

16th International Symposium on
REACTOR DOSIMETRY

May 7-12, 2017

Santa Fe, NM
USA

Program and Book of Abstracts



Sixteenth International Symposium on Reactor Dosimetry

May 7-12, 2017

La Fonda on the Plaza

Santa Fe, NM, USA

Welcome to Santa Fe, New Mexico and the Sixteenth International Symposium on Reactor Dosimetry.

The International Symposium on Reactor Dosimetry is held approximately every three years to provide a forum for exchange of news and information on state-of-the-art techniques, data, codes, and standardization of radiation metrology. The Symposium is co-sponsored by the European Working Group on Reactor Dosimetry, EWGRD, and the American Society for Testing and Materials, ASTM, Committee E-10 on Nuclear Technology and Applications.

The focus of the Symposium is dosimetry for the assessment of irradiated reactor materials and reactor experiments, featuring radiation metrology techniques, data bases and standardization. Key topics include:

- Reactor surveillance and plant life management
- Nuclear data
- Neutron and gamma transport calculations and modeling
- Retrospective dosimetry
- Experimental techniques & new measurement methods
- Dosimetry for reactor characterization & reactor physics
- Benchmarks and Intercomparisons
- Dosimetry for research reactors & accelerators
- Fusion & high energy neutron dosimetry
- Adjustment methods and uncertainty quantification

The Symposium is organized into oral and poster presentations, a tutorial, and round-table workshops. The meeting language is English.

Mary Helen Sparks, Symposium Co-Chair, ASTM
Jan Wagemans, Symposium Co-Chair, EWGRD
Russell Depriest, Symposium Program Chair, ASTM
Dave Vehar, Scientific Secretary, ASTM
Joshua Daniel, Program Secretary, ASTM
Dean Thornton, Programme Secretary, EWGRD



16th ISRD - Preliminary Schedule

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	
8:00						8:00 Oral 7 (4): Reactor Surveillance II	8:00
9:00		8:30 Opening & Keynote (2)	8:00 Oral 3 (7): Adjustments, Intercomparisons & Benchmarks	8:00 Oral 5 (6): Transport Methods	8:00 Oral 6 (6): Reactor Surveillance I	9:20 Break (20m)	9:00
10:00		10:00 Break (20m)		10:00 Break (20m)	10:00 Break (20m)	9:40 Workshop Summaries (6) & Symposium Closing	10:00
11:00		10:20 Oral 1 (6): Research Reactors	10:20 Break & Poster A	10:20 Workshop B: Transport/ Benchmarks; Mixed Field	10:20 Poster B	11:00 Adjournment	11:00
12:00							12:00
13:00		12:20 Lunch	12:20 Lunch		12:20 Lunch		13:00
14:00		13:40 Oral 2 (6): Nuclear Data	13:40 Oral 4 (5): Experimental Techniques	13:30 Optional Activities	13:40 Workshop C: Reactor Surveillance; Experimental Techniques		14:00
15:00			15:20 Break (20m)		15:40 Break (20m)		15:00
16:00		15:40 Break (20m)	15:40 Workshop A: Adj, CS, UQ; Research Reactors			16:00 Joint ASTM-EWGRD Committee Meeting	
17:00	17:00 Registration (continues through Monday)	16:00 Tutorial		17:00 to 20:00 Museum & Dinner			17:00
18:00			18:00 ASTM & EWGRD Committee Meetings				
19:00	19:00 Reception (Margueritas, Wine & Southwestern Snacks)				19:00 Banquet		19:00
20:00							20:00

Included for attendees with paid registration

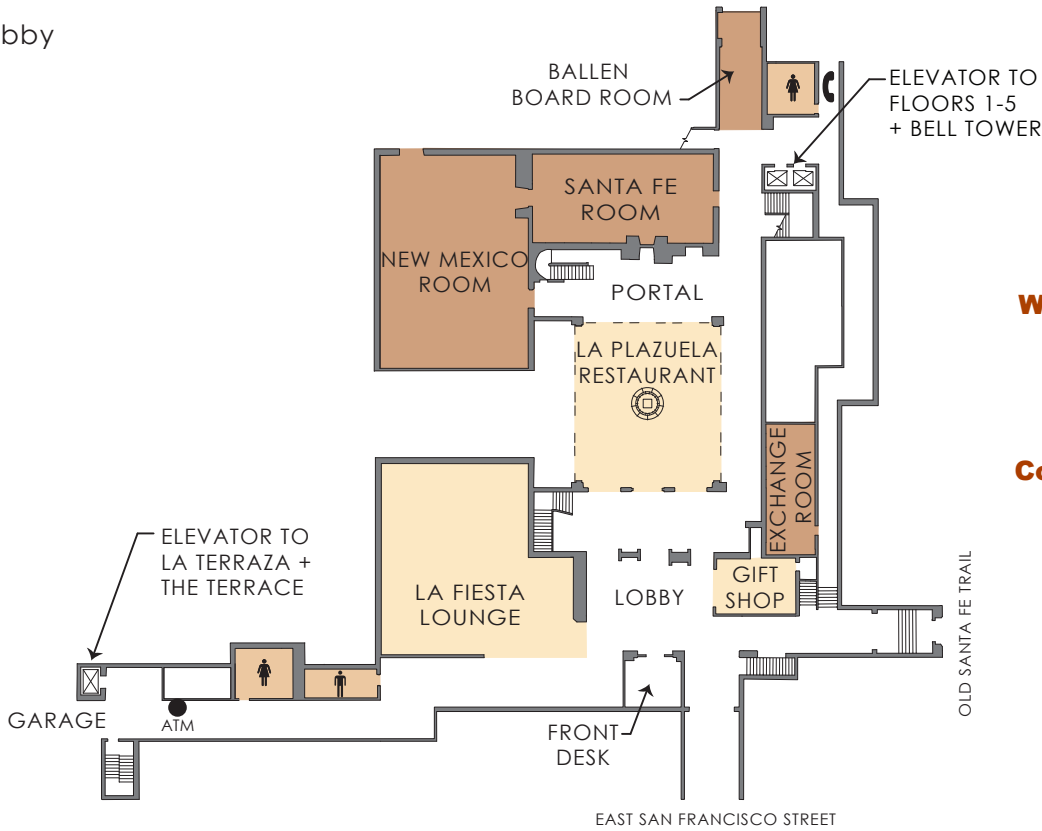
First Floor



La Fonda
On the Plaza™

100 E. San Francisco Street
Santa Fe, New Mexico 87501

Lobby



Workshops:

- Exchange Room**
- New Mexico Room**
- Santa Fe Room**

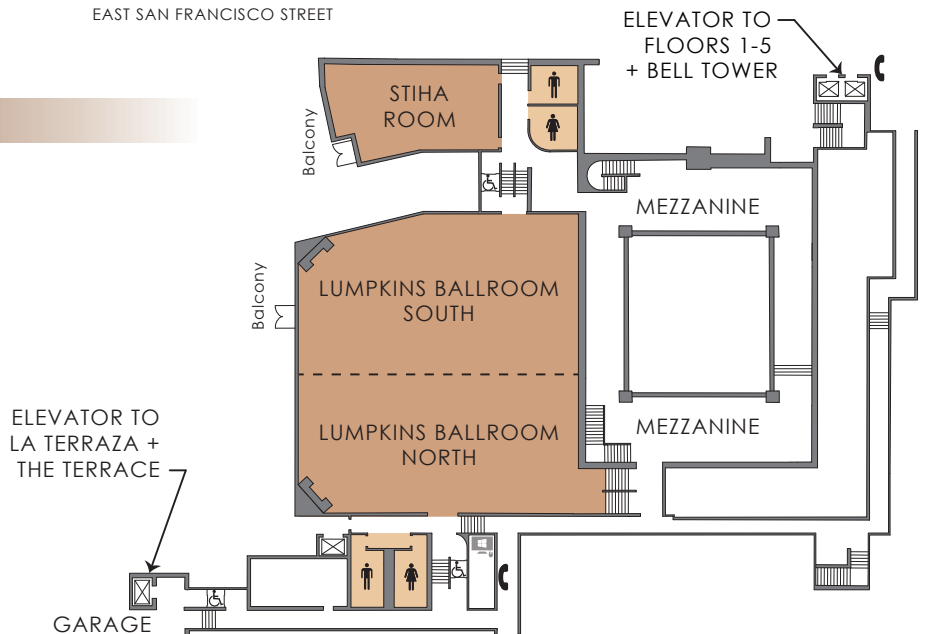
Committee Meetings:

- Exchange Room**
- Ballen Boardroom**

Second Floor

Mezzanine & Ballroom

- Administration:**
Stiha Room
- Oral Sessions:**
Lumpkins Ballroom
- Poster Sessions:**
Mezzanine



Third Floor

La Terraza



- Reception:**
La Terraza

Non-Technical Activities

Please join us Wednesday evening at the **Museum of International Folk Art (MOIFA)**, located on Museum Hill. A Santa Fe treasure, the Museum was founded by Florence Dibell Bartlett, a Chicago heiress who donated her collection and properties to the State of New Mexico. Ms. Bartlett believed that Folk Art, as a visual language, can unite people from all over the world. The Museum's collection now represents over 100 countries and some of the finest global cultural traditions.

The Girard gallery, the main exhibit at MOIFA, will be open to Symposium attendees from 5pm to 8pm on Wednesday evening. Docent tours will be conducted from 5pm to 6pm, or you may explore the gallery on your own. This will be followed by drinks and a contemporary New Mexican dinner catered by the **Museum Hill Cafe**. Admission to this event is included in your Symposium registration. Cost for companions who wish to participate is \$75. Photography is permitted throughout MOIFA unless restricted for a specific exhibit.

- A special workshop related to the museum exhibits will be offered to Symposium attendees and companions. This will begin with a docent tour of the amulet and talisman exhibit from 2pm to 3pm, followed by a hands-on session from 3pm-5pm. The cost for this is \$15. Space is limited.
- All of MOIFA galleries are open to Symposium attendees and companions during the hours of 2pm to 5pm on Wednesday. The general public admission fee will be waived during these hours upon presentation of your Symposium name badge. As "**Museum Members**" for the day, you are also entitled to a 10% discount at the Museum Shop.

Transportation from La Fonda to MOIFA will be provided, starting around 1:30pm and returning to the hotel between 8pm and 9pm. This will provide you with an opportunity to visit some of the other locations of interest adjacent to MOIFA. Costs for these are not included in the Symposium registration, but are nominal:

- MOIFA is open to the public from 10am to 5pm. All of its galleries can be explored during these hours, if you would like a more comprehensive visit. The MOIFA shop will be open during this time, but will close at 5pm for the Symposium activities.
- Immediately adjacent to MOIFA are the **Museum of Indian Arts and Culture** and the **Santa Fe Botanical Garden**. A short walk gets you to the **Wheelwright Museum of the American Indian**.

For those who prefer an outdoor activity, there are several options. Please be aware that Santa Fe is high desert, with an altitude of 7200 ft (2200 m). Be sure to drink and carry plenty of water, wear appropriate clothing, and be generous with your sunscreen.

- Quality bicycles are available for rent from **Mello Velo**, located a few blocks from La Fonda. Arrangements must be made directly with the shop. Note: La Fonda can provide bicycle storage for attendees who want to make an extended rental arrangement with Mello Velo during the Symposium. Two bicycle trails to consider are **Dale Ball Trail** and **La Tierra Trail**, both within three miles of La Fonda. See also **Santa Fe Trails**.
- There are many hiking trails in the Santa Fe area, but again look at the Dale Ball and La Tierra Trails.

However you choose to spend your time on Wednesday afternoon, be sure to be back at MOIFA for the social by 5pm, and bring your camera for one of the best sunset views in Santa Fe.

Keynotes

The Advanced Test Reactor: A Bright Irradiation Future

Dr. Sean O’Kelly
Idaho National Laboratories (USA)

The Advanced Test Reactor (ATR) at the Idaho National Laboratory (INL) has operated for 50 years to provide reactor irradiation testing of nuclear fuels and materials. The unique design of the ATR includes core locations that permit irradiation testing in large volume prototypic environments but has also contributed to ATR’s long operating life. The Department of Energy is currently funding an upgrade and refurbishment strategy that will allow the ATR to operate and reliably support national and international irradiation research programs beyond 2050. This presentation will discuss ATR experimental capabilities, some recent and planned material irradiation research, the ATR age management strategy, and ongoing efforts at INL to computationally model irradiation damage of nuclear materials.

Bio: Dr. Sean O’Kelly is currently the INL Associate Laboratory Director responsible for the ATR programs. He has managed and operated nuclear reactors for over 30 years. Prior to coming to INL he was the Deputy Director for the NIST Center for Neutron Research. He received his Ph.D. from the University of Texas at Austin and his M.S. and B.S. from Texas A&M University.

Radiation Detectors and Imaging Technologies

Dr. Cinzia Da Vià
University of Manchester (UK)

The keynote address will discuss how the development of radiation instrumentation has been crucial for fundamental scientific discoveries and for the improvement of human life. After a brief historic introduction, there will be an overview of some of the modern technologies used in radiation imagers in various fields followed by potential future trends.

Bio: Cinzia Da Vià is a Professor of Physics at the University of Manchester UK, she received her PhD at Glasgow University in 1998 and is an expert in radiation detectors for High-Energy Physics and Medical applications. She has been working on radiation hard silicon detector development for the Large Hadron Collider (LHC) since 1998 and in 1995 she participated in the discussions which led to the design of 3D silicon sensors and has been working on the development of this technology ever since. She formed and led the 3D ATLAS pixel R&D Collaboration (2007-2014), which successfully designed and industrialized the first 3D sensors to be installed in an experiment. 3D sensors are operating in the ATLAS experiment since 2015. In 2010, she proposed the use of Micro-Electro-Mechanical Systems (MEMS) technology to fabricate sensors for micro-dosimetry in Hadron therapy and is currently involved in 3D printed dosimetry and vertical integration of smart-systems. She is in the scientific committee of several international conferences on Radiation Detectors and Instrumentation and is the co-founder of the ERDIT (European Radiation Detector and Imaging Technology) Network to promote Radiation Imaging Technology research across different fields of application in Europe. Part of NPSS TNC representing the United Kingdom, she will be the NSS Chair at the NSS-MIC Conference in 2019 and since 2015 she is an elected member of the NPSS RISC Committee.

The Advanced Test Reactor: A Bright Irradiation Future

Keith Penny

Idaho National Laboratories (USA)

Keith Penny obtained his B.S in Nuclear Engineering at the University of Tennessee. He has over 33 years of nuclear reactor experience and has operated and/or managed 7 different DOE Test Reactors including the Advanced Test Reactor (ATR) and the High Flux Isotope Reactor (HFIR). In 1988 Keith was the Operations Manager of the High Flux Isotope Reactor, Oak Ridge Tennessee and played a significant role in the reactor restart after a DOE directed shutdown. In 1991 he returned to Idaho and became a System Engineer / Safety Analyst for the ATR Reactor and Experiments. In 1996 he became the manager for ATR Construction Projects as well as the Manager for the ATR Experiment Engineering group. He was an integral part of the development and implementation of the ATR Upgraded Final Safety Analyses Report. In 2001 Keith became the ATR Plant Engineering Manager, and in 2003, the ATR Complex Engineering Manager. In that role, he developed, implemented, and managed the ATR Design Bases Reconstitution Program and successfully led the ATR complex through a DOE initiated shutdown of the ATR. Later in 2011, Keith became the Manager of the INL Research Experiment Design and Analysis group and in 2012, the Deputy Director of the Material and Fuels Complex (MFC) Research Division. In 2014 Keith took on the restart of the Transient Reactor Test (TREAT) Facility and was the plant manager before finally moving back to ATR in 2015 as the Chief Operating Officer ATR.

ISRD-16 Program Schedule

Sunday, May 7th

5:00 pm – 9:00 pm: Registration

7:00 pm – 9:00 pm: Reception

Monday, May 8th

8:30 am – 10:00 am Welcome and Keynote Presentations

Chairs: Mary Helen Sparks (ASTM International) and Jan Wagemans (EWGRD)

8:30 am: Welcome and Announcements

8:40 am: The Advanced Test Reactor: A Bright Irradiation Future
Keith Penny – Idaho National Laboratories (USA)

9:20 am: State of the Art of Radiation Detectors: Imaging What You Cannot See
Dr. Cinzia DaVia – University of Manchester (UK)

10:00 am – 10:20 am Break

10:20 am – 12:20 pm Oral Session 1 – Research/Test Reactor and Accelerator Dosimetry

Chairs: Joel Kulesza and Pavel Frajtag

101: A Methodology for Harvesting and Predicting Isotope Production at the Advanced Test Reactor
J. Navarro – Idaho National Laboratory

102: Design of Separated Element Reflector Experiments in CROCUS: PETALE
V. Lamirand – École Polytechnique Fédérale de Lausanne (EPFL)

103: Radiation Spectra and Dose Comparisons Utilizing Monte Carlo N-Particle 6 (MCNP6) and Fast Burst Reactor Source Measurements
A. W. Decker – Nuclear Science and Engineering Research Center (NSERC)

104: Shielding and Activation Studies for the MYRRHA Research Reactor
S. E. Mueller – Helmholtz-Zentrum Dresden-Rossendorf (HZDR)

105: Neutron and Gamma-Ray Radiation Environments for the Central Cavity in the Annular Core Research Reactor
E. J. Parma – Sandia National Laboratories

12:20 pm – 1:40 pm Lunch

1:40 pm – 3:40 pm Oral Session 2 – Cross Sections, Nuclear Data, and Uncertainties

Chairs: Jorge Navarro and Christophe Destouche

201: 2016 Review of Neutron and Non-Neutron Nuclear Data
N. E. Holden – Brookhaven National Laboratory

202: Results of a New Evaluation of the Neutron Standards
A. D. Carlson – National Institute of Standards and Technology

203: Assessment of Novel Techniques for Nuclear Data Evaluation
P. Helgesson – Uppsala University

204: Prediction of Spectrum Averaged Cross Section in Prompt Fission Neutron Fields
R. Capote – International Atomic Energy Agency

205: Rigorous Uncertainty Propagation Using a Dosimetry Transfer Calibration
P. J. Griffin – Sandia National Laboratories

3:40 pm – 4:00 pm Break

4:00 pm – 6:00 pm Tutorial: Shedding Light on Evaluated Nuclear Data Uncertainties
Denise Neudecker (Los Alamos National Laboratory)

Tuesday, May 9th

8:00 am – 10:20 am Oral Session 3 – Adjustments, Inter-comparisons, & Benchmarks

Chairs: Bojan Petrovic and Vladimar Smutney

- 301: Enhancement of STAYSL PNNL with IRDFF to 60 MeV
L. R. Greenwood – Pacific Northwest National Laboratory
- 302: Numerical Experiment to Validate an Advanced Methodology for Dosimetry in French Nuclear Reactors
N. Thiollay – CEA Cadarache
- 303: The VENUS-F Reactor for Nuclear Data Validation
J. Wagemans – Belgian Nuclear Research Centre
- 304: Analysis of the FLUOLE-2 Program: UOX/MOX Core Loading Configurations
S. Bourganel – DEN/DANS/DM2S/SERMA/LPEC
- 305: On the Influence of Biological Shielding on Neutron Flux Behind Reactor Pressure Vessel
M. Košťál – Research Center Rez LTD
- 306: The GRUPINT Neutron Spectrum Adjustment Code – General Features and Characterization of the Spectra in Three Irradiation Channels of the JSI TRIGA Reactor
A. Trkov – Jožef Stefan Institute
- 307: LR-0 Reactor Measurements for Estimation of Material Degradation of WWER-1000 Baffle
D. Harutyunyan – Czech Technical University in Prague

10:20 am Break

10:20 am – 12:20 pm Poster Session A

**Cross Sections, Nuclear Data, and Uncertainties
Transport Calculations (n/γ) and Modeling
Adjustments, Inter-comparisons, & Benchmarks**

Chairs: Cable Kurwitz and Mladen Mitev

- PA1: Fission Observables from Langevin Equation Using Microscopic Transport Coefficients
M. D. Usang – Tokyo Institute of Technology
- PA2: An Electronic Interactive System (Database) for Nuclides/Isotopes in Everyday Applications
N. E. Holden – Brookhaven National Laboratory

- PA3: Nuclear Decay Data for the International Reactor Dosimetry Library for Fission and Fusion (IRDFF): Updated Evaluations of the Half-Lives and Gamma Ray Intensities. Part 2
V. P. Chechev – V. G. Khlopin Radium Institute
- PA4: Presentation of the CALMAR-ECORCES Spectrum Adjustment Package Available at the NEA Data Bank
G. Grégoire – CEA Cadarache
- PA5: Evaluation of the $^{23}\text{Na}(n, \gamma)$ Reaction Cross-Section
K. I. Zolotarev – Institute of Physics and Power Engineering
- PA6: FISPACT-II & TENDL-2015: Dosimetry with Uncertainty Quantification and Propagation
J-Ch. Sublet – United Kingdom Atomic Energy Authority
- PA7: Co-60 Filter Box Optimization
K. Russell DePriest – Sandia National Laboratories
- PA8: Uncertainty Quantification of Fluence Calculations in Advanced Graphite Creep Experiments
V. K. Patel – Idaho National Laboratory
- PA9: Examination of Core Neutronic Data Generated with the CASL Tools and Impacts on Dosimetry Analysis
G. A. Fischer – Westinghouse Electric Company LLC
- PA10: Comparison of Fuel Depletion Model and Fresh Fuel Model in Neutron Transport Calculation for HANARO Application to Neutron Transmutation Doping
M. Kim – Korea Atomic Energy Research Institute
- PA11: Experimental and Computational Validation of RAPID
N. Roskoff – Virginia Polytechnic Institute and State University (Virginia Tech)
- PA12: RAPID for Monitoring of Nuclear Reactor Systems
M. Wang – Virginia Polytechnic Institute and State University (Virginia Tech)
- PA13: Design of a Shielded CHANDLER for Remote Detection of Pu Content of a Nuclear Reactor
A. Haghghat – Virginia Polytechnic Institute and State University (Virginia Tech)
- PA14: Assessing Pathways of Tritium Production in a Detailed FHR Model
T. Flaspoebler – Georgia Institute of Technology (Georgia Tech)
- PA15: Methodology Qualification for the 3-D RAPTOR-M3G Discrete Ordinates Transport Code
J. Chen – Westinghouse Electric Company LLC

- PA16: Comparative Study between RAPTOR-M3G and TORT for Commercial Pressurized Water Reactor
J. Chen – Westinghouse Electric Company LLC
- PA17: Verification and Validation of Monte Carlo N-Particle 6 (MCNP6) for Evaluating Shielding Materials Against Gamma Radiation
W. J. Erwin – Air Force Institute of Technology
- PA18: Modeling Prompt Gamma Spectra at Varying Distances from an Unshielded Fast Fission Reactor
W. J. Erwin – Air Force Institute of Technology
- PA19: Dosimetric Analysis of Radiation and Shielding Code cosSHIELD in Primary Shielding Design of AP1000
Y. Hu – State Power Investment Corporation Research Institute
- PA21: Fast Neutron Flux and DPA Rates in NuScale SMR Core Components and Vessels
W. Zhang – NuScale Power LLC
- PA22: Validation of the Reactor Power by Means of AMS for Fluence Calculations in Reactor Pressure Vessel
J. Konheiser – Helmholtz-Zentrum Dresden-Rossendorf
- PA23: Monte Carlo Calculation Procedure and Its Implementation for Radiation Load Estimation on Russian VVER Reactor Equipment
J. Konheiser – Helmholtz-Zentrum Dresden-Rossendorf
- PA24: Innovative Irradiation Facility for the Production of ^{166}Ho Microspheres to Treat Liver Cancer
T. Yao – Delft University of Technology
- PA25: Recent Developments in the Tripoli-4[®] Monte-Carlo Code for Reactor Dosimetry and Nuclear Instrumentation Applications
F. Malouch – CEA
- PA26: Uncertainty Quantification of GenSpec: A Genetic Algorithm for Neutron Energy Spectrum Adjustment
D. R. Redhouse – Sandia National Laboratories
- PA27: Neutron Spectrum Characterization at the Annular Core Research Reactor Using a Genetic Algorithm for Spectrum Adjustment
R. M. Vega – Sandia National Laboratories
- PA28: Re-Analyses of the European HCLL and HCPB Breeder Blanket Mock-up Neutronics Experiments with State-of-the-Art Nuclear Data Libraries
A. Klix – Karlsruhe Institute of Technology

PA29: Using Total Monte Carlo to Calculate the Full Covariance Matrix of a Neutron Spectrum
N. L. Asquith – NRG Petten

12:20 pm – 1:40 pm Lunch

1:40 pm – 3:20 pm Oral Session 4 – Experimental Techniques

Chairs: Greg Fischer and Abdallah Lyoussi

401: Design and Response Testing of Boron-Implanted/Diffused Silicon Carbide Neutron Detectors for Dosimetry and Monitoring Applications
K. C. Mandal – University of South Carolina

402: Practical Considerations for Reactor Spectrum Characterization: Lessons Learned
T. Quirk – Sandia National Laboratories

403: Determination of ^{103m}Rh X-ray Emission Intensities for Reactor Dosimetry
J. Riffaud – CEA Saclay

404: Exploration of the 1 keV – 1 MeV Neutron Energy Range Using Zirconium Dosimeters
N. Thiollay – CEA Cadarache

405: Simultaneous Measurements of Nuclear Heating and Thermal Neutron Flux Obtained with the CALMOS-2 Measurement Device inside the OSIRIS Reactor
H. Carcreff – CEA Saclay

3:20 pm – 3:40 pm Break

3:40 pm – 5:40 pm Workshop Session A

Adjustment Methods, Cross Sections, and Uncertainty Quantifications

Chairs: Patrick Griffin and Dean Thornton

Test and Research Reactors

Chairs: Michael Flanders and Pavel Frajtag

6:00 pm – 7:30 pm ASTM & EWGRD Committee Meetings

Wednesday, May 10th

8:00 am – 10:00 am Oral Session 5 – Transport Calculations (n/γ) and Modeling

Chairs: Ed Parma and Joerg Konheiser

501: Methodology to Consider Load Following in Fast Neutron Fluence on RPV Calculations
C. A. Gosmain – EDF R&D

502: Evaluation of the Pool Critical Assembly Benchmark with Explicitly Modeled Geometry
Using MCNP6's Unstructured Mesh Capabilities
J. A. Kulesza – University of Michigan

503: Deterministic Model of PWR Fast Fluence for Uncertainty Propagations with the Code
APOLLO3®
P. Mosca – DEN/DANS/DM2S/SERMA/LLPR

504: Derivation of Ex-Core Detector Response Functions for Sizewell B
C. Murphy – Amec Foster Wheeler

505: High-Fidelity Gamma Transport Analysis for the Advanced Test Reactor Fuel Storage
Canal
D. W. Nigg – Idaho National Laboratory

506: A Case Study into the Effect of Excess Reactivity on the Results of Dosimetry Calculations
Performed with Fixed Source Codes
D. J. Powney – Amec Foster Wheeler

10:00 am – 10:20 am Break

10:20 am – 12:20 pm Workshop Session B

Transport Methods and Benchmarks

Chairs: Igor Remec and Vladimir Smutney

Mixed Field Dosimetry

Chairs: J. Chen and Vit Klupak

1:30 pm – 5:00 pm Optional Activities

5:00 pm – 8:00 pm Museum & Dinner

Thursday, May 11th

8:00 am – 10:00 am Oral Session 6 – Reactor Surveillance & Plant Life Extension - I

Chairs: Benjamin Parks and Dean Thornton

- 601: Neutron Fluence Monitoring for Subsequent License Renewal
M. Hardgrove – U. S. Nuclear Regulatory Commission
- 602: Retrospective Dosimetry Analysis of Top Support Plug Samples from Scrap Surveillance Capsule Material for Qualifying Calculations in the Extended Beltline Region of PWRs
G. A. Fischer – Westinghouse Electric Company LLC
- 603: Additional Surveillance Program for VVER-1000 Reactors at Ukrainian NPPs
O. V. Grytsenko – Institute for Nuclear Research
- 604: Implementation of Ex-Vessel Neutron Dosimetry for Advanced Power Reactor, APR-1400 in Korea
M. Lim – Korea Reactor Integrity Surveillance Technology
- 605: Approaches for Estimation of Radiation Damage Parameters on VVER Equipment and Their Implementation During Monitoring Procedure
P. Borodkin – Scientific and Engineering Centre for Nuclear and Radiation Safety
- 606: An Assessment of DPA as an Alternative Damage Correlation Parameter for Reactor Pressure Vessel Embrittlement
R. E. Stoller – Oak Ridge National Laboratory (Retired)

10:00 am – 10:20 am Break

10:20 am – 12:20 pm Poster Session B

**Research/Test Reactor and Accelerator Dosimetry
Reactor Surveillance & Plant Life Extension
Experimental Techniques**

Chairs: Cable Kurwitz and Mladen Mitev

- PB1: Characterization of the Annular Core Research Reactor (ACRR) Neutron Radiography Experiment Region
K. I. Kaiser – Sandia National Laboratories
- PB2: Calculations of Neutron and Gamma Doses on the Beryllium Reflector for the Advanced Test Reactor Using MCNP5
D. O. Choe – Idaho National Laboratory

- PB3: Detailed Measurement of Neutron Background Flux in the Advanced Test Reactor Fuel Storage Canal
D. W. Nigg – Idaho National Laboratory
- PB4: Performance Verification Testing of Ex-Core Neutron Flux Monitoring System for Commercial Reactor Using UCI TRIGA Reactor
S. Yang – Korea Atomic Energy Research Institute
- PB5: Neutronics Analyses for the SNS Second Target Station
I. Remec – Oak Ridge National Laboratory
- PB6: Modeling the White Sands Missile Range Fast Burst Reactor with a Discrete Ordinates Code, PENTRAN
T. R. Schulmeister – Air Force Institute of Technology
- PB7: 1-MeV Equivalent Silicon Damage Studies at the White Sands Missile Range Fast Burst Reactor
T. M. Flanders – White Sands Missile Range
- PB9: Neutron Energy Spectrum Measurement at the Tangential Channel No.3 of the Dalat Reactor
N. C. Hai – Dalat Nuclear Research Institute
- PB10: Installation of a Second CLICIT Irradiation Facility at the Oregon State TRIGA Reactor
R. A. Schickler – Oregon State University
- PB11: Experiment-based and Numerical Estimation Analysis of Neutron Field Performance in the In-Core Irradiation Positions and in the Lateral Blanket of the BOR-60 Reactor
E. E. Lebedeva – JSC SSC RIAR
- PB12: Study of Epithermal-Neutron Spectrum Variation Versus Depth in Water Phantom
G. Gambarini – Università degli Studi di Milano, Italy
- PB13: Supplemental Surveillance Capsule Application for Optimized Power Reactor, OPR1000 in Korea
Y. Maeng – Korea Reactor Integrity Surveillance Technology
- PB14: Determination of the Exposure Conditions of the VVER-1000 Supporting Elements
V. L. Diemokhin – Institute of Nuclear Research
- PB15: Advanced Neutron Dosimetry on VVER-440 Aimed to Reactor Equipment Load Evaluation During Life Time Prolongation
P. Borodkin – Scientific and Engineering Centre for Nuclear and Radiation Safety

- PB16: Establishment of CORONA Academy as Common Source of Knowledge in the Area of VVER Technology
M. Mitev – Institute for Nuclear Research and Nuclear Energy, Bulgarian Academy of Sciences
- PB17: Performance of Serpent in Plant Life Management Calculations
T. Viitanen – VTT Technical Research Centre of Finland
- PB18: First Results of the Evaluation of a Series of Calculations and Neutron Monitor Irradiations in the Reactor Cavity of the Hungarian NPP
E. M. Zsolnay - Budapest University of Technology and Economics
- PB19: Automated Fast Fluence Calculations Implementation Within Arcadia® Code System
C. M. Morichau Beauchant – AREVA NP
- PB20: Reactor Dosimetry and Uncertainty Quantification in Support of the Advanced Graphite Creep (AGC) Experiments
P. W. Humrickhouse – Idaho National Laboratory
- PB21: Neutron Dosimetry Realized by Intrinsic Neutron Sensitivity of GaN Schottky Devices
L. R. Cao – The Ohio State University
- PB22: Gamma-Ray Imaging System for Fukushima Daiichi Nuclear Power Plant Using Silicon Strip Detector
M. Kaburagi – Japan Atomic Energy Agency
- PB23: R&Ds on Radiation Measurements in JAEA Towards the Decommissioning of Fukushima Daiichi Nuclear Power Plant
Y. Sato – Japan Atomic Energy Agency
- PB24: The Effects of Radiation Hardening and Thermal Annealing on the Reusability of Mn:CaF₂ TLDs
J. D. Daniel – White Sands Missile Range
- PB25: Fast Two Parametric Spectrometric System for Experimental Reactor Dosimetry
Z. Matěj – Masaryk University
- PB26: New Evaluation of Neutron Fluence Measurements by Diamond Detectors
V. A. Nikolaenko – National Research Center – Kurchatov Institute
- PB27: Detection Instrumentation of the CROCUS Reactor
V. Lamirand – Ecole Polytechnique Fédérale de Lausanne (EPFL)
- PB28: Testing of the Retrospective Dosimetry Procedure Based on the Extraction of Niobium from VVER-1000 Cladding Material Samples after Their Irradiation in Research Reactor
V. N. Kochkin - National Research Center – Kurchatov Institute

12:20 pm – 1:40 pm Lunch

1:40 pm – 3:40 pm Workshop Session C

Reactor Surveillance

Chairs: G. A. Fischer and Simon Shaw

Experimental Techniques

Chairs: Lawrence Greenwood and Hubert Carcreff

3:40 pm – 4:00 pm Break

4:00 pm – 6:00 pm Joint ASTM – EWGRD Committee Meeting

7:00 pm Symposium Banquet

Friday, May 12th

8:00 am – 9:20 am Oral Session 7 – Reactor Surveillance & Plant Life Extension - II

Chairs: MiJoung Lim and Sergey Zaritsky

- 701: Radiation Induced Degradation of Concrete in NPPs
I. Remec – Oak Ridge National Laboratory
- 702: Validation of MCBEND Dosimetry Predictions Against Measurements from Hunterston B
Advanced Gas-Cooled Reactor
D. A. Allen – Amec Foster Wheeler
- 703: Vanadium Self-Powered Detector Gamma Response in Commercial Pressurized Water
Reactor
J. Chen – Westinghouse Electric Company LLC
- 704: LWR Surveillance Dosimetry at Sizewell B Nuclear Power Plant
S. E. Shaw – EDF Energy Generation Ltd.

9:20 am – 9:40 am Break

9:40 am – 11:00 am Symposium Closing Session

9:40 am: Workshop Summaries
Chairs: Igor Remec and Dean Thornton

10:10 am: Closing Remarks and Announcements
Chairs: Mary Helen Sparks (ASTM International) and Jan Wagemans (EWGRD)

11:00 am Symposium Adjournment