matrix Renormalization Group Method for 2-Dimensional Model: Parallelization Strategy toward Peta Computing

Susumu Yamada (JAEA)