



Hyatt Regency Atlanta



AMERICAN NUCLEAR SOCIETY 2013 ANNUAL MEETING



*"Next Generation Nuclear Energy:
Prospects and Challenges"*

**Register Now! www.ans.org
Preliminary Program**



Atlanta, Georgia • June 16-20, 2013



Our most sincere thanks
to the following contributors
for their support of the

2013 ANS ANNUAL MEETING

"Next Generation Nuclear Energy: Prospects and Challenges"

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Thank You!



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"Next Generation Nuclear Energy: Prospects and Challenges"



SATURDAY, JUNE 15, 2013

8:00 a.m. - 5:00 p.m. Teachers' Workshop

SUNDAY, JUNE 16, 2013

8:00 a.m. - 5:00 p.m. Professional Development Workshop "Preparing for the Nuclear Engineering Professional Engineering Exam"

1:00 p.m. - 1:30 p.m. First-Time Attendee Orientation

4:00 p.m. - 5:00 p.m. Student Assistant Training Session

5:00 p.m. - 6:00 p.m. Mentoring Program

6:00 p.m. - 7:30 p.m. President's Reception

MONDAY, JUNE 17, 2013

8:00 a.m. - 10:00 a.m. Spouse/Guest Hospitality

8:00 a.m.-11:30 a.m. *Opening Plenary: Next Generation Nuclear Energy: Prospects and Challenges

1:00 p.m. - 4:00 p.m. 2013 ANS Meeting: Technical Sessions

6:00 p.m. - 10:30 p.m. Dinner at the High Museum of Art

TUESDAY, JUNE 18, 2013

8:00 a.m. - 10:00 a.m. Spouse/Guest Hospitality

8:30 a.m.-11:30 a.m. 2013 ANS Meeting: Technical Sessions

1:00 p.m. - 4:00 p.m. 2013 ANS Meeting: Technical Sessions

WEDNESDAY, JUNE 19, 2013

8:00 a.m. - 10:00 a.m. Spouse/Guest Hospitality

8:30 a.m.-11:30 a.m. 2013 ANS Meeting: Technical Sessions

1:00 p.m. - 4:00 p.m. 2013 ANS Meeting: Technical Sessions

4:30 p.m. - 6:30 p.m. Focus on Communications Workshop

7:00 p.m. Dinner Theater at Agatha's

THURSDAY, JUNE 20, 2013

8:30 a.m.-11:30 a.m. 2013 ANS Meeting: Technical Sessions

1:00 p.m. - 4:00 p.m. 2013 ANS Meeting: Technical Sessions



2013 ANS Annual Meeting: Meeting Officials



GENERAL CHAIR:
Stephen Kuczynski
Southern Nuclear Company



TECHNICAL PROGRAM CHAIR:
Sedat Goluoglu
University of Florida



ASSISTANT PROGRAM CHAIR:
Mark D. DeHart
Idaho National Laboratory



ASSISTANT PROGRAM CHAIR:
Jeff Brault
Shaw Group

FINANCE CHAIR:
Kelly Jordan
University of Florida



STUDENT PROGRAM CO-CHAIR:
Madison Martin



STUDENT PROGRAM CO-CHAIR:
Alyse Scurlock



**SPECIAL EVENTS AND
FLORIDA LOCAL SECTION CHAIR:**
Katherin L. Goluoglu

SPOUSE/GUEST PROGRAM CHAIR:
Pingchien Neo
University of Florida



MEETING INFORMATION

The 2013 ANS Annual Meeting will be held June 16-20, 2013, in Atlanta, GA. There will be a Professional Development Workshop: "Preparing for the Nuclear Engineering Professional Engineering Exam" held in conjunction with the 2013 ANS Annual Meeting.

ACCOMMODATIONS/HOTEL INFORMATION

The Hyatt Regency Atlanta will be the location for the 2013 ANS Annual Meeting, where all activities, technical sessions and governance committee meetings will take place.

The Hyatt Regency Atlanta Hotel is located at 265 Peachtree Street, NE, Atlanta, Georgia, 30303.

The special room rate for the meeting is: \$199.00/night (single/double rate). To take advantage of this reduced rate, reservations must be made by May 24, 2013.

Reservations can be made online: https://resweb.passkey.com/Resweb.do?mode=welcome_ei_new&eventID=9879813

To register by phone for a guest room: 800-233-1234

Message to Attendees:

ANS has made every effort to secure the best possible nightly room rate for you at the Hyatt Regency Atlanta. That rate results from a negotiated overall package of event needs such as sleeping rooms, meeting room space and other requirements. Event costs will increase if ANS falls short of its minimum room block guarantee.

Please help ANS keep the costs of this event as low as possible by booking your housing needs at the designated host hotel and through the reservation process created by ANS. Reserving your rooms elsewhere means you are booking outside the contracted room block, jeopardizing ANS' ability to meet its contracted obligations and to keep registration fees to a minimum. ANS appreciates your support and understanding of this important issue. Thank you!

FIRST-TIME ATTENDEE ORIENTATION

The ANS Membership Committee will offer an orientation session for first-time ANS meeting attendees.

Learn what goes on at national meetings, how the national organization works, and how to get involved at the national and local levels.

Whether you are a member or not, student or professional, if this is your first ANS national meeting, the Membership Committee invites you to attend this session, which will be held 1:00 - 1:30 p.m. on Sunday, June 16, 2013, in Hanover G.

STUDENT ASSISTANT PROGRAM

Attendance at the 2013 ANS Annual Meeting is an exciting professional opportunity for college and graduate students.

To help defray travel and living expenses, students can sign up to work as session chairs' assistants. Student assistants must attend the student training session on Sunday, June 16, 2013, 4:00 - 5:00 p.m. in Hanover G.

Student assistants receive free meeting registration and a copy of the meeting TRANSACTIONS.

All students are responsible for paying their own room, tax, and incidentals. Please refer to the ANS website for more information about the meeting.

ANS student members who register for the meeting and/or work as session chairs' assistants should pick up a travel assistance form which can be found in the student headquarters room. Student travel assistance is provided through contributions from the ANS professional divisions.

The student headquarters room will be located in Chicago D.

MENTORING PROGRAM

A special mentoring program will be held from 5:00 p.m. - 6:00 p.m. on Sunday, June 16, 2013, in the Hanover G.

ANS Members who will serve as mentors hold a variety of positions within the Society, serving on governance committees and working within the divisions. The mentors encompass a wide range of careers and technical specialties, all of which they hope to share with first-time attendees, student members, new members and those seeking career advancement and networking opportunities.

WORKSHOP FOR SCIENCE EDUCATORS

A workshop for science educators will be held on Saturday, June 15, 2013, 8:00 a.m. - 5:00 p.m.

You must contact Chuck Vincent, ANS Outreach Department, at 708-579-8311 for further details. Advance registration is required for all who wish to attend.

This workshop is supported by individual organizational contributions to the American Nuclear Society's Outreach Program and by gifts from several professional divisions of ANS.

NOTICE FOR SPEAKERS

All speakers and session chairs must sign in at the "Speakers' Desk," located in the ANS Registration Area of the hotel during registration hours. Speakers are expected to register for the meeting and pay registration fees.

CONFERENCE OFFICE

Location: Chicago E

ANS SECRETARIAT

Location: Chicago AB

ANS Registration

Meeting and workshop registration, speakers' & sessions chairs' desk and the message desk will be located at: the Permanent Registration Desk (Gold Level, West Tower) of the Hyatt Regency Atlanta, Saturday, June 15, 2013 - Thursday, June 20, 2013. Meeting registration is required for all attendees and presenters. Badges are required for admission to all technical sessions, workshops and events.

Registration Hours:

Saturday, June 15, 2013

2:00 p.m. - 5:00 p.m.

Sunday, June 16, 2013

11:00 a.m. - 7:00 p.m.

Monday, June 17, 2013

7:30 a.m. - 5:00 p.m.

Tuesday, June 18, 2013

7:30 a.m. - 5:00 p.m.

Wednesday, June 19, 2013

7:30 a.m. - 5:00 p.m.

Thursday, June 20, 2013

7:30 a.m. - 2:00 p.m.

* Sunday workshop attendees only

Registration for the Sunday ANS Professional Development Workshops will take place at the Regency Ballroom Registration Desk (Gold Level, West Tower) of the Hotel on Sunday, June 16, 2013, from 7:30 a.m. until 9:00 a.m. Please note: only workshop information will be available; all other registrants see times and location above.

ANS Media Center

Monday, June 17, 2013

7:45 a.m. - 4:00 p.m.

Tuesday, June 18, 2013

8:00 a.m. - 4:00 p.m.

Wednesday, June 19, 2013

8:00 a.m. - 4:00 p.m.

Location: Chicago C

FOCUS ON COMMUNICATIONS WORKSHOP

Wednesday, June 19, 2013 4:30p.m.- 6:30p.m.

Location: Learning Center

SPOUSE/GUEST HOSPITALITY

Spouse/guest hospitality breakfast will be served from 8:00 a.m. - 10:00 a.m., Monday, June 17, 2013, through Wednesday, June 19, 2013, in Suite 226. Continental breakfast will be served each morning.

Spouse/guest registration is required for admittance to the spouse/guest hospitality breakfast.

Spouse/guest registration includes one ticket to the president's reception and admittance to the spouse/guest breakfast only- it does not include technical sessions or other events.



ATTENTION RUNNERS: ANS FUN RUN



On Tuesday, June 18, 2013, there will be a noncompetitive run starting at 6:00 a.m. from the front entrance of the hotel.

We are looking forward to seeing you at the fun run in Atlanta, GA. Bring shoes and a big smile.

PROFESSIONAL DEVELOPMENT WORKSHOP

PLEASE NOTE: Registration for the workshop is separate from, and in addition to, the meeting registration fee.

“PREPARING FOR THE NUCLEAR ENGINEERING PROFESSIONAL ENGINEERING EXAM”

Sunday, June 16, 2013

8:00 a.m. - 5:00 p.m.

Location: Learning Center

Registration price for the workshop is \$450 for ANS members and \$550 for non-members.

This course is designed for individuals who have passed the Fundamentals of Engineering Exam (formerly the EIT exam) and who are preparing for the Professional Engineering Exam (PE exam) in Nuclear Engineering.

Instructors will provide details on registration and how it differs from state to state, plus an overview of the examination formats.

The four basic skill areas: nuclear power, nuclear fuel cycle, interaction of radiation, and nuclear criticality/kinetics/neutronics, will be discussed in detail. For each skill area, the instructor will describe the topics and the skills to be tested within each.

Examples of questions will be presented in depth, after which students will work other typical questions on their own.

Instructors will provide assistance, then review solutions with the group. Students will be provided with the revised ANS study guide including a sample exam and list of recommended resources for continued study.

EVENING EVENTS

ANS President's Reception

Sunday, June 16, 2013

6:00 p.m. - 7:30 p.m.

Location: Regency Ballroom

One ticket to the ANS President's Reception is included in the full meeting registration fee.

Additional tickets can be purchased on-site at the ANS Registration desk for \$85.

DINNER AT THE HIGH MUSEUM OF ART



Courtesy of High Museum of Art Staff

Monday, June 17, 2013

6:00 p.m. - 10:30 p.m.

Location: The Museum of High Art

The High Museum of Art is the leading art museum in the Southeastern United States. Housing a collection of classic and contemporary art, special exhibitions featuring the world's greatest art, and celebrated architecture by Richard Meier and Renzo Piano.

Tickets can be purchased on-site at the ANS Registration Desk for \$85.00 per person.



Courtesy of High Museum of Art Staff

Please Note: Buses will depart and return at the corner of Peachtree and Baker Streets, located at the right front entrance of the Hyatt Regency Atlanta Hotel. Refunds will not be given for missing the bus.

DINNER AT AGATHA'S-A TASTE OF MYSTERY



Wednesday, June 19, 2013

7:00 p.m.

Location: Agatha's-A Taste of Mystery

161 Peachtree Center Avenue, Atlanta, GA, 30303

www.agatha's.com

Dinosaurs and Divas: Murder at the Fernvault Museum

What happens when a blue-blooded Atlanta native Junior leaguer, a condescending Yankee paleontologist, and a clueless CB-radio lovin' director all work together at a high profile natural science museum? Then throw in a social media obsessed Ballet dancer, daughter of the director always on her Flitter account, and a security guard / former - teacher fired after a cheating scandal? You end up with a brew of misfits, maniacs, and, of course, murder!

Join us for a clash of underachieving egos and a night of hilarity! Watch the murder solved before your very eyes and laugh along as you play hilarious characters like the caterer of the whole event, an angry museum visitor, or even the county coroner who examined Mrs. Threadbare, the administrative assistant found stabbed in the back! Join us for a night of Murder at the Fernvault Museum!

Agatha's is located within walking distance of the hotel (one block), at 161 Peachtree Center Ave. Attendees are responsible for their own transportation to the venue

Tickets can be purchased on-site at the ANS Registration Desk for \$60.00 per person.



(Asterisks indicate special sessions. Parentheses indicate cosponsorship)

Special Sessions

*Opening Plenary: Next Generation Nuclear Energy: Prospects and Challenges, Mon. a.m. (8:00-11:30 a.m.)

Accelerator Applications (AAD)

Radiation Transport, Protection and Shielding at Accelerator Facilities, Tues. a.m.

Aerospace Nuclear Science and Technology (ANSTD)

Aerospace Nuclear Science and Technology: General, Tues. a.m.

Biology and Medicine (BMD)

(Reactor Instrumentation and Neutron Beam Instrumentation for Research Reactors, Tues. a.m.)

(Nuclear Chemistry and Radiochemistry, Tues. p.m.)

Biology and Medicine: General, Wed. a.m.

New Horizons in Medical Health Physics, Wed. p.m.

Education, Training, and Workforce Development (ETWDD)

Experiences of Women in Nuclear—Panel, Mon. p.m.

Communicating for New Nuclear Facilities—Panel, Tues. a.m.

Communicating for Science—Panel, Tues. a.m.

(Recent Developments with Nuclear Security and Safeguards, Tues. p.m.)

K-12 Outreach—I: Success Stories—Paper/Panel, Tues. p.m.

K-12 Outreach—II: Southern Company Case Study—Panel, Tues. p.m.

Training, Human Performance, and Workforce Development, Wed. a.m.

Education, Training, and Workforce Development: General, Wed. p.m.

Legacy of John D. Metzger: Nuclear Engineering Program at the University of Pittsburgh—Panel, Thurs. a.m.

Fuel Cycle and Waste Management (FCWMD)

Advanced Fuel Cycle Cost Basis Report Update, Mon. p.m.

Hybrid Energy: Combining Nuclear and Other Energy Sources, Tues. a.m.

Fuel Cycle Simulators and Systems Analysis, Tues. p.m.

Fuel Cycle and Waste Management: General—I, Wed. a.m.

Fuel Cycle and Waste Management: General—II, Wed. p.m.

Human Factors, Instrumentation, and Controls (HFICD)

New Measurement Technologies for Current and Next-Generation Reactors, Tues. p.m.

Human Factors: General, Wed. a.m.

Advances in Diagnostic and Prognostic Technologies, Wed. p.m.

Updates on Research Reactor Regulation for Instrumentation and Control Systems—Panel, Thurs. a.m.

Instrumentation and Controls: General, Thurs. p.m.

Isotopes and Radiation (IRD)

Radiation Detection for Nonproliferation Application, Mon. p.m.

Reactor Instrumentation and Neutron Beam Instrumentation for Research Reactors, Tues. a.m.

Nuclear Chemistry and Radiochemistry, Tues. p.m.

Isotopes and Radiation: General, Wed. a.m.

Materials Science and Technology (MSTD)

Advanced Measurement Techniques and Surface Techniques, Mon. p.m.

Nuclear Materials, Tues. p.m.

Nuclear Fuels, Wed. p.m.

Accident Tolerant Fuels and Advanced Fuels, Thurs. p.m.

Mathematics and Computation (MCD)

Current Issues in Computational Methods—Roundtable: Managing Modeling and Simulation Research and Innovation in an Applications-Driven Environment, Mon. p.m.

Transport and Computational Methods, Tues. p.m.

Mathematical Modeling, Uncertainty Quantification, and Sensitivity Analysis Methods, Wed. p.m.

Nuclear Criticality Safety (NCSD)

Data Analysis in Nuclear Criticality Safety—I, Tues. a.m.

Data Analysis in Nuclear Criticality Safety—II, Wed. a.m.

Nuclear Criticality Safety Standards—Forum, Thurs. a.m.

Nuclear Installations Safety (NISD)

NRC 50.54(f) Generic Letter on NNTF Recommendation 2.3, Seismic Walkdowns—Panel, Mon. p.m.

Emerging Issues in Nuclear Facility Safety, Tues. p.m.

Commercial-Grade Dedication of Real-Time Software—Panel, Wed. a.m.

Commercial-Grade Dedication of Non-Real-Time Software—Panel, Thurs. a.m.

Nuclear Installations Safety: General—I, Thurs. a.m.

Nuclear Installations Safety: General—II, Thurs. p.m.

Nuclear Non-Proliferation Technical Group (NNTG)

Managing the Spectrum of Risks in the Complexities of New Build Nuclear—Call for a New Business Model to Meet the Challenges and Opportunities in the U.S. and International Nuclear Markets—Panel, Mon. p.m.

Recent Developments with Nuclear Security and Safeguards, Tues. p.m.

Operations and Power (OPD)

The Nuclear New Build Supply Chain and Procurement Issues—Panel, Tues. a.m.

Young Blood: Integration and Retention of the Next Generation—Paper/Panel, Tues. p.m.

New Nuclear Construction Around the World—Status Report—Panel, Wed. a.m.

Advanced/Gen-IV Reactors, Wed. p.m.



Technical Sessions by Division/by Day: Monday

Small Modular Reactors: Progression and Status, Thurs. a.m.

Radiation Protection and Shielding (RPSD)

Radiation Protection and Shielding—Roundtable, Mon. p.m.

(Radiation Transport, Protection and Shielding at Accelerator Facilities, Tues. a.m.)

Computational Tools for Radiation Protection and Shielding, Tues. a.m.

Space Radiation Shielding Methods and Applications, Wed. a.m.

Radiation Protection and Shielding: General, Wed. a.m.

ADVANTG Tutorial: Automated Variance Reduction for MCNP, Thurs. a.m.

Reactor Physics (RPD)

Reactor Physics Design, Validation, and Operating Experience—I, Mon. p.m.

Reactor Physics Design, Validation, and Operating Experience—II, Tues. p.m.

Fuel Cycle Design Optimization and Analysis, Mon. p.m.

Current Issues in LWR Core Design and Reactor Engineering Support—Panel, Mon. p.m.

Reactor Physics: General—I, Tues. a.m.

Reactor Physics: General—II, Wed. p.m.

Advanced Modeling and Simulation in Reactor Physics—I, Tues a.m.

Advanced Modeling and Simulation in Reactor Physics—II, Tues p.m.

Student Research in Reactor Physics—I, Wed. a.m.

Student Research in Reactor Physics—II, Wed. p.m.

Reactor Analysis Methods—I, Wed. a.m.

Reactor Analysis Methods—II, Thurs. a.m.

Physics of Fluid-Fuel Systems—I, Thurs. a.m.

Physics of Fluid-Fuel Systems—II, Thurs. p.m.

Robotics and Remote Systems (RRSD)

Robotics and Remote Systems: General, Thurs. a.m.

Thermal Hydraulics (THD)

Computational Thermal Hydraulics—I, Mon. p.m.

General Two-Phase Flow, Tues. p.m.

Thermal Hydraulics: General, Tues. p.m.

Thermal Hydraulics in Severe Accidents, Wed. a.m.

Computational Thermal Hydraulics—II, Wed. p.m.

Thermal Hydraulics in Advanced High-Temperature Reactors, Thurs. a.m.

State of the Art in Modeling Fuel Rod Ballooning, Fuel Relocation and High Burnup Issues in LOCA Evaluation Models, Thurs. p.m.

Monday • June 17, 2013

(Asterisks indicate special sessions.)

7:30 a.m.-5:00 p.m. Meeting Registration

8:00 a.m.-10:00 a.m. Spouse/Guest Hospitality

8:00 a.m.-11:30 a.m. *Opening Plenary:
Next Generation Nuclear Energy: Prospects and Challenges

1:00 p.m.-4:00 p.m. 2013 ANS Annual Meeting
Technical Sessions

- Computational Thermal Hydraulics—I
- Managing the Spectrum of Risks in the Complexities of New Build Nuclear—Call for a New Business Model to Meet the Challenges and Opportunities in the U.S. and International Nuclear Markets—Panel
- Experiences of Women in Nuclear—Panel
- Advanced Measurement Techniques and Surface Techniques

- NRC 50.54(f) Generic Letter on NTTF Recommendation 2.3, Seismic Walkdowns—Panel
- Radiation Protection and Shielding—Roundtable
- Reactor Physics Design, Validation, and Operating Experience—I
- Fuel Cycle Design Optimization and Analysis
- Current Issues in LWR Core Design and Reactor Engineering Support—Panel
- Current Issues in Computational Methods—Roundtable: Managing Modeling and Simulation Research and Innovation in an Applications-Driven Environment
- Radiation Detection for Nonproliferation Application
- Advanced Fuel Cycle Cost Basis Report Update

3:30 p.m.-4:30 p.m. ANS Business Meeting

6:00 p.m. - 10:30 p.m. Dinner at the High Museum of Art



MONDAY, JUNE 17, 2013, 8:00 A.M.

OPENING PLENARY: NEXT GENERATION NUCLEAR ENERGY: PROSPECTS AND CHALLENGES.

Session Organizer: Stephen E. Kuczynski (*Southern Nuclear*)

SPEAKERS: to be determined

Centennial Ballroom 3/4

MONDAY, JUNE 17, 2013, 1:00 P.M.

COMPUTATIONAL THERMAL HYDRAULICS—I,

sponsored by THD.

Session Organizer: Brian G. Woods (*Oregon State Univ*)

Room: Baker

Identification of Potentially Limiting ATWS Events with Core Instability for the ABWR - Part I, Peter Yarsky (*NRC*)

Identification of Potentially Limiting ATWS Events with Core Instability for the ABWR - Part II, Peter Yarsky (*NRC*)

Steady State Thermal Hydraulic Analysis of a Molybdenum Production Element for Implementation in TRIGA® Reactors, Patrick Y. Byfield, Wade R. Marcum, Steven R. Reese (*Oregon State Univ*)

Sensitivity Analysis of a Typical Large, Dry Containment Response During a Loss of Coolant Accident Using RELAP5-3D and MELCOR, Rodolfo Vaghetto, Bradley A. Beeny, Yassin A. Hassan, Karen Vierow (*Texas A&M*)

A Creative Framework for Illustrative Visualization of Time-Varying Flows, Donna P. Guillen (*INL*)

Gas Diffusion Simulated by GOTHIC Code in H-Shape Tube, Yu-Kai Huang (*Natl Tsing Hua Univ*)

Stability and Sensitivity Study of RELAP5 LOCA Simulation to Initial and Boundary Conditions, Jun Yang (*Univ of Wisconsin, Madison*)

Development of Uncertainty Modules for a Sub-Channel Code, Fatih Aydogan (*Univ of Idaho*)

Managing the Spectrum of Risks in the Complexities on New Build Nuclear—Call for a New Business Model to Meet the Challenges and Opportunities in the U.S. and International Nuclear Markets—Panel,

sponsored by NNTG.

Session Organizer: Jeffery J. Jay (*The Shaw Power Group*)

Room: Courtland

Today 32 nations operate 435 nuclear power reactors providing over 13% of the world's electricity. Sixty-seven new nuclear power plants (NPPs) are currently under construction in 14 countries with ~160 NPPs planned and over 320 proposed in some 42 countries. Most NPPs will be in developing nations with little or no existing infrastructure to support safe and secure operations. Markets are now expanding in the Middle East-North Africa (MENA) region with regional project investments over \$300B of new capital

into the global nuclear industry. UAE is leading the MENA region with over \$20B investment in nuclear with Korea Electric Power Company (KEPCO) spear-heading their efforts with APR 1400 technology, as well as building the necessary national regulatory and human capital infrastructure required for sustaining safe and secure operations. In addition, the U.S. expansion in first-of-a-kind nuclear technology with an investment of over \$24B is underway at Southern Nuclear's Vogtle 3&4 and SCANA's VC Summer 2&3 plants with Westinghouse AP1000 technology. Of common interests, both reactor technologies rely on critical equipment and components from South Korean suppliers as part of the worldwide network of nuclear suppliers. Thus, the economic interest in the global commercial market for nuclear energy is significant and within the next decade may be worth an estimated commercial value of as much as \$740B USD.

PANELISTS:

- Ambassador Hamad Al Kaabi (*UAE Permanent Representative to IAEA Special Representative for International Nuclear Cooperation*)
- Hee-Yong Lee (*KEPCO*)
- Gregory Smith (*URENCO*)
- Amir Shahkarami (*Exelon Nuclear Partners/Exelon Generation*)
- Joseph "Buzz" Miller (*Southern Nuclear Operating Co., Inc.*)
- Adam Stulberg (*Georgia Tech*), Panel Moderator
- Bill Linton (*Linton Consulting*)
- Representative from WANO to be determined.

Experiences of Women in Nuclear—Panel,

sponsored by ETWDD.

Session Organizer: J'Tia P. Taylor (*ANL*)

Room: Dunwoody

The Professional Women in ANS proposes a panel session for all attendees of the 2013 ANS annual conference. For this panel, women in three varying stages of their careers will be invited to share their experiences with the gathering. A mature student, a mid-career individual, and an experienced professional will speak of their career choices, challenges encountered, and their roles in the nuclear field. This panel will help bring out the subtle differences in professional experiences for men and women in nuclear and will encourage all members of ANS to learn from and relate to them.

PANELISTS:

- Mary Lou Dunzik-Gougar (*Idaho State Univ*)
- Laural Briggs (*ANL*)
- Katy Huff (*Univ of Wisconsin*)
- Linda Hansen (*ANL*)

Advanced Measurement Techniques and Surface Techniques,

sponsored by MSTD.

Session Organizer: Kenneth J. Geelhood (*PNNL*)

Room: Fairlie

In-situ Reactor Irradiation of Silica Optical Fiber Heated to 1000°C, Christian M. Petrie, David P. Hawn, Thomas E. Blue (*Ohio State*)

Photothermal Reflectance Technique to Measure Thermal Conductivity



with Micrometer Resolution, Zilong Hua, Heng Ban (*Utah State Univ*), Marat Khafizov, Robert Schley, David Hurley, Rory Kennedy (*INL*)

Elastic Property Determination from Cantilever Resonant Frequencies for Anisotropic Materials, Zilong Hua, Heng Ban (*Utah State Univ*), Robert Schley, David Hurley (*INL*)

Distributed Temperature Measurements with Single-Mode Fiber Using Rayleigh Backscatter up to 750°C, Thomas William Wood, Bryan Blake, Thomas Blue, Christopher Petrie (*Ohio State*)

Photothermal Radiometry and Scanning Thermal Microscopy for In-depth Thermal Conductivity Characterization of Proton-Irradiated ZrC, Colby B. Jensen (*Utah State University/Universite de Reims Champagne-Ardenne*), Mihai Chirtoc, Jean-Stephane Antoniow, Nicolas Horny (*Universite de Reims Champagne-Ardenne*), Heng Ban (*Utah State Univ*)

Techniques to Improve the Corrosion Resistance of Metals, James Carr, Gokul Vasudevamurthy (*Virginia Commonwealth University*)

NRC 50.54(f) Generic Letter on NTF Recommendation 2.3, Seismic Walkdowns—Panel,

sponsored by NISD.

Session Organizer: Charles R. Martin (*DNFSB*)

Room: Hanover A

Based on the recommendations of its Fukushima near-term lessons learned task force, NRC issued a generic 50.54(f) letter in March 2012 requiring each operating nuclear power plant, among other activities, to perform an “external flooding walkdown” to assure that the plant’s protection against external flood-initiated accidents is adequate vis-à-vis the plant’s regulatory design basis. This session is intended to explore the technical basis for these walkdowns and provide insights into the result of the walkdowns in terms of safety insights and also in terms of the adequacy of the flood protection of the operating plants.

PANELISTS:

- Raymond E. (Ray) Schneider (*Westinghouse*)
- David (Dave) Lochbaum (*Union of Concerned Scientists*)
- Jim Riley (*NEI*)
- Charles R. (Chip) Martin (*DNFSB*)
- Ethan W. Hauser (*DTE Energy*)

Radiation Protection and Shielding—Roundtable,

sponsored by RPSD.

Session Organizer: Peter F. Caracappa (*RPI*)

Room: Hanover B

Everyone is invited to give a short presentation on any radiation protection and shielding topic of interest. Ten-minute time slots will be allotted on first-come/first-serve basis. This session is meant to be fast, informal, and fun.

Reactor Physics Design, Validation, and Operating Experience—I,

sponsored by RPD.

Session Organizer: Alexander Stanculescu (*INL*)

Room: Hanover C

New Reactor Physics Benchmark Data in the March 2013 Edition of the IRPhEP Handbook, John Darrell Bess, J. Blair Briggs (*INL*), Nigel (Jim) T. Gulliford (*OECD/Nuclear Energy Agency*)

Benchmark Evaluation of HTR-PROTEUS Pebble Bed Experimental Program Critical Core Loadings, John Darrell Bess (*INL*)

Criticality and Dynamic Benchmarking of the DUFF Reactor Test, David I. Poston (*LANL*)

STEK Experiment - Opportunity for Validation of Fission Products Nuclear Data, Dirceu F. da Cruz (*Nuclear Research and Consultancy Group NRG*), C. M. Sciolla, D. A. Rochman (*NRG*)

Experimental Results of Joint LANL/CEA Measurements on CALIBAN, Jesson D. Hutchinson, Avneet Sood, Brian Rooney, William Myers, Mark Smith-Nelson (*LANL*), Nicolas Authier, Amaury Chapelle, Pierre Casoli, Benoit Richard (*CEA*)

Fuel Cycle Design Optimization and Analysis,

sponsored by RPD.

Session Organizer: Moussa Mahgerefteh (*Exelon*)

Room: Hanover C

Method for Addressing Hybrid-Equilibrium Loading Constraints within the COPERNICUS Multi-Cycle Nuclear Fuel Optimization Code, David Joseph Kropaczek, Mehdi Asgari (*Studsvik Scandpower*), Moussa Mahgerefteh (*Exelon Nuclear Fuels*)

Feasibility Study of a Sustainable MOX Fuel Cycle for PWRs, Alexey I. Soldatov, Michael Perlin (*Oregon State Univ*)

Current Issues in LWR Core Design and Reactor Engineering Support—Panel,

sponsored by RPD.

Session Organizer: Moussa Mahgerefteh (*Exelon*)

Room: Hanover D

The focus of this panel session will be to share current core design capabilities, developments, and methods for addressing issues impacting core designs and associated reactor engineering support activities. Particular issues may include recent operating experiences, reactivity management, poison management, power maneuver strategies and tools, fuel performance (cladding failures, crud-induced power shift, distinctive crud pattern), impact of primary chemistry, spent fuel disposal, refueling outage length, cycle length, fuel cycle cost, power uprate, and new fuel designs.

PANELISTS:

- Steve Baker (*TransWare*)
- Robb Borland (*First Energy*)
- Edward B. Gibson (*Southern Nuclear*)
- David Brown (*TVA*)
- Vick Nazareth (*SCE*)
- Bob St Clair (*Duke Energy*)
- James Tusar (*Exelon*)

Current Issues in Computational Methods—Roundtable: Managing Modeling and Simulation Research and Innovation in an Applications-Driven Environment,

sponsored by MCD.

Session Organizer: Thomas M. Evans (*ORNL*)

Room: Hanover E

Technical Sessions by Day: Monday/Tuesday

As computational power has grown, the capabilities in modeling and simulation have expanded accordingly. The maturation of modeling and simulation as a field has naturally placed applications as the driver for projects and funding. Accordingly, increasing emphasis is placed on end-user requirements such as input, output, and features leaving little time left for numerical methods development. Furthermore, high-impact research will necessarily entail investigation in multi-dimensional problems that are difficult to prototype. These conditions combine to create a set of challenges for the future evolution of technologies in modeling and simulation: (a) what is the best mechanism for prototyping innovative methods in multidimensional, multiscale, parallel computational physics application codes within a given project scope, (b) how do we convert prototyped methods into production code, and (c) what impacts does this environment pose for the teaching and mentoring of the next generation of computational scientists and engineers?

Radiation Detection for Nonproliferation Application,

sponsored by IRD.

Session Organizer: Kenan Unlu (*Penn State*)

Room: **Hanover F**

Developing a Radiation Detector on Freestanding n-GaN, Padhraic L. Mulligan, Jinghui Wang, Lei R. Cao (*Ohio State*)

Advancements in Radioxenon Production at The University of Texas at Austin, Steven Biegalski, Franziska J. Klingberg (*Univ of Texas, Austin*)

Background Radioxenon Soil Concentrations Due to Spontaneous Fission, Christine Johnson, Steven R. Biegalski (*Univ of Texas, Austin*)

Performance and Design Optimization of Graphene Field-Effect Transistors for Radiation Detection, Igor Jovanovic (*Purdue Univ*), Ozhan Koybasi (*Massachusetts General Hospital*), Edward J. Cazalas (*Penn State*), Isaac Childres, Yong Chen (*Purdue Univ*)

Simulation and Analytical Form of the Molten Salt Alpha-Particle Spectrum, Timothy R. Garcia, Benjamin Reinke, Ashutosh Kumar, Wolfgang Windl, Thomas Blue (*Ohio State*)

Advanced Fuel Cycle Cost Basis Report Update,

sponsored by FCWMD.

Session Organizer: Michael J. Lineberry (*Idaho State Univ*)

Room: **Hanover G**

Introduction to the Advanced Fuel Cycle Cost Basis for the Economic Analysis of Proposed Nuclear Fuel Cycles, Kent Alan Williams (*Engineering Consultant*), Brent W. Dixon (*INL*)

The Advanced Fuel Cycle Cost Basis for Front End Technologies, Erich Schneider (*Univ of Texas, Austin*), Kent A. Williams (*Retired*), invited

The Advanced Fuel Cycle Cost Basis for Reactor Technologies, Edward Hoffman (*ANL*), Francesco Ganda (*INL*)

Geologic Disposal Costs for Domestic SNF and HLW, Joe Carter, Steve Sheetz (*SRNL*)

Tuesday, June 18, 2013

(Asterisks indicate special sessions.)

7:30 a.m.-5:00 p.m. Meeting Registration

8:00 a.m.-10:00 a.m. Spouse/Guest Hospitality

8:30 a.m.-11:30 a.m. 2013 ANS Annual Meeting Technical Sessions

- General Two-Phase Flow
- Communicating for New Nuclear Facilities—Panel
- Communicating for Science—Paper/Panel
- Aerospace Nuclear Science and Technology: General
- Radiation Transport, Protection and Shielding at Accelerator Facilities
- The Nuclear New Build Supply Chain and Procurement Issues—Panel
- Computational Tools for Radiation Protection and Shielding
- Reactor Physics: General—I
- Advanced Modeling and Simulation in Reactor Physics—I
- Data Analysis in Nuclear Criticality Safety—I
- Reactor Instrumentation and Neutron Beam Instrumentation for Research Reactors
- Hybrid Energy: Combining Nuclear and Other Energy Sources

1:00 p.m.-4:00 p.m. 2013 ANS Annual Meeting Technical Sessions

- Thermal Hydraulics: General
- Emerging Issues in Nuclear Facility Safety
- Recent Developments with Nuclear Security and Safeguards
- K-12 Outreach—I: Success Stories—Paper/Panel
- K-12 Outreach—II: Southern Company Case Study—Panel
- New Measurement Technologies for Current and Next-Generation Reactors
- Young Blood: Integration and Retention of the Next Generation—Paper/Panel
- Nuclear Materials
- Reactor Physics Design, Validation, and Operating Experience—II
- Advanced Modeling and Simulation in Reactor Physics—II
- Transport and Computational Methods
- Nuclear Chemistry and Radiochemistry
- Fuel Cycle Simulators and Systems Analysis



Technical Sessions by Day: Tuesday

TUESDAY, JUNE 18, 2013, 8:30 A.M.

General Two-Phase Flow,

sponsored by THD.

Session Organizer: Chul-Hwa Song (*KAERI-Korea*)

Room: Baker

A Model for a Spool Piece Made Up of Venturi and Void Fraction Flow Meter in Horizontal Flow, Bruno Panella, Mario De Salve, Grazia Monni (*Politecnico di Torino-Italy*)

Contact Angle Control Algorithm Development for Level Set Interface Tracking Method, Anand V. Mishra, Igor A. Bolotnov (*NCSU*)

Two-Phase Heat Transfer Validation in Interface Tracking Code, Anton O. Pylypenko, Igor A. Bolotnov (*NCSU*)

A Two-Phase Thermosyphon Experimental Facility for Fuels and Materials Irradiation, Joel L. McDuffee (*UT-Battelle*), David Felde, Larry Ott, Kevin R. Robb (*ORNL*)

RELAP5 Model of a Two-Phase ThermoSyphon Experimental Facility for Fuels and Materials Irradiation, Juan J. Carbajo, Joel L. McDuffee (*ORNL*)

Assessment of S-RELAP5 Ability to Predict Condensation in the Cold Leg, Mireille Cortes, C. K. Nithianandan (*AREVA*)

Non-condensable Gas Effect on Steam Condensation in Single Horizontal Tube with Heat Transfer to Boiling Water, Andrei V. Morozov, O. V. Remizov, D. S. Kaliakin, A. S. Soshkina (*IPPE*)

Communicating for New Nuclear Facilities–Panel,

sponsored by ETWDD.

Session Organizer: Mimi H. Limbach (*Potomac Communications Group*)

Room: Dunwoody

Communications professionals from utilities and major suppliers involved in building new nuclear energy facilities will discuss the challenges they have faced, what they have learned about successful communications, and what they would do differently the next time. The PI Committee is inviting communications pros from Southern Nuclear, SCE&G, TVA, and Westinghouse.

PANELISTS:

- Todd Terrell (*Georgia Power*)
- Mike Bradley (*TVA*)
- Amy Lientz (*INL*)

Communicating for Science–Paper/Panel,

sponsored by ETWDD.

Session Organizer: Teri L. Ehresman (*INL*)

Room: Dunwoody

PAPER

Organizational Lessons Learned from the Space Shuttle Program, Kara Anne Schmitt (*Florida Institute of Technology*)

PANEL DISCUSSION

As government funding for science erodes, communicating about its importance and the necessity for stable funding sources is increasingly crucial. ANS members with experience in this arena along with communications professionals from national labs and independent science organizations will discuss the key issues, the approaches that have worked best and those that have not.

PANELISTS: to be determined.

Aerospace Nuclear Science and Technology: General,

sponsored by ANSTD.

Session Organizer: Martin Sattison (*INL*)

Room: Fairlie

Experimental Demonstration of a Heat Pipe/Stirling Engine Nuclear Reactor, Patrick R. McClure (*LANL*)

Nuclear Batteries at the Small and Large Scales Using Suitable Design Scheme(s), Eric V. Steinfelds (*Western Kentucky University*), Mark A. Prelas (*Univ of Missouri, Columbia*), Keith Andrew (*Western Kentucky Univ*)

New Equipment Available for Radiation Space Effects Testing, Dave Schettler, Chris Vanderpool (*Hopewell Designs Inc*), Robert O. Rushton (*Hopewell Designs, Inc.*)

Radiation Transport, Protection and Shielding at Accelerator Facilities,

sponsored by AAD; cosponsored by RPSD.

Session Organizer: Irina Popova (*ORNL*)

Room: Fairlie

Radiation Protection Study for the LINAC4 Beam Dump Shielding at CERN, Jan Blaha, Joachim Vollaie (*CERN*)

Experiments Supporting the Development of Mo-99 Production Technologies Without HEU, Charles Kelsey, Greg Dale, Keith Woloshun, Eric Olivas, Michal Mocko, Michael Holloway, Ken Hurtle, Frank Romero, Dale Dalmas, Iain May (*LANL*)



The Nuclear New Build Supply Chain and Procurement Issues—Panel,

sponsored by OPD.

Session Organizer: Myron M. Kaczmarzky (*The Shaw Group Inc., Nuclear Division*)

Room: Hanover A

This session is an update on the development of the nuclear new build supply chain in the U.S., and globally. Procurement of nuclear quality plant material and components for nuclear new build projects is a challenge the industry is facing as new plant orders are placed globally. The particular challenges of vendor qualification for safety-related and nonsafety components, commercial-grade dedication programs, as well as the certification/inspection programs to prevent fraudulent and counterfeit materials, will be addressed. This session will gather experts in the nuclear supply chain and investigate these challenges with supplier development and localization versus globalization of the supply chains for new plant builds.

PANELISTS:

- Juan Molina (*Westinghouse*)
- Jim Malone (*CB&I Power*)
- AREVA-NP representative to be determined.
- Bill Linton (*Linton Consulting*)

Computational Tools for Radiation Protection and Shielding,

sponsored by RPSD.

Session Organizer: Peter F. Caracappa (*RPI*)

Room: Hanover B

Propagation of Uncertainty from a Source Computed with Monte Carlo, Douglas E. Peplow, Ahmad M. Ibrahim, Robert E. Grove (*ORNL*)

Novel Hybrid Monte Carlo/Deterministic Technique for Shutdown Dose Rate Calculations, Ahmad M. Ibrahim, Douglas E. Peplow, Robert E. Grove (*ORNL*)

MCNP Simulations of Background Particle Fluxes from Galactic Cosmic Rays, Gregg W. McKinney (*LANL*), Javier Palomares (*Stanford Univ*)

Computational Eye Model for Interventional Radiology Dosimetry and Multi-Scale Whole-Body Phantoms, Ashley M. Rhodes, Derek A. Fiedler, Peter F. Caracappa (*RPI*)

An Improved C-12 Proton Capture Library for Emitting Correct Mono-Energetic Gamma Spectra, Michael Lorne Fensin, Gregg W. McKinney (*LANL*)

SNAP-3 Response Function and Its Application, Jun Li (*Univ of North Carolina*), John Mattingly (*NCSU*)

A Dose-Reconstruction Simulation of the 1999 Tokaimura Criticality Accident Using Motion Capture Data to Simulate Worker Posture, Justin A. Vazquez, Peter F. Caracappa, X. George Xu (*RPI*)

Reactor Physics: General—I,

sponsored by RPD.

Session Organizer: Alexander Stanculescu (*INL*)

Room: Hanover C

Pin-Level Reconstruction of Various Neutronic Quantities in Fast Reactors: Enhanced Physical Insight and Optical Titillation, Mark Reed (*MIT*), Nicholas Touran (*TerraPower*), Kord Smith, Benoit Forget (*MIT*)

The Neutronics of a Burning-Breeding Nuclear System, Stefano Buccheri, Sandra Dulla, Piero Ravetto (*Politecnico di Torino-Italy*)

Application of an Annular Metallic Fuel with Lower Gas Plenum for Sodium-Cooled Fast Reactor, Nicolas E. Stauff, T. K. Kim, D. Yun, T. A. Taiwo, H. S. Khalil (*ANL*)

Status of ASTRID Core Studies at the End of Predesign Phase 1, Marie-Sophie Chenaud (*CEA*), N. Devictor, C. Venard, G. Mignot, F. Varaine (*CEA Cadarache*), V. Garat, D. Verrier (*AREVA-NP*), D. Schmitt (*Electricité de France*)

Advanced Modeling and Simulation in Reactor Physics—I,

sponsored by RPD.

Session Organizer: Ugur Mertuyurek (*ORNL*)

Room: Hanover D

Exploratory Development of Multi-Physics Reduced Order Modeling, Bassam Abdullah Khuwaileh, Hany S. Abdel-Khalik (*NCSU*)

Advanced Neutronics Methods for Analysis of the RBWR-AC, Andrew C. Hall (*Univ of Michigan*), Yunlin Xu (*ANL*), Andrew M. Ward, Thomas J. Downar (*Univ of Michigan*), Koroush Shirvan, Mujid S. Kazimi (*MIT*)

Development and Applications of a Modern ORIGEN Code Architecture, Steve Eugene Skutnik (*Univ of Tennessee*), Frantisek Havluj (*Nuclear Research Institute, Czech Republic*), Daniel E. Lago (*Georgia Tech*), Ian C. Gauld (*ORNL*)

Low-Order Approximations to the Angular Flux Time Derivative for Transport-Based Reactor Kinetics, Adam J. Hoffman, John C. Lee (*Univ of Michigan*)

Anomaly Detection for High Fidelity Core Simulators, Ugur Mertuyurek, Neeti Pokhriyal, Jay Billings, Andrew Godfrey (*ORNL*)

AP1000 Calculation Using the Reactor Physics Codes in COSINE Project, Wang Changhui, Chen Yixue, Yu Hui, Liu Zhanquan (*State Nuclear Power Software Development Center*)

Fission Products Profiles Measurements and Calculus in Gadolinium Doped Nuclear Fuel, Dario Pieck, Remy Delorme, Julien Politello (*CEA*)



Data Analysis in Nuclear Criticality Safety—I,

sponsored by NCSD.

Session Organizer: Allison D. Miller (SNL)

Room: Hanover E

COG Preliminary Results for a SILENE Criticality Excursion Benchmark Experiment, Soon Sam Kim, David Heinrichs, Rich Buck, Ed Lent, Chuck Lee (LLNL)

K-25/K-27 Buildings Sodium Fluoride Trap Criticality Assessment, Roy W. Rathbun, Michael Crouse (URS Professional Solutions)

Comparison Between the United States and United Kingdom Criticality Safety Personnel Training Program Guidance, Andrew R. Wysong (LLNL & UC Berkeley), David P. Heinrichs (LLNL), Nigel P. Tancock (Atomic Weapons Establishment)

Use of Gadolinium as a Primary Criticality Control in Fuel Fabrication Process, Davoud Allen Eghbali (GE-Hitachi Nuclear)

Release of ENDF/B-VII.1-Based Continuous Energy Neutron Cross Section Data Tables for MCNP, Jeremy L. Conlin, Steven J. Gardiner, D. Kent Parsons, A. C. Kahler, M. Beth Lee, Morgan C. White (LANL)

Roles of Information Technology in Nuclear Criticality Safety Training, Chuck K. Lee, S. Huang (LLNL), M. Lee (DOE), J. Morman (ANL), R. Goold, C. Lee, D. Heinrichs (LLNL)

Criticality Safety and Non Destructive Assay 'A K-25 Love Story?', Roger W. Bartholomay (URS Professional Solutions), Brandon Rasmussen (Restoration Services Incorporated)

Marrying Characterization Results and Burial Model Configuration Calculations, Roger W. Bartholomay (URS Professional Solutions), Roy Rathbun (URS-Professional Solutions)

Reactor Instrumentation and Neutron Beam Instrumentation for Research Reactors,

sponsored by IRD; cosponsored by BMD.

Session Organizer: Kenan Unlu (Penn State)

Room: Hanover F

Measure Internal Conversion Electron Spectrum of Gadolinium Neutron Capture Using Neutron Beam, Lei Cao, Praneeth Kandlakunta (Ohio State)

A Preliminary Study of ^{157}Gd Thermal Neutron Capture Cross Section with Activated Prompt Gamma Rays, Danyal Jacob Turkoglu, Lei Cao (Ohio State)

Temperature Controlled Cryostat for Electrical and Optical Reactor Irradiation Experiments, Benjamin T. Reinke, Timothy R. Garcia, Tom W. Wood, Christian M. Petrie, Thomas E. Blue, Ashutosh Kumar (Ohio State)

Estimated Critical Position (ECP) Calculator for the MITR-II, Sarah Margaret Don, Lin-Wen Hu, Thomas H. Newton (MIT)

Modeling and Exposure of LiMnO_2 Batteries to Reactor Neutrons, Keith Holbert, Tyler Stannard, Anthony Christie, Taipeng Zhang (Arizona State Univ), Erik Johnson (Radiation Monitoring Devices Inc)

Hybrid Energy: Combining Nuclear and Other Energy Sources,

sponsored by FCWMD.

Session Organizer: Charles W. Forsberg (MIT)

Room: Hanover G

Coupling Hybrid Energy Systems and Salt-Cooled Reactors with Nuclear Air-Brayton Combined Cycles (NACC), Charles W. Forsberg (MIT)

Light-Water-Reactor Arrays for Production of Shale Oil and Variable Electricity, Daniel Joseph Curtis, Charles W. Forsberg (MIT)

Energy Storage: Improving Fast Reactor Economics, Cal R. Abel, Bojan Petrovic (Georgia Tech)

LWR Outlet Temperature Upgrading Using a Chemical Heat Pump, Daniel S. Wendt, Piyush Sabharwall (INL), Vivek Utgikar (Univ of Idaho)

TUESDAY, JUNE 18, 2013, 1:00 P.M.

Thermal Hydraulics: General,

sponsored by THD.

Session Organizer: Hisashi Ninokata (Politecnico di Milano)

Room: Baker

A Model to Predict Critical Flow Velocity for a Flat Laminate Plate, Philip J. Jensen, Wade R. Marcum (Oregon State Univ)

Impact of Thermal-Hydraulic Fidelity on the Prediction of Crud Deposition on PWR Fuel Rods, Annalisa Manera, Christian Bolesch, Dan Walter, Victor Petrov (Univ of Michigan), Brian Kendrick (LANL)

Pulsating Turbulent Penetration in T-Junction Mixing Experiments, John Kickhofel, Horst Michael Prasser (ETH Zürich)

Computational Fluid Dynamic Modeling via COMSOL of Isoflux Vertical Parallel Plates, Lucas L. Kyriazidis, John R. White (Univ of Massachusetts-Lowell)

Simulation of Flow-Induced Vibration on a Multi-Plate Experiment in Water, Warren F. Jones, Spencer D. Snow (INL), Wade R. Marcum, Trevor Howard (Oregon State Univ)

Simulator Platform Integrated Uncertainty Quantification and Sensitivity Analysis Software Tool, Hu Luo, Zen Y. Wang (GSE Systems Inc.), Qiao Wu (Oregon State Univ)



Design of Apparatus for Validation Experiments, Jeff R. Harris, Blake Lance, Barton L. Smith (*Utah State Univ*)

Validation Study on Transient Mixed Convection, Blake W. Lance, Jeff R. Harris, Barton L. Smith, Jared Micheal Iverson (*Utah State Univ*)

The Effect of Vertical Oscillation on Density Lock, Shengfei Wang (*North China Electric Power Univ*), Changqi Yan (*Harbin Engineering Univ*), Yu Yu, Fenglei Niu (*North China Electric Power Univ*)

Emerging Issues in Nuclear Facility Safety,

sponsored by NISD.

Session Organizer: Matthew R. Denman (*SNL*)

Room: Courtland

The Societal Risk of Severe Accidents in Nuclear Power Plants, Richard S. Denning, Sean McGhee (*Ohio State*)

A Risk Limit Curve Approach to Extending the Design Basis, Richard S. Denning, Ji Hyun Lee, David Grabaskas, Tunc Aldemir (*Ohio State*)

Safety Analysis on AP1000 Containment Cooling System Response Under LBLOCA Conditions, Zhen Yu Hung, Yuh-Ming Ferng, Bau-Shei Pei (*National Tsing Hua Univ*)

RAVEN: A GUI and an Artificial Intelligence Engine in a Dynamic PRA Framework, Cristian Rabiti, D. Mandelli, A. Alfonsi, J. Cogliati, R. Kinoshita, D. Gaston, R. Martineau, C. Smith (*INL*)

Recent Developments with Nuclear Security and Safeguards,

sponsored by NNTG; cosponsored by ETWDD.

Session Organizer: Larry R. Foulke (*Univ of Pittsburgh*)

Room: Courtland

Risk-Informed Analysis Applied to Small Modular Reactor Security, Benjamin B. Cipiti, Gregory D. Wyss, Felicia A. Duran (*SNL*)

Detection and Positioning of Radioisotopes Using a Four-Detector Response Algorithm, Michael J. Willis, Steve E. Skutnik, Howard L. Hall (*Univ of Tennessee*)

Iterative Method for Determining Isotopic Composition of Nuclear Fuel Using Irradiation at Multiple Neutron Spectra, Jason M. Lewis (*Univ of Florida*)

K-12 Outreach—I: Success Stories—Paper/Panel,

sponsored by ETWDD.

Session Organizer: Elizabeth L. McAndrew-Benavides (*NEI*)

Room: Dunwoody

PAPER

Lessons Learned from High School Outreach Efforts, Nathan L. Zohner, Mark White (*INPO NA-YGN*)

PANEL DISCUSSION

PANELISTS:

- STEMersion: Collaborative Approach to K-12 Outreach in Charlotte N.C., Debbie Hager (*Duke Energy*)
 - Pre-College Engagement at NC State University, Lisa Marshall (*NCSU*)
- Other panelists to be determined.

K-12 Outreach—II: Southern Company Case Study—Panel,

sponsored by ETWDD.

Session Organizer: Elizabeth L. McAndrew-Benavides (*NEI*)

Room: Dunwoody

The Southern Company team will discuss the following topics: developing an outreach strategy; collaborating over multiple business units for results; and executing education and industry partnerships including energy education, Nuclear and Georgia Power Energy Academy Summer Camps, Jenkins High School Engineering Academy, SkillsUSA, High School Students for Success in the Nuclear Uniform Curriculum Program with a Nuclear Boot Camp, participating in a Statewide Energy Career Cluster, and linking K-12 to college, training, and jobs.

PANELISTS:

- Andrew Bouldin (*Southern Company*)
- Debra Howell (*Georgia Power Co.*)
- Nora Swanson (*Southern Nuclear*)

New Measurement Technologies for Current and Next-Generation Reactors,

sponsored by HFICD.

Session Organizer: Hashem M. Hashemian (*Analysis & Measurement Services Corp.*)

Room: Fairlie

Modeling and Dynamic Simulation of an Integral Pressurized Water Reactor, Belle R. Upadhyaya, Price Collins, Matthew Lish, Wesley Hines (*Univ of Tennessee*), Charbak Mitra (*Analysis & Measurement Services Corporation*)

Online Monitoring in Research Reactors - Safe and Effective, Ryan O'Hagan, Matt Pruitt, Hash Hashemian (*AMS*), Myron Walz (*INL*)

Gas Impurity Monitoring in Advanced Small Modular Reactors, Norm C. Anheier, Jonathan D. Suter, H. Amy Qiao (*PNNL*)

Wide Range Counting System Digital Upgrade at the High Flux Isotope Reactor, Kevin L. Shaw (*ORNL*), invited

Monitoring Tank Levels in Nuclear Reactor Containment, Hashem M. Hashemian, Steve Johnson, Chad Kiger (*AMS*)



Young Blood: Integration and Retention of the Next Generation—Paper/Panel,

sponsored by OPD.

Session Organizer: Gale Hauck (*Westinghouse*)

Room: Hanover A

PAPER

Developing and Retaining Next Generation Leaders: Research and Field Work with First-Line Supervisors and Military Recruits, Mary Jo Rogers (*Strategic Talent Solutions*)

PANEL DISCUSSION

The nuclear power industry has changed significantly over the last decade in many ways. One of the challenges facing the industry is the fact that few new employees stay with the same job or even with the same company over their entire career. This session will discuss how different facets of the nuclear industry are focusing on recruiting and retaining employees. Of particular interest is the “next generation”—young employees and new college graduates. The changing demands of these employees have created new challenges for employers. Companies have a tremendous opportunity to make adjustments in order to leverage the enthusiasm and energy of the young generation in nuclear.

PANELISTS:

- Kati Austgen (*NEI*)
- Harsh Desai (*KAPL*)
- Joe McGuinness (*FPL*)
- Pete Shaw (*Westinghouse*)
- Rachel Slaybaugh (*Bettis*)
- Nicolas Stauff (*ANL*)
- Art Wharton (*Westinghouse*)

Nuclear Materials,

sponsored by MSTD.

Session Organizer: Kenneth J. Geelhood (*PNNL*)

Room: Hanover B

The Effect of Helium Point Defects on the Tensile Strength of Irradiated Tungsten Nanostructures, You Sung Han, Vikas Tomar (*Purdue Univ*)

Multiscale Modelling of Hydrogen Embrittlement in Zirconium Alloys, Jassel Sunil Majevadiah, Mark Wenman, Daniel Balint, Adrian Sutton (*Imperial College London*)

A Study of Initial Hydrogen Uptake in Zr-Based Cladding Alloys, Shreyas Rajasekhara, David G. Enos, Barney L. Doyle, Blythe G. Clark (*SNL*)

Graphite Compressive Creep Capsule Design for Irradiation in the HFIR, Richard Harmon Howard (*ORNL*), Joel L. McDuffee (*UT-Battelle*), Yutai Katoh (*ORNL*)

Local Amorphization and Dislocation Interactions at Low Neutron Flux

in NBG-18 Graphite, Ram Krishna, Jacob Eapen (*NCSU*), T. D. Burchell (*ORNL*), K. L. Murty (*NCSU*)

Irradiation Response of Boron Nitride Nanotubes Using Molecular Dynamics Simulations, William Christopher Lowe, Jacob Eapen (*NCSU*)

Bi-metallic Composites to Raise Peak Temperatures of the Fluoride-Salt-Cooled High-Temperature Reactor (FHR), Michael Philip Short, Ronald G. Ballinger, Charles W. Forsberg (*MIT*)

On the Relationship Between Dynamic Solubility, Multi-Atom Bubble Nucleation, Irradiation-Induced Re-Solution, and the Bubble Size Distribution in Xe Implanted Mo, Jeffrey Rest, Di Yun, Bei Ye, Zeke Insepov (*ANL*)

Forecasting and Research of Models of Constructional Materials Synthesized in Multicomponent Plasma Conditions, Alexander I. Ksenofontov, E. I. Kurbatova (*National Research Nuclear University*), J. L. Regens (*Univ of Oklahoma*)

Reactor Physics Design, Validation, and Operating Experience—II,

sponsored by RPD.

Session Organizer: Alexander Stanculescu (*INL*)

Room: Hanover C

Hot Zero and Full Power Validation of PHYSICS RELAP-5 Coupling, F. Lodi (*Univ of Bologna*), C. Rabiti, A. Alfonsi, A. Epiney (*INL*), M. Sumini (*Univ of Bologna*)

A Novel Utilization of Er Burnable Absorber for Improvement of CANDU Safety Parameters, Woosong Kim, Yonghee Kim (*KAIST*)

Optimizing PWR Low Leakage Cores with Genetic Algorithms and Other Techniques, Samuel N. Levine, Kostadin Nikolov Ivanov, Taylor Blyth (*Penn State*), invited

Feasibility Study on Korean WH type 2-loop Core AO Biasing with Axial Albedo Correction, Seung-Beom Son, Do-Ik Chang, Jung-Gyw Lee, Hae-Seuk Woo, Chang-Sok Cho (*KEPCO Nuclear Fuel. Co.*)

Pulse Superimposition Calculation Methodology for Rossi-Alpha Distribution Using MCNP6, Alberto Talamo (*ANL*)

Power Flattening Study for Ultra-Long Cycle Fast Reactor UCFR-1000, Taewoo Tak, Deokjung Lee (*UNIST*)

Advanced Modeling and Simulation in Reactor Physics—II,

sponsored by RPD.

Session Organizer: Ugur Mertuyurek (*ORNL*)

Room: Hanover D

Verification of MPACT: Michigan Parallel Characteristics Transport Code,



Benjamin S. Collins, Brendan M. Kochunas, Daniel R. Jabaay, Thomas J. Downar, William R. Martin (*Univ of Michigan*)

Simulation of High Temperature Engineering Test Reactor, HeeHo Park, Thomas Saller, Volkan Seker, Thomas J. Downar (*Univ of Michigan*)

Rapid Light Water Reactor Modeling for MCNP and Associated Boiling Water Reactor Library, Noah A. Fischer, Holly R. Trellue, Jack Galloway (*LANL*)

Full Core Burnup Calculations with MonteBurns Version 3.0, Jack Galloway, Holly Trellue (*LANL*)

Parameter and Constraint Optimization of McFLOP, Youn Duk Nam, Hae Chan Lee (*Kepeco Nuclear Fuel Co.*), Tong Kyu Park (*Seoul Natl Univ-Korea*)

Irradiation of U-Zr Samples in the High Flux Isotope Reactor: Reactor Physics and Isotopics Calculations, Ronald J. Ellis (*ORNL*)

Sensitivity of Thorium-Fueled Reduced Moderation BWR Performance to Void Fraction Correlation, Christopher Richard Varela, Jeffrey Seifried, Ehud Greenspan, Jasmina Vujic (*Univ of California, Berkeley*)

Transport and Computational Methods,

sponsored by MCD.

Session Organizer: Brian C. Franke (*SNL*)

Room: Hanover E

Implementation of the Doppler Broadening Rejection Correction in KENO, Shane W. Hart, Ivan Maldonado (*Univ of Tennessee*), Sedat Goluoglu (*Univ of Florida*), Brad Rearden (*ORNL*)

Hybrid Method of MOC and MC for Efficient Continuous Energy Neutron Transport Analysis, Hyunsuk Lee, Chidong Kong, Sooyoung Choi, Deokjung Lee (*Ulsan Natl Inst Sci Tech*)

Reduction of Azimuthal Angle Discretization Error in Method of Characteristics by Using Gaussian Quadrature Set, Hyun Chul Lee, Jin Young Cho, Jae Man Noh (*KAERI-Korea*)

Application of Inverse Gamma Transport to Material Thicknesses Identification with SGRD Code, Philippe Humbert (*CEA*)

An Update of ARCHER, a Monte Carlo Radiation Transport Software Tested for Emerging Hardware Such as GPUs, George Xu (*RPI*)

Multi-Level Iteration Optimization for the Variational Nodal Method with Multi-Group GMRES Algorithm, Yunzhao Li (*Xi'an Jiaotong Univ*), Elmer E. Lewis (*Northwestern Univ*), Micheal A. Smith (*ANL*)

Nuclear Chemistry and Radiochemistry,

sponsored by IRD; cosponsored by BMD.

Session Organizer: Kenan Unlu (*Penn State*)

Room: Hanover F

Nuclear and Radiochemistry Education at Texas A&M University, Charles Marvin Folden (*Texas A&M*)

Analysis and Characterization of a Californium 252 Sample, Derek Stephen Schanze (*Univ of Florida*), Donna Beals, Mike Bronikowski (*SRNL*), Kelly Jordan (*Univ of Florida*)

Curriculum Development for the Chemistry of the Nuclear Fuel Cycle at the Pennsylvania State University, Amanda M. Johnsen, Kenan Unlu (*Penn State*)

Radiochemistry Education and Research Programs at the Pennsylvania State University, Amanda M. Johnsen, Kenan Unlu (*Penn State*)

Spent Fuel Characterization with the Multi-Isotope Process Monitor, Jamie B. Coble, Christopher R. Orton, Jon Schwantes (*PNNL*)

Fuel Cycle Simulators and Systems Analysis,

sponsored by FCWMD.

Session Organizer: Paul P. Wilson (*Univ of Wisconsin, Madison*)

Room: Hanover G

Dynamic Determination of Thermal Repository Capacity for Fuel Cycle Analysis, Kathryn D. Huff (*Univ of Wisconsin, Madison*), Alexander T. Bara (*Univ of Illinois*)

Developing Standardized, Open Benchmarks and Scenario Definitions for Simulation of the Once-Through Fuel Cycle, Matthew Gidden (*Univ of Wisconsin, Madison*), Anthony M. Scopatz (*Enthought, Inc.*), Paul P. Wilson (*Univ of Wisconsin, Madison*)

Nuclear Fuel Cycle Analysis and Optimization with the Code for Advanced Fuel Cycles Assessment (CAFCA), Samuel O. Brinton (*MIT*), Stefano Passerini (*ANL*), Mujid Kazimi (*MIT*)

Nuclear Resources Utilization in Full Recycling Nuclear Fuel Cycle with Limited Separation Capacity, Bojan Petrovic, Abiodun Idowu Adeniyi (*Georgia Tech*)



Technical Sessions by Day: Wednesday

Wednesday, June 19, 2013

7:30 a.m.-5:00 p.m. Meeting Registration

8:00 a.m.-10:00 a.m. Spouse/Guest Hospitality

8:30 a.m.-11:30 a.m. 2013 ANS Annual Meeting
Technical Sessions

- Thermal Hydraulics in Severe Accidents
- Commercial-Grade Dedication of Real-Time Software—Panel
- Training, Human Performance, and Workforce Development
- Human Factors: General
- New Nuclear Construction Around the World—Status Report—Panel
- Space Radiation Shielding Methods and Applications
- Radiation Protection and Shielding: General
- Student Research in Reactor Physics—I
- Reactor Analysis Methods—I
- Data Analysis in Nuclear Criticality Safety—II
- Isotopes and Radiation: General
- Biology and Medicine: General
- Fuel Cycle and Waste Management: General—I

1:00 p.m.-4:00 p.m. 2013 ANS Annual Meeting
Technical Sessions

- Computational Thermal Hydraulics—II
- Commercial-Grade Dedication of Non-Real-Time Software—Panel
- Education, Training, and Workforce Development: General
- Advances in Diagnostic and Prognostic Technologies
- Advanced/Gen-IV Reactors
- Nuclear Fuels
- Student Research in Reactor Physics—II
- Reactor Physics: General—II
- Mathematical Modeling, Uncertainty Quantification, and Sensitivity Analysis Methods
- New Horizons in Medical Health Physics
- Fuel Cycle and Waste Management: General—II

7:00 p.m. Dinner at Agatha's
A Taste of Mystery

WEDNESDAY, JUNE 19, 2013, 8:30 A.M.

Thermal Hydraulics in Severe Accidents,

sponsored by THD.

Session Organizer: John C. Luxat (*McMaster Univ*)

Room: Baker

PWR Ex-Vessel Steam Explosion Analysis in 3-D, Matjaz Leskovicar (*Jozef Stefan Inst*)

Study of Degas Influence for CHF Extended with Downward-Facing Boiling, Huai En Hsieh, Yuh-Ming Ferng, Mei-Shiue Chen, Bau-Shi Pei (*Natl Tsing Hua Univ*)

Analysis of Waterhammer in RVHVS for Chinese Improved PWR, Ge Shao, Lili Tong, Xuewu Cao (*Shanghai Jiaotong Univ*)

Analysis on Containment Venting under Severe Accident for AP1000, Kai Yuan (*Shanghai Jiao Tong Univ-China*), Lili Tong, Xuewu Cao (*Shanghai Jiao Tong Univ*)

Numerical Simulation on Hydrogen Behavior in a Large Dry Containment, Lili Tong, Xuewu Cao (*Shanghai Jiaotong Univ*)

Revision of the IAEA Safety Guide on Severe Accident Management, NS-G-2.15 and the IAEA Review of Accident Management Program (*RAMP*) after the Fukushima-Daiichi Accident, SVS-9, George L. Vayssier (*NSC Netherlands*), M. Kim (*IAEA-Austria*), R. J. Lutz, R. Prior (*Westinghouse*), M. Vidard (*Consultant*), L. Gilbert (*Bruce Power NPP*)

The Design and CFD Simulation of a New Spent Fuel Pool Passive Cooling System, Cheng Ye, Minglu Wang (*Shanghai Jiao Tong Univ-China*)

Commercial-Grade Dedication of Real-Time Software—Panel,

sponsored by NISD.

Session Organizer: Charles R. (Chip) Martin (*DNFSB*)

Room: Courtland

Commercial-grade dedication (CGD) process for software not developed under an acceptable SQA development program. Generally this requires preparation of a CGD review plan; determination of program requirements; review of program design, review of source code, program integration, and documentation; review of program testing; review of test results-validation; and preparation of the CGD review report. This session will explore experiences with such a process for digital safety-related instrumentation and control systems.

PANELISTS:

- Rossnyev Alvarado (*NRC*)
- Keith Morrell (*SRS*)
- Warren R. Odess-Gillett (*Westinghouse*)
- Eva Freund (*The IV&V Group, Inc.*)
- David Herrell (*MPR Assoc*)
- Charles R. (Chip) Martin (*DNFSB*)



Training, Human Performance, and Workforce Development,
sponsored by ETWDD.

Session Organizer: John S. Bennion (*GE-Hitachi Nuclear*)

Room: Dunwoody

Recruiting Women Today and Tomorrow Through Education, Adrian M. Skinner (*Excelsior Coll*)

Designing, Developing and Implementing High Quality Nuclear Workforce Educational Programs, Gemma K. Frock, J. David Deal (*Aiken Technical College*)

Exelon's Approach to Improving Operator Fundamental Performance, Gregg W. Ludlam (*Exelon*)

Design Basis Retrievability, Charles Edward DeDeaux (*EXCEL Services Corporation*), Erica Love-White (*Southern Nuclear Corporation*), Jerry Voss (*EXCEL Services Corporation*)

Maturity of a Nuclear-Related Knowledge Management Solution, Matt Kelley, Millie Sass (*Westinghouse*), Brian Moon (*Perigean Technologies*)

Human Factors: General,

sponsored by HFICD.

Session Organizer: Hashem M. Hashemian (*Analysis & Measurement Services Corp.*)

Room: Fairlie

Decommissioning Engineering Using Mixed Reality: Lessons Learned and Future Plans, Chih-Wei Yang, Li-Chen Yang, I-Hsin Chou, Tsung-Chieh Cheng, Chien-Liang Shih (*INER*)

Human Error Probabilities According to Human Error Modes in Advanced MCRs when Using Soft Control, Inseok Jang, Poong Hyun Seong (*KAIST*)

Application of the AUTOS Model in NPP Control Rooms, Kara Anne Schmitt (*Florida Inst of Technol*)

The Effect of Automation Features on Operating Performance, Tsung-Ling Hsieh, Chih-Wei Yang (*Institute of Nuclear Energy Research, R.O.C.*), Tsung-Chieh Cheng (*INER*), Hui-Wen Huang (*Institute of Nuclear Energy Research, R.O.C.*)

New Nuclear Construction Around the World—Status Report—Panel,
sponsored by OPD.

Session Organizer: Edward L. Quinn (*Technology Resources*)

Room: Hanover A

This session will focus on the latest status and developments in new reactor construction in the U.S. and around the world. Speakers from government, regulator, and industry backgrounds will address the growth and challeng-

es from their perspectives and what to expect in new developments in the coming years.

PANELISTS:

- David Matthews (*NRC*)
- Doug Walters (*NEI*)
- Zheng Mingguang (*SNERDI*)

Space Radiation Shielding Methods and Applications,

sponsored by RPSD.

Session Organizer: Lawrence W. Townsend (*Univ of Tennessee*)

Room: Hanover B

Comparison of FLUKA Lookup Tables to Existing CRAaTER Instrument Models, John M. Brittingham, Jamie Porter, Lawrence Townsend (*Univ of Tennessee*)

Neutron Interaction Cross Section Processing for Space Radiation Transport, Thomas J. Harrison, Lawrence W. Townsend (*Univ of Tennessee*)

Dose Estimates for Polar Flight Crews due to Carrington Events, Wouter C. de Wet, Lawrence W. Townsend, Claire Fage (*Univ of Tennessee*)

Comparisons of Worst Case Solar Particle Event Dose Estimates on Mars to New NASA Career Limits, Lawrence W. Townsend, Jamie Porter, Jeremy Townsend (*Univ of Tennessee*)

Radiation Protection and Shielding: General,

sponsored by RPSD.

Session Organizer: Peter F. Caracappa (*RPI*)

Room: Hanover B

Efficient Passive Gamma Detector Modeling of Spent Fuel with MCNP, Noah A. Fischer, John S. Hendricks, Jack D. Galloway, Holly Renee Trellue, Michael Lorne Fensin (*LANL*)

Simulated Energy Deposition in Thin Polymeric Films, Matthew Urffer, Laurence F. Miller, Andrew Mabe (*Univ of Tennessee*)

Impacts of the Adoption of ICRP 103: A Reactor Study, Ashley Rhodes, Justin A. Vazquez, Yiming Gao, Peter F. Caracappa, X. George Xu (*RPI*)

Student Research in Reactor Physics—I

sponsored by RPD.

Session Organizer: Mark D. DeHart (*INL*)

Room: Hanover C

The Calculation of Fuel Bowing Reactivity Coefficients in a Subcritical Fast Burner Reactor, Andrew Tyler Bopp (*Georgia Institute of Technology*), Weston M. Stacey (*Georgia Tech*)



Computational Criticality and Depletion Comparison Study on the Hybrid Subcritical Advanced Burner Reactor (SABR) Using MCNPX and ERANOS, Alex Patrick Moore, Weston M. Stacey, C. L. Stewart (*Georgia Tech*)

A Subcritical Advanced Breeder Reactor with a Tokamak Fusion Neutron Source, Christopher L. Stewart, Weston M. Stacey (*Georgia Tech*)

Core Physics Parametric Studies for Liquid Salt Cooled Reactors, Cole Gentry, Nathan George, Ondrej Chvala, Ivan Maldonado (*Univ of Tennessee*), Spenser Lewis, Pietro Avigni, Bojan Petrovic (*Georgia Tech*)

Burnup Code Development and Core Design of TWR, Wei Sun, Kan Wang (*Tsinghua Univ*)

Reactor Analysis Methods—I,

sponsored by RPD.

Session Organizer: Alexander Stanculescu (*INL*)

Room: Hanover D

Exact-to-Precision Generalized Perturbation Theory: Analytical Analysis, Congjian Wang, Hany S. Abdel-Khalik (*NCSU*)

Coupling of RELAP-7 with the Three-Dimensional Kinetics Code Rattle-Snake, Hongbin Zhang (*INL*)

Development of Active Interrogation for Monitoring Special-Nuclear-Materials (AIMS) Hybrid Tool, Katherine K. Royston, William J. Walters, Alireza Haghighat (*Virginia Tech*), Ce Yi, Glenn E. Sjoden (*Georgia Tech*)

Improvement and Validation of a Nodal-SP3 Code for Whole Core Pin-by-Pin Calculation, Liangzhi Cao, Wen Yang, Yunzhao Li, Hongchun Wu, Youqi Zheng (*Xi'an Jiaotong Univ*)

Three Dimensional Nuclear Analysis System DeCART/CHORUS/MASTER, Jin Young Cho, Jae Seung Song, Kyung Hoon Lee (*KAERI-Korea*)

Data Analysis in Nuclear Criticality Safety—II,

sponsored by NCSU.

Session Organizer: Allison D. Miller (*SNL*)

Room: Hanover E

Adjoint Sensitivity Analysis in a Large-Scale Subcritical Plutonium Benchmark, Richard T. Evans, John Mattingly (*NCSU*), Jun Li (*Univ of North Carolina*)

²³⁵U Resolved Resonance Evaluation for Benchmark Calculations in the Intermediate Energy Region, Luiz C. Leal (*ORNL*)

Corrected User Guidance to Perform Three-Dimensional Criticality Accident Alarm System Modeling with SCALE, Thomas M. Miller, Douglas E. Peplow (*ORNL*)

Preliminary Covariance Data Representation for the “A Compact ENDF” File, Brian C. Kiedrowski, Albert C. Kahler, D. Kent Parsons (*LANL*)

MCNP Simulations in Support of the Heat Pipe in Flat-Top Experiment, Rene G. Sanchez, David K. Hayes, John A. Bounds, Joetta Goda, Travis J. Grove, William L. Myers (*LANL*)

Uncertainty Evaluation of Reactivity for Long-Term Dry Cask Storage, Jeremiah Boles, Aaron McGee, Charlotta E. Sanders, Denis Beller (*UNLV*)

Variations in Computed Neutron Multiplication of Deuterium Moderated Highly Enriched Uranium Systems, Richard G. Taylor, Daniel F. Hollenbach (*Spectra Tech Inc.*)

Isotopes and Radiation: General,

sponsored by IRD.

Session Organizer: Kenan Unlu (*Penn State*)

Room: Hanover F

Safety Analysis of Accurate Therapy System Based on PSA Method, Wenyi Li, Ruifen Cao, Liqin Hu (*Chinese Academy of Science*)

Closeout of the Cf-252 Loan/Lease Program, Steven Randall Sherman, Bradley D. Patton (*ORNL*)

Study on Pulse-Power Charged All-Solid-State Battery for Radioisotope Battery, Seok Hee Lee (*Yonsei Univ*), Young Soo Yoon (*Gachon Univ*)

Calibration of Photon Detectors for 14-MeV Neutron Analysis, Alexander Barzilov (*UNLV*), Phillip Womble (*WKU*)

Biology and Medicine: General,

sponsored by BMD.

Session Organizer: Rolf L. Zeisler (*NIST*)

Room: Hanover F

An Update of the Development and Clinical Testing of Virtual Dose Software Used for Reporting CT Doses, Aiping Ding, Yiming Gao, Peter F. Caracappa, X. George Xu (*RPI*)

Radiation Therapy Method Using a Short Lived Beta-Decay Source, Robert O'Brien (*UNLV*), William G. Culbreth (*Univ of Nevada*)



Fuel Cycle and Waste Management: General—I,

sponsored by FCWMD.

Session Organizer: Jack D. Law (INL)

Room: Hanover G

Three-Way Catalysts for Managing Off-Gas from Thermal Treatment of High-Nitrate Wastes, Ki Song, Adam Foster (Studsvik, Inc)

Non-Destructive Assay of Plutonium and Uranium with the RPI LSDS, Adam Weltz (RPI), Bjorn Becker (Gael), Jon Kulisek (PNNL), Nick Thompson, Yaron Danon (RPI)

Preliminary CFD Analysis of High-Thermal Capacity Dry Storage Systems, Corey E. Clifford, Mark L. Kimber, John D. Metzger (Univ of Pittsburgh)

Salt Formations, a Safe Place for Transuranic Waste Disposal, Jean-Francois Lucchini, Marian Borkowski, Juliet Swanson, Danielle Cleveland, Michael K. Richmann, Donald T. Reed (LANL)

Sodium Borosilicate Glass: Alteration Study Under Hydrothermal-Like Conditions for its Long-Term Assessment in Geological Repository, Nishi Rani, Jaya Prakash Shrivastava (Univ of Delhi Delhi), Rakesh Bajpai (BARC, Mumbai)

WEDNESDAY, JUNE 19, 2013, 1:00 P.M.

Computational Thermal Hydraulics—II,

sponsored by THD.

Session Organizer: Igor A. Bolotnov (NCSU)

Room: Baker

The Effects of Pin Conduction in CFD Simulations of SFR Pin-Bundles, Rui Hu (ANL)

A Study of Grout Flow Pattern Analysis, Si Y. Lee (SRNL), S. Hyun (Mercer Univ)

Computational Fluid Dynamics Simulation of Vortex Shedding Between Inline Plates, Trevor Kent Howard, Wade R. Marcum (Oregon State Univ), Warren F. Jones (INL)

Single-Channel Thermal Analysis of Prismatic Block Type of VHTR Compact Fuel via Two-Temperature Homogenized Model, Yoonhee Lee, Woosong Kim, Bumhee Cho, Nam Zin Cho (KAIST)

CFD Modeling of a Coolant Channel for Missouri S&T Reactor, Susan Sipaun (Missouri Univ Sci Tech), Kelly C. O'Bryant, Muhammad Yousaf (Univ of Missouri/Rolla), Cemil Yigit (Univ of Sakarya), Carlos H. Castano, Ayodeji B. Alajo, Shoaib Usman (Missouri Univ Sci Tech)

Velocity Profile Under Natural Convection Between Two Parallel Plates, Muhammad Yousaf (Univ of Missouri/Rolla), Susan Sipaun (Missouri Univ Sci

Tech), Cemil Yigit (Univ of Sakarya), Shoaib Usman (Missouri Univ Sci Tech)

Validation of Forced and Mixed Convection Heat Transfer, Jared Micheal Iverson, Robert Spall, Barton L. Smith (Utah State Univ)

The Research of AP1000 Reactor Completely Passive Cooling, Cheng Ye (Shanghai Jiao Tong Univ-China)

Commercial-Grade Dedication of Non-Real-Time Software—Panel,

sponsored by NISD.

Session Organizer: Charles R. Martin (DNFSB)

Room: Courtland

Commercial-grade dedication (CGD) process for software not developed under an acceptable SQA development program. Generally this requires preparation of a CGD review plan; determination of program requirements; review of program design, review of source code, program integration, and documentation; review of program testing; review of test results-validation; and preparation of the CGD review report. This session will explore experiences with such a process for safety-related design and analysis software.

PANELISTS:

- Norman P. Moreau (Theseus Professional Services, LLC)
- Kevin Ake (The Shelby Group)
- William J. Bryan (ANSYS, Inc.)
- Emilio Baglietto (MIT)
- Kathleen A. Byle (Intergraph)
- Byron R. Frank (Westinghouse)

Education, Training, and Workforce Development: General,

sponsored by ETWDD.

Session Organizer: John S. Bennion (GE-Hitachi Nuclear)

Room: Dunwoody

Educating for Nuclear's Future - A Successful Regional Partnership, William Wabbersen (Savannah River Nuclear Solutions), M. (Mel) R. Buckner (Self-Employed), Mindy Mets (SRSCRO), C. L. Munns (Retired), Susan Wood (CNTA)

Collaborative Mindmapping for Nuclear Education, Jay Z. James (KEPCO Int'l Nuclear Graduate School)

Electricity Production Choices and Consequences—Overview of a New Short Course, Harold L. Dodds (Univ of Tennessee)

Development of an On-Line Radiation Detection Laboratory Using LabVIEW, Timothy DeVol, Ryan Trostad (Clemson Univ)

Fukushima Impacts on NPP Acceptance of High School Students in Thailand, Duchduen Bhanthumnavin (National Institute of Development Administration), Vutthi Bhanthumnavin (Shinawatra Univ)



Technical Sessions by Day: Wednesday

Advances in Diagnostic and Prognostic Technologies,

sponsored by HFICD.

Session Organizer: Sacit M. Cetiner (ORNL)

Room: Fairlie

Health Monitoring to Support Advanced Small Modular Reactors, Jamie B. Coble, Ryan M. Meyer, Pradeep Ramuhalli (PNNL)

Advanced Fault Monitoring and Diagnostics for Rod Control and Position Systems in Nuclear Reactors, Gregory Wayne Morton, Jacob McCulley, Sam Caylor, Hash Hashemian (AMS)

Equipment Health Monitoring in Research Reactors—Reliability Improvement, Hashem M. Hashemian, Edwin Riggsbee, Steve Johnson (AMS), Mark Linn (ORNL)

Remaining Useful Life Estimation of Electric Cables in Nuclear Power Plants, Brent Shumaker (AMS)

On-Line Monitoring with Auto-Regressive Modeling in Boiling Water Reactors, Gregory Wayne Morton, Brent Shumaker, Sam Caylor, Hash Hashemian (AMS)

Proof of Principal for the Run-Ahead Predictive Simulation Software (RAPSS), Kevin A. Makinson, Tom Riley, Andrew C. Klein (Oregon State Univ)

Advanced /Gen-IV Reactors,

sponsored by OPD.

Session Organizer: Belle R. Upadhyaya (Univ of Tennessee)

Room: Hanover A

Fluoride-Salt-Cooled High-Temperature Reactor (FHR) with Natural Gas Assist for Peak and Intermediate Electricity Loads, Charles W. Forsberg (MIT), Per F. Peterson, Harry Andreades (Univ of California, Berkeley), Lindsay Dempsay (Generation Solutions Limited, New Zealand)

Design Goals for a Fluoride-Salt-Cooled High-Temperature Test Reactor (FHTR), Charles W. Forsberg, Lin-Wen Hu (MIT)

Fluoride Salt-Cooled High Temperature Test Reactor Core Design, Rebecca Romatoski, Sarah Don, Joshua Richard, Michael Short, Lin-Wen Hu, Charles Forsberg (MIT)

High-Temperature Fluoride-Salt-Cooled Test Reactor (FHTR) Tritium and Impurity Removal System Analysis, Ethan E. Peterson, Curran Oi, Ciara Sivals, Michael Short (MIT)

Plant Design Lessons Learned from Sodium and Molten-Salt Reactors Applicable to Fluoride-Salt-Cooled High-Temperature Test Reactor (FHTR), Mark Edward Massie, Charles W. Forsberg (MIT)

A Fluoride-Salt-Cooled High-Temperature Reactor (FHR) for Isolated Locations, Ruaridh R. Macdonald, Charles W. Forsberg (MIT)

High Temperature Gas Reactor Steam Reheat, Paul John Marotta (nuExergy, LLC)

Nuclear Fuels,

sponsored by MSTD.

Session Organizer: Kenneth J. Geelhood (PNNL)

Room: Hanover B

Radial Burnup Profile Fitting of a High Burnup Pellet, Lijun Gao (Tsinghua University/Science and Technology on Reactor System Design Technology Laboratory), Shengyao Jiang (Tsinghua Univ), Bingde Chen (Nuclear Power Institute of China)

Advanced Characterization of MIMAS MOX Fuel Microstructure to Quantify the HBS Formation, Antoine Bouloure (CEA), Laurence Aufore (CEA/DEN/DEC), Eric Federici (CEA/DEC/DEC)

Simulation of Thermochemistry and Isotopic Evolution of Irradiated Nuclear Fuel, Markus H. A. Piro (ORNL), James Banfield (Univ of Tennessee), Kevin Clarno, Srdjan Simunovic, Theodore Besmann (ORNL)

Thermal Degradation of U-Mo Fuel Dispersion in Al Matrix During Irradiation, Yeon Soo Kim (ANL)

Microstructural Evolution of U-10Mo Thin Specimen Annealed at Typical Fast Reactor Temperature Regime, Di Yun, Walid Mohamed, Bei Ye, Marquis A. Kirk, Peter Baldo, Abdellatif M. Yacout (ANL)

Irradiation Behavior Analysis for U-Mo/Al Dispersion Fuels, Bei Ye, Jeffrey Rest, Yeon Soo Kim, Gerard Hofman (ANL)

Numerical Modeling of TRISO Fuel Effective Thermal Conductivity, Charlie Folsom, Changhu Xing, Colby Jensen, Heng Ban (Utah State Univ)

Comparative Study of Two γ -U(Mo) Innovative Powders: (Micro/Macro) Structural Characteristics, Guillaume Champion (CEA, DEN, DEC), Xavier Ilits (CEA, DEN, DEC), Olivier Tougait (Sciences Chimiques de Rennes)

Recovery of Uranium from Hydrophilic Phosphoric Acid Residue Using Trioctylamine, Laila Artia Guirguis, Randa M. Elrakaiby, Nagwa I. Filaila (Nuclear Materials Authority)

Student Research in Reactor Physics—II,

sponsored by RPD.

Session Organizer: Mark D. DeHart (INL)

Room: Hanover C

Development of Fuel Shuffling Module for PHYSICS, Allan Mabe (Idaho)



State Univ), Andrea Alfonsi, Cristian Rabiti, Aaron Epiney (*INL*), Michael Lineberry (*Idaho State Univ*)

Genetic Algorithm Approaches for Optimal Incore Neutron Detectors Location, Xingjie Peng, Kang Wang (*Tsinghua Univ*), Qing Li (*Nuclear Power Institute of China*)

Neutronics Performance Analysis of a Small Modular Integral Pressurized Water Reactor, Evans Damenortey Kitcher, Sunil Chirayath (*Texas A&M Univ*)

Variable Enrichment Thorium-Fueled Boiling Water Breeder Reactor, Guanheng Zhang, Jeffrey Seifried, Jasmina Vujic, Ehud Greenspan (*Univ of California, Berkeley*)

Analysis of Local Void Reactivity Coefficients for the RBWR-Th, Guanheng Zhang, Jeffrey Seifried, Jasmina Vujic, Ehud Greenspan (*Univ of California, Berkeley*)

Preliminary Study of SFR with Depleted Uranium Breed & Burn Blanket, Guanheng Zhang (*Univ of California, Berkeley*), Anselmo Cisneros (*Univ of California, Davis*), Ehud Greenspan (*Univ of California, Berkeley*)

Reactor Physics: General—II,

sponsored by RPD.

Session Organizer: Alexander Stanculescu (*INL*)

Room: Hanover D

Neutronics Analyses of NpO₂ Single Pellet Irradiations at HFIR to Support the Pu-238 Production Project, David Chandler, Randy W. Hobbs (*ORNL*)

Definition of a Spatial Correction Factor for the Experimental Prompt Neutron Decay Constant, Alberto Talamo (*ANL*)

A New Coated UO₂ Particle Fuel for Ultra-High Performance Research Reactor, Rully Hidayatullah, Yonghee Kim (*KAIST*)

Thermal Neutron Scattering Cross Sections for Silicon Carbide, Yuwei Zhu, Jonathan Wormald, Ayman I. Hawari (*NCSU*)

Development of Neutronic Models for the Pulsar Reactor in Support of Power Upgrade, Victor Gillette, Jesse Holmes, Jonathan Wormald, Ayman I. Hawari (*NCSU*)

Mathematical Modeling, Uncertainty Quantification, and Sensitivity Analysis Methods,

sponsored by MCD.

Session Organizer: Brian C. Franke (*SNL*)

Room: Hanover E

Deterministic Parameter Study for Fixed-Source Calculations Using FW-CADIS, R. N. Slaybaugh, S. C. Wilson (*Bechtel Marine Propulsion Corporation*)

Application of Generalized Linear Least-Squares for Uncertainty Quantifi-

cation in Inverse Transport Problems, Keith C. Bledsoe, Matthew A. Jessee (*ORNL*), Jeffrey A. Favorite (*LANL*)

Use of Multi-fidelity Training Data in Uncertainty Analysis of Nuclear Engineering Applications, Oleg E. Roderick, Mihai Anitescu (*ANL*)

Free Energy of Molten Salt (KCl) for Reprocessing Applications, Jin Wang, Jacob Eapen (*NCSU*)

Propagation of Uncertainty in the Inverse-Kinetics Equation, Benjamin Baker, Geroge Imel (*Idaho State Univ*)

New Approach to Creation of Geometrical Module for Nuclear Reactor Simulation Analysis, Tamara Semeonovna Poveschenko (*NRC Kurchatov Institute*), Poveschenko Oxana (*Keldysh KIAM RAS*)

New Horizons in Medical Health Physics,

sponsored by BMD.

Session Organizer: Bryan P. Bednarz (*Univ of Wisconsin, Madison*)

Room: Hanover F

Medical/Health Physics Research at RPI: A Review, X. George Xu (*RPI*), invited

Large-Scale Radiation Emergencies: What Can Medical Health Physicists Do?, Armin Ansari (*Centers for Disease Control and Prevention*), invited

New Laboratory Capabilities in Medical Physics and Nuclear Engineering Research at Georgia Tech, Glenn Eric Sjoden, Anna S. Erickson, Farzad Rahnema, Nolan Hertel (*Georgia Tech*), invited

The UF/NCI Library of Hybrid Computational Phantoms - Applications to Patient Dose Tracking in Diagnostic Imaging, Wesley Bolch, A. Geyer, D. Long, D. Borrego (*Univ of Florida*), invited

Monte Carlo-Based Radiation Dosimetry for Preclinical Trials of Radio-halogenated Pharmaceuticals, Bryan P. Bednarz (*Univ of Wisconsin, Madison*), Benjamin Titz, Joseph Grudzinski (*Novelos Therapeutics*), Abigail Besemer (*Univ of Wisconsin*), invited

In-Clinic Assessment of Skin Doses for Interventional Fluoroscopic Procedures, Wesley E. Bolch, Daniel Siragusa, David Borrego (*Univ of Florida*), invited

Fuel Cycle and Waste Management: General—II,

sponsored by FCWMD.

Session Organizer: Jack D. Law (*INL*)

Room: Hanover G

Application of NF3 to Fluoride Volatility Processing of Used Nuclear Fuel, Andrew M. Casella, Randall D. Scheele, Bruce K. McNamara (*PNNL*)

Thorium as a By-Product: A Near-Term Alternative for the Thorium Fuel



Technical Sessions by Day: Thursday

Cycle, Timothy Mason Ault, Raymond Wymer, Steven L. Krahn (*Vanderbilt Univ*)

Helical Contactor for Recovery of Uranium and Associated Metals from Uranium Ores and Radioactive Wastes, Agnieszka Miskiewicz, Grazyna Zakrzewska-Trznadel (*Inst of Nuclear Chemistry and Technology*)

Effect of Oxidation Process on the Reaction Kinetics of Zirlo Chlorination Reaction, Min Ku Jeon, Yong Taek Choi, Chang Hwa Lee, You Lee Lee, Kweon Ho Kang, Geun Il Park (*KAERI-Korea*)

Decomissioning of Production Uranium-Graphite Reactors (PUGR), Sergey Skorodumov (*JSC "Afrikantov OKBM"*), Vladimir Ezhov, Vladimir Plekhanov (*JSC "OKB Mechanical Engineering"*)

Thursday, June 19, 2013

7:30 a.m.-2:00 p.m. Meeting Registration

8:30 a.m.-11:30 a.m. 2013 ANS Annual Meeting Technical Sessions

- Thermal Hydraulics in Advanced High-Temperature Reactors
- Nuclear Installations Safety: General—I
- Legacy of John D. Metzger: Nuclear Engineering Program at the University of Pittsburgh—Panel
- Updates on Research Reactor Regulation for Instrumentation and Control Systems—Panel
- Small Modular Reactors: Progression and Status
- ADVANTG Tutorial: Automated Variance Reduction for MCNP
- Reactor Analysis Methods—II
- Physics of Fluid-Fuel Systems—I
- Nuclear Criticality Safety Standards—Forum
- Robotics and Remote Systems: General

1:00 p.m.-4:00 p.m. 2013 ANS Annual Meeting Technical Sessions

- State of the Art in Modeling Fuel Rod Ballooning, Fuel Relocation and High Burnup Issues in LOCA Evaluation Models
- Nuclear Installations Safety: General—II
- Instrumentation and Controls: General
- Accident Tolerant Fuels and Advanced Fuels
- Physics of Fluid-Fuel Systems—II

THURSDAY, JUNE 20, 2013, 8:30 A.M.

Thermal Hydraulics in Advanced High-Temperature Reactors, sponsored by THD.

Session Organizer: Piyush Sabharwall (*INL*)

Room: Baker

Effect of Salt Coolant Selection on FHTR Thermal Hydraulic Performance, Yao Xiao (*MIT, Xi'an Jiaotong Univ*), Lin-Wen Hu, Charles W. Forsberg (*MIT*), Suizheng Qiu, Guanghui Su (*Xi'an Jiaotong Univ*)

Modeling and Parametric Studies of the AHTR Fuel Element, Bojan Petrovic, Pietro Avigni (*Georgia Tech*)

CFD Study of Thermal-Hydraulic Performance of a PCHE Under FLiNaK-Helium Condition, In Hun Kim, Xiaodong Sun (*Ohio State*), Hee C. No (*KAIST*)

Design and Evaluation of Passive Decay-Heat Removal System Using Mercury Thermosyphon, Byung-Hyun You, Yong Hoon Jeong (*KAIST*)

Experimental Study on Heat Transfer to Supercritical Fluid in a Vertical Tube, Siyu Zhang, Hanyang Gu, Xu Cheng (*Shanghai Jiao Tong Univ-China*)

Thermal-Hydraulic Design of Wavy-Channel Printed Circuit Heat Exchanger for Advanced Reactors, Nathan Bartel, Vivek Utgikar (*Univ of Idaho*), Piyush Sabharwall (*INL*), Minghui Chen, In Hun Kim, Xiaodong Sun, R. N. Christensen (*Ohio State*)

Design of Printed Circuit Heat Exchangers for Very High Temperature Reactors, Minghui Chen, In Hun Kim, Xiaodong Sun, Richard Christensen (*Ohio State*), Nathan R. Bartel, Vivek Utgikar (*Univ of Idaho*), Piyush Sabharwall (*INL*)

Nuclear Installations Safety: General—I,

sponsored by NISD.

Session Organizer: Matthew R. Denman (*SNL*)

Room: Courtland

Functional Failure Analysis for Passive Containment Cooling System in AP1000, Yu Yu, Shengfei Wang, Fenglei Niu (*North China Electric Power Univ*)

Sensitivity Analysis of Ultimate Response Guideline for Kuosheng BWR with MAAP5, Yi-Han Chen, Yuh-Ming Ferng, Bau-Shi Pei, Chun-Kuan Shih (*Natl Tsing Hua Univ*)

The Sojourn Time Approach for Modeling Aging in Passive Components, Askin Guler, Tunc Aldemir, Richard Denning (*Ohio State*)

Performing Probabilistic Risk Assessment Through RAVEN, Andrea Alfonsi, Cristian Rabiti, Diego Mandelli, Joshua J. Cogliati, Robert A. Kinoshita (*INL*)



Updates on Research Reactor Regulation for Instrumentation and Control Systems,

sponsored by HFICD.

Session Organizer: Leroy A Hardin, Jr. (NRC)

Room: Fairlie

This panel discussion will focus on two specific areas of interest to the research and test reactor community. The first area will be a discussion on the instrumentation and control (I&C) system upgrade process for these facilities. In addition, there will be a discussion on the licensing of I&C systems for new facilities. While the emphasis will remain on the I&C systems, potential differences in approaches and other issues for a newly proposed facility versus an operating facility upgrade will be addressed. This panel will present a good opportunity to discuss these issues and others related to research and test reactor I&C systems with the recognized experts in the area.

PANELISTS: to be determined.

Small Modular Reactors: Progression and Status,

sponsored by OPD.

Session Organizer: Thomas A. Remick (Southern California Edison)

Room: Hanover A

Prospects of Small Modular Reactor (SMR) Utilization in Thailand, Vutthi Bhanthumnavin, Ya Min Thu (Shinawatra Univ)

A Study on Safety Characteristics of the MHR-50/100 is for the Severe Accidents—Applicability of the New Safety Standard under Preparation in Japan, Isao Minatsuki (Mitsubishi Heavy Industries), Yorikata Mizokami (MHI)

An Event Classification Schema for Considering Site Risk in a Multi-Unit Nuclear Power Plant PRA, Suzanne Schroer (NRC), Mohammad Modarres (Univ of Maryland)

Online Monitoring in Small Modular Reactors (SMRs), Hashem M. Hashemian, Charbak Mitra, Brent Shumaker (AMS), Belle Upadhyaya (Univ of Tennessee)

Energy Storage Systems for Nuclear Facilities, Kevin L. Lyon, Vivek Utgikar (Univ of Idaho), Piyush Sabharwal (INL)

ADVANTG Tutorial: Automated Variance Reduction for MCNP,

sponsored by RPSD.

Session Organizer: Scott W. Mosher (ORNL)

Room: Hanover B

This three-hour demonstration and tutorial will highlight the capabilities of ADVANTG for generating variance reduction parameters for fixed-source, continuous-energy Monte Carlo transport simulations using MCNP5.

ADVANTG automates the process of generating 3-D space- and energy-dependent weight-window bounds and a consistent biased source distribution based on an approximate transport solution that is efficiently generated by the Denovo 3-D, parallel discrete ordinates package. The code implements the Consistent Adjoint Driven Importance Sampling (CADIS) method for accelerating individual tallies and the Forward-Weighted CADIS method for obtaining relatively uniform uncertainties across tallies in multiple regions and/or energy bins. The variance reduction parameters are generated in a format directly usable by unmodified versions of MCNP. ADVANTG can also be used as a front-end for Denovo and is capable of driving parallel SN calculations. The tutorial will cover the setup and execution of sample radiation detection and shielding problems. The open-source VisIt 3-D visualization software will be used as an integral part of the tutorial. This tutorial will also include a brief summary of our experience applying ADVANTG to simulations of real-world problems, including several radiation detection systems and shielding analyses of the High Flux Isotope Reactor, Spallation Neutron Source, and ITER. ADVANTG will be available from RSICC starting in the first half of 2013. Licensed users are welcome to bring their laptops and follow along.

Reactor Analysis Methods—II,

sponsored by RPD.

Session Organizer: Alexander Stanculescu (INL)

Room: Hanover C

Evaluation of the Effect of Bypass Direct Energy Deposition on Axial Power Predictions in PARCS/PATHS, Peter Yarsky (NRC), Andrew M. Ward (Univ of Michigan)

Development and Testing of HENDL-ADS/MG Cross Section Library for Neutron Energy up to 150MeV, Jun Zou, Qin Zeng, Chong Chen, Zhong Chen (INEST, Chinese Academy of Sciences)

Study on Discontinuity Factor for Angular Flux in Transport Equation, Tatsuya Sakamoto, Tomohiro Endo, Akio Yamamoto (Nagoya Univ)

Comparison of Two Formulations of Continuous-Energy Monte Carlo Local Problem in OLG Iteration Methodology, YuGwon Jo, Nam Zin Cho (KAIST)

Few-Group Macroscopic Cross Section Adjustment for LWRs Using Random Sampling Technique, Akio Yamamoto, Tomohiro Endo, Shinya Kato (Nagoya Univ)

Physics of Fluid-Fuel Systems—I,

sponsored by RPD.

Session Organizer: Piero Ravetto (Politecnico di Torino-Italy)

Room: Hanover D

Contribution to MSR Physics and Chemical Technology Relationship Study, Jan Uhler, Milan Stika, Evzen Losa (UJV Rez - Nuclear Research Institute), invited



Technical Sessions by Day: Thursday

Molten Salt Technology for Very High Flux Research Reactors, Michael J. Eades, Xiaodong Sun, Thomas E. Blue (*Ohio State*), invited

Point Kinetics Models of the Medical Isotope Production Reactor, Christopher Martin Cooling (*Imperial College London*), invited

The Point Kinetic Component of Neutron Noise in an MSR, Imre Pazsit, Victor Dykin (*Chalmers Univ of Technology*)

Space Molten Salt Reactor for Colonization-Level Surface Power, Ethan S. Chaleff, Michael Eades (*Ohio State*), invited

Nuclear Criticality Safety Standards—Forum,

sponsored by NCSD.

Session Organizer: Thomas P. McLaughlin (*Univ of Pittsburgh*)

Room: Hanover E

PANELISTS: to be determined.

Robotics and Remote Systems: General,

sponsored by RRSD.

Session Organizer: Timothy R. McJunkin (*Battelle Energy Alliance-INL*)

Room: Hanover G

Industrial Manipulator Collision Detection Demonstrated Using Motor Current Feedback and Position Control, Kyle A. Schroeder (*LANL*), Mitch W. Pryor (*Univ of Texas, Austin*), Troy Harden (*LANL*)

Automated Design of Robotic/Human Manufacturing Workcells in Radio-active Environments, Joshua M. Williams (*LANL*), Mitch W. Pryor (*Univ of Texas, Austin*)

Robots Reduce Dose, Improve Efficiencies in Standard and Emergency Operations, Daren Cato (*Duke Energy Corp*), Kim S. Monti (*iRobot Corporation*), Floyd Harris (*Duke Energy Corp*), Kevin Derwin (*iRobot Corporation*)

Optimal Placement of CCTV Vault Camera Using Genetic Algorithm, Naghmeh Mansouri (*System and Process Control Hatch Canada*)

Teleoperator System Availability, Reid L. Kress (*BWXT Y-12*)

THURSDAY, JUNE 20, 2013, 1:00 P.M.

State of the Art in Modeling Fuel Rod Ballooning, Fuel Relocation and High Burnup Issues in LOCA Evaluation Models,

sponsored by THD.

Session Organizer: Kurshad Muftuoglu (*GE-Hitachi Nuclear*)

Room: Baker

S-RELAP5 RLBLOCA Evaluation with Clad Swelling, Rupture, and Fuel Relocation, Lisa M. Gerken, C. K. Nithianandan (*AREVA*)

S-RELAP5 Model of Clad Swelling, Rupture, and Fuel Relocation, C. K. Nithianandan, Lisa M. Gerken (*AREVA*)

Nuclear Installations Safety: General—II,

sponsored by NISD.

Session Organizer: Kevin R O’Kula (*URS Professional Solutions LLC*)

Room: Courtland

Evaluation of Downstream Sump Debris Effects on EDF PWR, Champion Gilles (*EDF-SEPTEN*)

Beyond Design Basis Event Pilot Evaluations at U.S. Department of Energy Nuclear Facilities, James B. O’Brien (*DOE*)

Sensitivity Analysis of Ultimate Response Guideline for AP600 with MAAP5, Pin-Yu Yuan, Yuh-Ming Ferng, Bau-Shi Pei, Chun-Kuan Shih (*Natl Tsing Hua Univ*)

Critical Characteristics for Software Commercial Grade Dedication of Safety I&C Systems, Warren Rupert Odess-Gillett (*Westinghouse*)

Instrumentation and Controls: General,

sponsored by HFICD.

Session Organizer: Sacit M. Cetiner (*ORNL*)

Room: Fairlie

Standard for Field Programmable Gate Arrays in the Nuclear Power Industry, Steven A. Arndt (*NRC*)

Analysis of Engineered Safety Feature Network for Lungmen NPS, Teng-Chieh Hsu, Hwai-Pwu Chou (*Natl Tsing Hua Univ*)

Observations on Qualification of Commercial-Grade Software in Digital Instrumentation and Control (I&C) Systems, Rossnyev Alvarado, Timothy Mossman (*NRC*)

Empowering the Nuclear Industry’s Mobile Workforce: Are Exclusion Zones Enough?, Chad J. Kiger (*AMS*)

Harmonizing Regulatory Requirements and Guidelines for Instrumentation and Control Systems, Terry Wayne Jackson, Daniel J. Santos (*NRC*)

An Operator’s Auxiliary System Using Anticipatory Control Scheme, Hsuan-Han Huang, Hwai-Pwu Chou, Bo-Han Lee (*Natl Tsing Hua Univ*)



Accident Tolerant Fuels and Advanced Fuels,

sponsored by MSTD.

Session Organizer: Kenneth J. Geelhood (PNNL)

Room: Hanover B

Mechanical Properties of Zirconium Hydrides Using Microhardness and Nanoindentation, Mohamed S. Elbakhshwan, Jun-Li Lin, Brent Heuser (*Univ of Illinois*)

Uranium-Carbon Nanocomposite Fuels, Chongzheng Na, Haitao Wang, Yong Wang, Aaron Lussier, Ginger Sigmon, Peter C. Burns (*Univ of Notre Dame*)

LWR Fuel Behavior with SiC Cladding, Hangbok Choi (*General Atomics*)

Alloy Development for Advanced Inert-Matrix Nuclear Fuels, Joseph T. McKeown (LLNL), Sangjoon Ahn, Brian Barnhart, Sandeep Irukuvarghula (*Texas A&M*), Mark Wall, Luke L. Hsiung (LLNL), Sean McDevitt (*Texas A&M*), Patrice E. A. Turchi (LLNL)

Development of Metal Fuel Cladding with Vanadium Interdiffusion Barrier for Sodium Cooled Fast Reactor, Kang Soo Lee, Seok Hee Lee (*Yonsei Univ*), Young Soo Yoon (*Gachon Univ*)

Epitaxial Growth of Single Crystal Uranium Oxide Thin Films on TiO_2 , Al_2O_3 , YSZ, ZnO and NdGaO_3 Substrates, Mohamed S. Elbakhshwan, Brent Heuser (*Univ of Illinois*)

New Insights into the Phase Transformations in the U-Np-O System, Melanie Chollet, R. C. Belin, J.-C. Richaud (*CEA*)

Determination of UO_2 Thin Films Mechanical Properties Under Heavy Ion Irradiation, Mohamed S. Elbakhshwan, Yinbin Miao, Brent J. Heuser, James F. Stubbins (*Univ of Illinois*)

A Parametric Analysis for Flow-Induced Vibration of Protective Grid in Operating Condition, Joo Young Ryu, Kyong-Bo Eom, Sang-Youn Jeon, Jung-Min Suh (*KEPCO Nuclear Fuel*)

Physics of Fluid-Fuel Systems—II,

sponsored by RPD.

Session Organizer: Piero Ravetto (*Politecnico di Torino-Italy*)

Room: Hanover D

COUPLE, A Coupled Neutronics and Thermal-Hydraulics Code for Transient Analyses of Molten Salt Reactors, Dalin Zhang (*KIT*), Zhi-Gang Zhai (*Pro-Science, Germany*), Xue-Nong Chen, Shisheng Wang, Andrei Rineiski (*KIT*)

Molten Salt Fast Reactor Transient Analyses with the COUPLE Code, Mariya Brovchenko, Elsa Merle-Lucotte, Daniel Heuer (*LPSC-IN2P3-CNRS/UJF/Grenoble INP*), Andrei Rineiski (*Institute for Nuclear and Energy Technologies, KIT*), invited

Neutronic Evaluations for the EVOL Molten Salt Reactor, Fabio Alcaro, Sandra Dulla, Piero Ravetto (*Politecnico di Torino-Italy*)

Molten Salt Fast Reactor Analyses with SIMMER-III, Shisheng Wang, Andrei Rineiski, Dalin Zhang (*KIT*)

Simulation of Moderated Molten Salt Reactor Transients, Karoly Nagy, Danny Lathouwers (*TU-Delft*), Jan Leen Kloosterman (*Delft University of Technology*), invited

2013
ANS Winter Meeting
& Nuclear Technology Exhibit

November 10-14, 2013

Register today at: ans.org

Omni Shoreham Hotel
Washington D.C.

The poster features a large image of the Washington Monument on the left. To the right, there are two smaller images: the top one shows a large, brightly lit building at night, and the bottom one shows the U.S. Capitol building at night. The American Nuclear Society logo is also present on the right side.



NATIONAL COMMITTEES

Accreditation Policies & Procedures

Sunday, 11 AM - 12:30 PM

Location: Fairlie

ANS Business Meeting

Monday, 3:30 PM - 4:30 PM

Location: Regency VII

Board of Directors

Professional Division Reports

Wednesday, 4:00 PM - 5:30 PM

Location: Regency VII

Board of Directors

Thursday, 8:00 AM - 2:30 PM

Location: Regency VII

Bylaws & Rules

Sunday, 4:30 PM - 6 PM

Location: Edgewood

Finance

Tuesday, 2:00 PM - 7:00 PM

Location: Regency VII

Honors & Awards

Monday, 4:00 PM - 6:00 PM

Location: Auburn

International

Sunday, 11:30 AM - 2:30 PM

Location: Hanover A

Local Sections Workshop

Sunday, 8:00 AM - 12:00 PM

Location: Baker

Membership

Sunday, 11:00 AM - 12:00 PM

Location: Edgewood

National Program Committee (NPC)

Program

Wednesday, 4:00 PM - 6:30 PM

Location: Regency V

Screening & International

Sunday, 10:00 AM - 12:00 PM

Location: Regency V

National Meeting Sub Committee

Wednesday, 11:30 AM - 1:00 PM

Location: Regency V

NEED

Sunday, 7:30 PM - 9:30 PM

Location: Greenbriar

Professional Engineering Exam Committee (PEEC)

Business Meeting

Sunday, 3:00 PM - 4:30 PM

Location: Courtland

PEEC Exam Writers Group

Saturday, 5:00 PM - 10:00 PM

Location: Fairlie

PEEC Exam Writers Group

Monday, 1:00 PM - 9:00 PM

Location: Lenox

Planning

Sunday, 2:00 PM - 6:00 PM

Location: Fairlie

President's Meeting with Committee Chairs

Sunday, 8:00 AM - 9:00 AM

Location: Auburn

President's Meeting with Division Chairs

Sunday, 9:00 AM - 10:00 AM

Location: Auburn

Professional Development Coordination Committee

Tuesday, 7:30 AM - 8:30 AM

Location: Regency VII

Professional Divisions

Committee Meeting

Wednesday, 5:30 PM - 7:00 PM

Location: Lenox

Training Workshop

Saturday, 5:00 PM - 6:30 PM

Location: Dunwoody

Professional Women in ANS

Monday, 11:30 AM - 12:30 PM

Location: Lenox

Public Information

Sunday, 4:00 PM - 6:00 PM

Location: Hanover A

Public Policy

Wednesday, 11:30 AM - 1:30 PM

Location: Lenox

Publications Steering

Book Publishing

Sunday, 11:00 AM - 12:30 PM

Location: Harris

Meetings, Proceedings and Transactions

Sunday, 9:00 AM - 10:00 AM

Location: Fairlie

Nuclear News Editorial Advisory

Sunday, 4:00 PM - 5:30 PM

Location: Inman

NS&E Editorial Advisory

Sunday, 11:00 AM - 12:00 PM

Location: Inman

NT Editorial Advisory

Sunday, 4:30 PM - 5:30 PM

Location: Kennesaw

Publications Steering Committee

Monday, 4:30 PM - 6:30 PM

Location: Greenbriar

Technical Journals

Sunday, 1:00 PM - 4:00 PM

Location: Inman

Scholarship Policy & Coordination

Monday, 12:00 PM - 1:00 PM

Location: Auburn

Student Sections

Executive

Monday, 6:00 PM - 7:00 PM

Location: Regency VII

Reports

Monday, 7:00 PM - 8:00 PM

Location: Regency VII

SPECIAL COMMITTEES

Congressional Fellow Committee

Sunday, 3:00 PM - 4:30 PM

Location: Auburn

Special Committee on Government Relations

Tuesday, 1:30 PM - 3:00 PM

Location: Lenox

Special Committee on Intergration Oversight

Tuesday, 9:00 AM - 11:00 AM

Location: Lenox

OTHER COMMITTEES

8ICI Organizing Committee

Monday, 4:00 PM - 5:30 PM

Location: Regency V



20th PNBC Organizing Committee

Monday, 4:00 PM - 5:00 PM

Location: Harris

CNF

Monday, 7:00 PM - 10:00 PM

Location: Regency V

CCSG

Thursday, 1:00 PM - 4:00 PM

Location: Lenox

Eagle Alliance Board of Directors

Sunday, 1:00 PM - 3:00 PM

Location: Harris

INSC Business Meeting

Saturday, 3:00 PM - 4:00 PM

Location: Edgewood

Joint Benchmark Committee Workshop

Saturday, 6:00 PM - 9:00 PM

Location: Courtland

Mathematics and Computation/Reactor Physics/Radiation Protection & Shielding

Joint Benchmark Meeting

Sunday, 11:00 AM - 1:00 PM

Location: Kennesaw

NEDHO

Sunday, 4:00 PM - 6:00 PM

Location: Hanover B

PSA 2013 Planning Meeting

Monday, 5:30 PM - 7:00 PM

Location: Harris

Pacific Nuclear Council (PNC)

Sunday, 8:30 AM - 5:00 PM

Location: Dunwoody

Risk Management 2013 Organizing Committee

Monday, 6:30 PM - 8:30 PM

Location: Auburn

UWC 2013 Planning Committee

Sunday, 11:30 AM - 12:30 PM

Location: Greenbriar

DIVISION COMMITTEES

Accelerator Applications

Executive

Monday, 11:30 AM - 1:30 PM

Location: Harris

Aerospace Nuclear Science & Technology (ANSTD)

Sunday, 12:00 PM - 2:00 PM

Location: Fairlie

Biology and Medicine

Committee of the Whole

Sunday, 4:00 PM - 5:30 PM

Location: Harris

Computational Medical Physics Working Group

Sunday, 10:00 AM - 11:00 AM

Location: Greenbriar

Joint Program Committee - I&R and B&M

Sunday, 1:30 PM - 2:30 PM

Location: Hanover G

Decommissioning, Decontamination & Reutilization

Executive Committee Meeting

Sunday, 4:30 PM - 5:30 PM

Location: Suite 219

Program Committee Meeting

Sunday, 3:30 PM - 4:30 PM

Location: Suite 219

Education, Training and Workforce Development

Alpha Nu Sigma

Sunday, 1:00 PM - 2:00 PM

Location: Greenbriar

Executive/Membership/Honors & Awards

Sunday, 1:30 PM - 4:30 PM

Location: Edgewood

Program

Sunday, 10:30 AM - 12:00 PM

Location: Fairlie

University/Industry/Government Relations

Sunday, 9:30 AM - 10:30 AM

Location: Edgewood

Environmental Sciences

Special Committee on Sustainability of Nuclear Energy

Sunday, 1:00 PM - 3:00 PM

Location: Courtland

Executive

Sunday, 10:00 AM - 12:00 PM

Location: Courtland

Nuclear Production of Hydrogen Working Group

Sunday, 12:00 PM - 1:00 PM

Location: Courtland

Program

Sunday, 8:30 AM - 9:30 AM

Location: Courtland

Fuel Cycle & Waste Management

Executive

Sunday, 1:00 PM - 2:30 PM

Location: Hanover B

Program

Sunday, 12:00 PM - 1:00 PM

Location: Hanover B

Technical Operating & Standard Committee

Sunday, 2:30 PM - 3:30 PM

Location: Hanover B

Fusion Energy

Executive

Sunday, 3:00 PM - 5:00 PM

Location: Baker

Human Factors, Instrumentation and Controls

Program

Sunday, 11:00 AM - 12:00 PM

Location: Auburn

Executive

Sunday, 12:00 PM - 2:30 PM

Location: Auburn

Isotopes & Radiation

Executive

Sunday, 2:30 PM - 4:00 PM

Location: Hanover A

Joint Program Committee - I&R and B&M

Sunday, 1:30 PM - 2:30 PM

Location: Hanover G

Materials Science and Technology

Executive

Monday, 7:00 PM - 9:00 PM

Location: Edgewood

Mathematics and Computation

Computational Medical Physics Working Group

Sunday, 10:00 AM - 11:00 AM

Location: Kennesaw

Executive

Sunday, 2:00 PM - 4:00 PM

Location: Kennesaw



Program

Sunday, 1:00 PM - 2:00 PM
Location: Kennesaw

Nuclear Criticality Safety

Education Meeting

Sunday, 1:00 PM - 2:00 PM
Location: Hanover E

Executive

Sunday, 3:00 PM - 4:30 PM
Location: Hanover E

Program

Sunday, 2:00 PM - 3:00 PM
Location: Hanover E

Nuclear Installations Safety

Executive

Sunday, 7:30 PM - 9:30 PM
Location: Hanover C

Program

Sunday, 4:00 PM - 6:00 PM
Location: Hanover C

Nuclear Nonproliferation (TG)

Governance

Sunday, 3:00 PM - 4:00 PM
Location: Hanover F

Program

Sunday, 2:00 PM - 3:00 PM
Location: Hanover F

Special Advisory Committee

Sunday, 1:00 PM - 2:00 PM
Location: Hanover F

NURETH – 15

Tuesday, 6:00 PM – 8:00 PM
Location: Greenbriar

Operations and Power

Executive

Sunday, 4:00 PM - 6:00 PM
Location: Hanover D

Nuclear Construction Working Group

Sunday, 12:30 PM - 2:30 PM
Location: Hanover D

Program

Sunday, 2:30 PM - 4:00 PM
Location: Hanover D

Radiation Protection and Shielding

Executive

Sunday, 1:30 PM - 3:30 PM
Location: Baker

Program

Sunday, 12:30 PM - 1:30 PM
Location: Baker

Shielding Standards

Sunday, 12:00 PM - 12:30 PM
Location: Baker

Reactor Physics

Executive

Sunday, 4:00 PM - 6:00 PM
Location: Lenox

Goals & Planning

Sunday, 1:00 PM - 2:00 PM
Location: Lenox

Honors & Awards

Sunday, 10:00 AM - 11:00 AM
Location: Lenox

Program

Sunday, 2:00 PM - 4:00 PM
Location: Lenox

Robotics and Remote Systems

Executive

Sunday, 12:00 PM - 4:00 PM
Location: Hanover C

Thermal Hydraulics

Executive

Sunday, 4:30 PM - 6:00 PM
Location: Greenbriar

Program

Sunday, 2:30 PM - 4:30 PM
Location: Greenbriar

Young Member Group

Executive Committee

Monday, 11:30 AM - 1:00 PM
Location: Edgewood

STANDARDS COMMITTEES

ANS 19

Monday, 8:30 AM – 10:30 AM
Location: Auburn

ANS 19.1

Monday, 10:30 AM – 11:00 AM
Location: Auburn

ANS 19.5

Tuesday, 1:00 PM – 5:00 PM
Location: Auburn

ANS Standards Board

Tuesday, 9:00 AM - 5:00 PM
Location: Regency VI

NFSC

Monday, 8:30 AM - 6:30 PM
Location: Regency VI

TC 85/SC 6

Friday, 9:00 AM - 12:15 PM
Location: Suite 226

TC 85/SC 6/WG 1

Friday, 1:30 PM - 5:00 PM
Location: Suite 226

TC 85/SC 6/WG 2

Friday, 1:30 PM - 5:00 PM
Location: Suite 222

TC 85/SC 6/WG 3

Friday, 1:30 PM - 5:00 PM
Location: Suite 223

TC 85/SC 6/WG 1

Saturday, 9:00 AM - 12:15 PM
Location: Suite 226

TC 85/SC 6/WG 2

Saturday, 9:00 AM - 12:15 PM
Location: Suite 222

TC 85/SC 6/WG 3

Saturday, 9:00 AM - 12:15 PM
Location: Suite 223

TC 85/SC 6

Saturday, 1:30 PM - 4:30 PM
Location: Suite 226



Invest in Your Future

ANS Mentoring Program

Sunday, June 16, 2013

5:00 - 6:00 pm

Location:
Hanover G

The Mentoring Program is a unique opportunity for Mentors to invest in the future by connecting with the next stars (new members, first-time meeting attendees, and student members) of the nuclear industry. It's a chance for those new to the profession to connect with "those in the know," experienced professionals with real-world knowledge to share.

What are the benefits for Mentors and Protégés?

Mentors

- Influence the future
- Keep up to date
- Leave a legacy

Protégés

- Fast track a career
- Get individual attention
- Build a professional relationship

If you are the next star of the nuclear industry or you wish to catch a star, sign up today to participate in the ANS Mentoring Program. You'll be given information to guide you and support from previous program participants. Of course, you'll be connected with someone whose interests match your own with the potential for lifelong learning and friendship.

Yes. I want to be a: _____ **Mentor** _____ **Protégé**

(Please print all information)

Name _____

Company or School _____

Address _____ City / State / Zip _____

Phone _____ Fax _____ Email _____

☐ E-mail mentoring ☐ Mentoring at meetings

Professional Interests:

Please list the Divisions and Committees of which you are, or would like to be, a member:

Please mail, fax, or email this form to:

Membership Department
American Nuclear Society
555 N. Kensington Avenue
La Grange Park, IL 60526

Phone: 800-323-3044 Fax: 708-579-8295 Email: ajiminian@ans.org



ADVANCE MEETING REGISTRATION FORM
2013 ANS ANNUAL MEETING "Next Generation Nuclear Energy: Prospects and Challenges"
JUNE 16 - 20, 2013 • ATLANTA, GA • HYATT REGENCY ATLANTA

FILL OUT COMPLETELY - PLEASE PRINT

ANS ID #: _____

FIRST NAME/MIDDLE INITIAL: _____ **LAST NAME:** _____

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EMAIL: _____

ANS MEMBERS, PLEASE CHECK IF THIS IS YOUR: ☐ **NEW ADDRESS** (WILL CHANGE MEMBER RECORD) OR ☐ **MEETING REGISTRATION ADDRESS ONLY**
PLEASE NOTE: THE INFORMATION THAT YOU PROVIDE WILL BE PRINTED ON THE MEETING REGISTRATION LIST.

PLEASE INDICATE: ☐ **ANS NATIONAL INDIVIDUAL MEMBER** ☐ **ANS FELLOW** ☐ **EMERITUS MEMBER** ☐ **STUDENT**
☐ **NON-MEMBER** ☐ **ORGANIZATION MEMBER REPRESENTATIVE** ☐ **DIVISION OFFICER** ☐ **MEDIA**
☐ **NON-MEMBER INVITED SPEAKER**

SPECIAL ACCOMMODATIONS REQUIRED TO FULLY PARTICIPATE. IF SELECTED ANS WILL CONTACT YOU REGARDING SPECIAL ACCOMMODATIONS ☐ PLEASE CONTACT ME

DIETARY RESTRICTIONS: A) ☐ **VEGETARIAN** B) ☐ **GLUTEN FREE** C) ☐ **VEGAN** D) ☐ **OTHER (MEETING ATTENDEE ONLY)**
DIETARY RESTRICTIONS: A) ☐ **VEGETARIAN** B) ☐ **GLUTEN FREE** C) ☐ **VEGAN** D) ☐ **OTHER (GUEST ONLY)**

FULL MEETING AND YOUNG MEMBER ATTENDEES (PLEASE SELECT)

I WILL ATTEND THE ANS PRESIDENT'S RECEPTION ☐ **YES** ☐ **NO** **MY GUEST WILL ATTEND THE ANS PRESIDENT'S RECEPTION** ☐ **YES** ☐ **NO**

INDIVIDUAL CONFERENCE REGISTRATION - PREREGISTRATION DEADLINE FOR REDUCED FEE IS MAY 24, 2013

	FEES PAID BY (MAY 24, 2013)		FEES PAID AFTER (MAY 24, 2013)	
	ANS NATIONAL MEMBER	NON-MEMBER	ANS NATIONAL MEMBER	NON-MEMBER
FULL ANS MEETING INCLUDES 1 TICKET TO THE ANS PRESIDENT'S RECEPTION	[01] <input type="checkbox"/> \$810	[02] <input type="checkbox"/> \$960*	[10] <input type="checkbox"/> \$910	[11] <input type="checkbox"/> \$1060*
ONE DAY ATTENDANCE DOES NOT INCLUDE TICKET TO THE ANS PRESIDENT'S RECEPTION OR OTHER EVENTS CIRCLE ONE: MON TUES WED THUR	[03] <input type="checkbox"/> \$575	[04] <input type="checkbox"/> \$725	[12] <input type="checkbox"/> \$675	[13] <input type="checkbox"/> \$825
ANS YOUNG MEMBER APPLIES TO MEMBERS 35 YEARS OF AGE OR YOUNGER AND/OR MEMBERS WHO GRADUATED FROM A UNIVERSITY IN 2008 OR LATER. THIS RATE DOES NOT APPLY TO STUDENTS. INCLUDES 1 TICKET TO THE ANS PRESIDENT'S RECEPTION	[05] <input type="checkbox"/> \$600	N/A	[14] <input type="checkbox"/> \$700	N/A
STUDENT DOES NOT INCLUDE TICKET TO THE ANS PRESIDENT'S RECEPTION OR OTHER EVENTS	[06] <input type="checkbox"/> \$125	[07] <input type="checkbox"/> \$175	[15] <input type="checkbox"/> \$175	[16] <input type="checkbox"/> \$225
ANS EMERITUS MEMBER DOES NOT INCLUDE TICKET TO THE ANS PRESIDENT'S RECEPTION OR OTHER EVENTS	[08] <input type="checkbox"/> \$125	N/A	[17] <input type="checkbox"/> \$175	N/A
SPOUSE/GUEST INCLUDES 1 TICKET TO THE ANS PRESIDENT'S RECEPTION & ADMITTANCE TO THE SPOUSE/GUEST HOSPITALITY BREAKFAST ON MONDAY, TUESDAY, & WEDNESDAY - DOES NOT INCLUDE THE TECHNICAL SESSIONS OR OTHER EVENTS	[09] <input type="checkbox"/> \$180		[18] <input type="checkbox"/> \$225	

GUEST NAME (FOR BADGE): _____

**PLEASE REGISTER ON-SITE AFTER TUESDAY,
JUNE 11, 2013**

Name: _____

***ATTENTION NON-MEMBER FULL MEETING REGISTRANTS:**

THE FULL ANS MEETING NON-MEMBER FEE ENTITLES YOU TO A FREE JULY -DEC. 2013 MEMBERSHIP IN THE AMERICAN NUCLEAR SOCIETY. YOU MUST COMPLETE A MEMBERSHIP APPLICATION TO ACTIVATE MEMBERSHIP. AFTER YOUR APPLICATION IS PROCESSED, YOU WILL BE SENT A MEMBERSHIP CARD AND NUCLEAR NEWS MAGAZINE, BEGINNING YOUR BENEFITS. RESIDENTS OUTSIDE OF NORTH AMERICA HAVE THE OPTION TO PAY \$35 FOR NUCLEAR NEWS POSTAGE IF THEY PREFER MAILED ISSUES (THERE IS NO ADDITIONAL CHARGE TO READ NUCLEAR NEWS ONLINE ONLY). THIS OFFER ONLY APPLIES TO THOSE REGISTERED AT THE FULL ANS MEETING RATE.

[75] ☐ I WANT TO BE A MEMBER OF ANS. PLEASE COMPLETE THE ONLINE APPLICATION AT www.ans.org/join/annual

[76] ☐ I DO NOT WANT TO BE A MEMBER OF ANS

SPECIAL EVENTS

SUNDAY, JUNE 16, 2013

ADDITIONAL TICKETS: ANS PRESIDENT'S RECEPTION

[21] # OF TICKETS _____ @ \$85.00 EACH = \$ _____

MONDAY, JUNE 17, 2013

EVENING EVENT: DINNER AT THE HIGH MUSEUM OF ART

[22] # OF TICKETS _____ @ \$85.00 EACH = \$ _____

WEDNESDAY, JUNE 19, 2013

EVENING EVENT: DINNER AT AGATHA'S—A TASTE OF MYSTERY

[23] # OF TICKETS _____ @ \$60.00 EACH = \$ _____

ANS PROFESSIONAL DEVELOPMENT WORKSHOP

PLEASE NOTE: YOU DO NOT HAVE TO BE REGISTERED FOR THE 2013 ANS ANNUAL MEETING TO PARTICIPATE IN THIS PROFESSIONAL DEVELOPMENT WORKSHOP. PDW: "PREPARING FOR THE NUCLEAR ENGINEERING PROFESSIONAL ENGINEERING EXAM," SUNDAY, JUNE 16, 2013.

ANS NATIONAL MEMBER	NON-MEMBER
PAID BEFORE MAY 24, 2013: [50] <input type="checkbox"/> \$400	PAID BEFORE MAY 24, 2013: [51] <input type="checkbox"/> \$500
PAID AFTER MAY 24, 2013 [52] <input type="checkbox"/> \$450	PAID AFTER MAY 24, 2013: [53] <input type="checkbox"/> \$550

MEETING PUBLICATIONS

YOU WILL BE GIVEN THE FOLLOWING PUBLICATION WITH REGISTRATION:

[41] ☐ ANS TRANSACTIONS (VOLUME 108) CONTAINS SUMMARIES FROM THE 2013 ANNUAL MEETING (CD-ROM ONLY)

ADDITIONAL PUBLICATIONS AVAILABLE FOR PURCHASE (AVAILABLE AT SPECIAL REDUCED PRICES AT THE ANS REGISTRATION DESK ONLY):

[44] ☐ I WANT TO PURCHASE A COPY OF THE ANS TRANSACTIONS (VOLUME 108) ON CD-ROM FOR \$85

[45] ☐ I WANT TO PURCHASE A PRINTED COPY OF THE ANS TRANSACTIONS (VOLUME 108) FOR \$55

GRAND TOTAL AND FORM OF PAYMENT

TOTAL OF ALL FUNCTIONS AND EVENTS

GRAND TOTAL: \$ _____

METHOD OF PAYMENT ☐ CHECK ☐ AMERICAN EXPRESS ☐ VISA ☐ MASTERCARD ☐ DINERS CLUB ☐ WIRE TRANSFER

CREDIT CARD NUMBER: _____ EXPIRATION DATE: _____

CARDHOLDER'S SIGNATURE: _____

PRINT CARDHOLDER'S NAME IF DIFFERENT THAN REGISTRANT

PLEASE REGISTER ON-SITE AFTER TUESDAY, JUNE 11, 2013.

MAKE CHECKS PAYABLE TO ANS IN U.S. FUNDS AND MAIL TO ANS REGISTRAR, 97781 EAGLE WAY, CHICAGO, IL 60678-9770. CREDIT CARD REGISTRATIONS MAY BE FAXED TO 708/579-8221. DO NOT MAIL REGISTRATIONS WHICH HAVE BEEN FAXED. SEND BANK FUNDS TRANSFERS TO CHASE BANK, 10. S DEARBORN ST., CHICAGO, IL 60603. BANK PHONE: 312-661-5000. BANK FAX: 312-661-6417. ANS CHECKING ACCOUNT # 824941, BANK ROUTING NUMBER (ABA) 021000021 SWIFTCODE (IBAN) CHASUS33.

PLEASE NOTE: WHEN SENDING SOMETHING TO ANS WITH EXPRESS MAIL OR WITH AN OVERNIGHT SERVICE PROVIDER SUCH AS FedEx, UPS, DHL, ETC., PLEASE USE THE FOLLOWING ADDRESS ONLY: AMERICAN NUCLEAR SOCIETY, 555 NORTH KENSINGTON AVENUE, LaGRANGE PARK, IL 60526, U.S.A. DO NOT USE THE EAGLE WAY ADDRESS IN CHICAGO FOR EXPRESS AND OVERNIGHT MAIL AS IT WILL BE RETURNED TO SENDER AND THIS WILL RESULT IN A PROCESSING DELAY.

REGISTRATION CANCELLATIONS MUST BE MADE IN WRITING PRIOR TO MAY 24TH IN ORDER TO RECEIVE A REFUND MINUS A \$75 PROCESSING FEE. MEETING REGISTRATIONS AND ADDITIONAL TICKETS CANCELED AFTER MAY 24TH WILL NOT BE REFUNDED; HOWEVER, YOU MAY SEND A SUBSTITUTE. PLEASE CONTACT THE ANS REGISTRAR AT

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AECL

ALARON CORPORATION

ALPIQ SUISSE SA

ALTRAN SOLUTIONS CORP.

AMEREN-UE

AMERICAN ELECTRIC POWER SERVICE CORP.

AMERICAN NUCLEAR INSURERS

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NEWPORT NEWS SHIPBUILDING

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PAR NUCLEAR, INC.

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About the American Nuclear Society

The American Nuclear Society (ANS) is an international, not-for-profit, scientific and educational organization consisting of about 11,600 individual members, 1,500 organizations, 90 Organization Members, 20 professional divisions/technical groups 51 U.S. and 9 non-U.S. local sections/affiliated societies, 14 plant branches, and 45 student sections. ANS also maintains about 30 formal agreements for cooperation with international organizations.

The Society's main objectives are the advancement of engineering and science relating to the atomic nucleus, and to the integration of the science and management disciplines constituting nuclear science and technology. Other purposes are to encourage research, establish scholarships, disseminate information, inform the general public about nuclear-related activities, conduct meetings at which scientific and technical papers are presented, and cooperate with government agencies, educational institutions, and other organizations having similar purposes.

