

## OFFICIAL PROGRAM

June 14-18, 2009 • Atlanta, Georgia • Hyatt Regency Atlanta Hotel

# American Nuclear Society: 2009 ANNUAL MEETING

**“Advancing Nuclear Technology  
for a Greater Tomorrow”**



## **EMBEDDED TOPICAL MEETING:**

**Nuclear and Emerging Technologies for Space**  
(NETS—2009; Formerly Space Nuclear Conference)

## **PROFESSIONAL DEVELOPMENT WORKSHOPS:**

**Preparing for the Nuclear Engineering Professional Engineering Exam**  
**Sodium Cooled Fast Reactor Workshop**  
**Modular HTGR Technology Course (2 Day Workshop)**

*our most sincere thanks to the following contributors for their support of the*

**2009 ANS Annual Meeting**

**“Advancing Nuclear Technology for a Greater Tomorrow”**

**Embedded Topical Meeting:**

**Nuclear and Emerging Technologies for Space (NETS-2009, formerly Space Nuclear Conference)**

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**AMERICAN NUCLEAR SOCIETY: 2009 ANNUAL MEETING**

**“Advancing Nuclear Technology for a Greater Tomorrow”**

**EMBEDDED TOPICAL MEETING:**

**Nuclear and Emerging Technologies for Space (NETS-2009, formerly Space Nuclear Conference)**

**June 14-18, 2009 • Atlanta, Georgia • Hyatt Regency Atlanta Hotel**

**UPDATED:  
June 10, 2009**

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*Come join us on Wednesday, June 17, 2009, for dinner at the Fox Theatre/“Jersey Boys”. Additional details are on page 8.*

## MEETING HIGHLIGHTS

### SATURDAY, JUNE 13, 2009

8:00 AM – 5:00 PM Teachers' Workshop  
5:00 PM – 8:00 PM Professional Divisions Workshop

### SUNDAY, JUNE 14, 2009

8:00 AM – 5:00 PM Professional Development Workshop: "Sodium Cooled Fast Reactor Workshop"  
8:30 AM – 5:00 PM Professional Development Workshop: "Preparing for the Nuclear Engineering Professional Engineering Exam"  
1:00 PM – 1:30 PM First-Time Attendees Orientation  
4:00 PM – 5:00 PM Student Assistant Training Session  
5:00 PM – 6:00 PM Mentoring Program  
6:00 PM – 7:30 PM ANS President's Reception

### MONDAY, JUNE 15, 2009

8:00 AM – 10:00 AM Spouse/Guest Hospitality  
8:30 AM – 11:30 AM 2009 ANS Annual Meeting: Plenary Session: "Advanced Nuclear Technology for a Greater Tomorrow"  
9:00 AM – 1:00 PM Spouse/Guest Tour: "Atlanta's Famous Firsts"  
11:30 AM – 1:00 PM Operations and Power Division Luncheon  
12:00 PM – 1:00 PM Green Bag Lunch: "Getting the Word Out: Focus on Teachers"  
1:00 PM – 2:30 PM 2009 ANS Annual Meeting: ANS President's Special Session: "Getting the Word Out – Selected Words"  
1:00 PM – 4:00 PM NETS–2009 Embedded Topical: Opening Plenary: "Nuclear and Emerging Technologies for Space"  
2:30 PM – 4:00 PM 2009 ANS Annual Meeting: Technical Sessions  
4:15 PM – 5:15 PM ANS Business Meeting  
5:45 PM – 10:30 PM Evening Event: "Dinner at the Georgia Aquarium"

### TUESDAY, JUNE 16, 2009

8:00 AM – 10:00 AM Spouse/Guest Hospitality  
8:30 AM – 11:30 AM 2009 ANS Annual Meeting: Technical Sessions  
8:30 AM – 11:30 AM NETS–2009 Embedded Topical: Special Session: "Nuclear Thermal Propulsion Systems"  
9:00 AM – 11:00 AM Utility Integration Oversight  
9:00 AM – 1:00 PM Spouse/Guest Tour: "Cultural Midtown"  
11:30 AM – 1:00 PM ANS Honors and Awards Luncheon  
12:00 PM – 1:00 PM Green Bag Lunch: "Getting the Word Out: Focus on Students"  
12:00 PM – 6:00 PM Utility Liaison Workshop  
1:00 PM – 4:00 PM 2009 ANS Annual Meeting: Technical Sessions  
1:00 PM – 4:00 PM NETS–2009 Embedded Topical: Technical Sessions  
4:00 PM – 6:00 PM Workshop: "Alternative Financing Techniques for Emerging and Mid-Sized Nuclear Companies"

### WEDNESDAY, JUNE 17, 2009

8:00 AM – 10:00 AM Spouse/Guest Hospitality  
8:30 AM – 11:30 AM 2009 ANS Annual Meeting: Technical Sessions  
8:30 AM – 11:30 AM NETS–2009 Embedded Topical: Technical Sessions  
1:00 PM – 4:00 PM 2009 ANS Annual Meeting: Technical Sessions  
1:00 PM – 4:00 PM NETS–2009 Embedded Topical: Technical Sessions  
4:00 PM – 6:00 PM ANS Public Communications Workshop: Focus on Communications – Speaking with the Media  
6:00 PM – 10:30 PM Evening Event: "Dinner at the Fox Theatre/Jersey Boys"

### THURSDAY, JUNE 18, 2009

8:00 AM – 5:00 PM Professional Development Workshop: "Modular HTGR Technology Course"  
8:30 AM – 11:30 AM 2009 ANS Annual Meeting: Technical Sessions  
1:00 PM – 4:00 PM 2009 ANS Annual Meeting: Technical Sessions

### FRIDAY, JUNE 19, 2009

8:00 AM – 5:00 PM Professional Development Workshop: "Modular HTGR Technology Course"  
8:00 AM – 5:00 PM DOE Workshop  
9:00 AM – 6:00 PM Technical Tour: MOX Fuel Fabrication Facility (MFFF)



**GENERAL CHAIR:**  
**Jeffrey T. Gasser**  
*Southern Nuclear Operating Company Inc.*



**CO-GENERAL CHAIR:**  
**Carrie Phillips**  
*Southern Nuclear Operating Company Inc.*



**TECHNICAL PROGRAM CHAIR:**  
**Bojan Petrovic**  
*Georgia Institute of Technology*



**ASSISTANT TECHNICAL PROGRAM CHAIR:**  
**Kurshad Muftuoglu**  
*GE-Hitachi Nuclear Energy*



**ASSISTANT TECHNICAL PROGRAM CHAIR:**  
**Charles R. Martin**  
*Defense Nuclear Facilities Safety Board*



**FINANCE CHAIR:**  
**Matthew Humphrey**  
*Southern Nuclear Operating Company Inc.*



**SPECIAL EVENTS/ SPOUSE HOSPITALITY CHAIR:**  
**Denise Legate**  
*Southern Nuclear Operating Company Inc.*



**STUDENT CHAIR:**  
**Ernest Burnley**  
*Southern Nuclear Operating Company Inc.*

**Mark Your Calendars!**

American Nuclear Society:  
**2009 WINTER MEETING**  
 AND  
**NUCLEAR TECHNOLOGY EXPO**

**November 15-19, 2009**  
**Washington, DC**  
 Omni Shoreham Hotel



**Embedded Topical Meetings:**

- **RISK MANAGEMENT**
- **2009 YOUNG PROFESSIONALS CONGRESS**

**CALL FOR PAPERS** now online:  
[www.ans.org](http://www.ans.org)

**SUMMARY DEADLINE: JUNE 12, 2009**

Visit the ANS home page  
[www.ans.org](http://www.ans.org)  
 for future meetings and more!

# “Advancing Nuclear Technology for a Greater Tomorrow”



Hyatt Regency Atlanta Hotel

## MEETING INFORMATION

The 2009 ANS Annual Meeting will be held June 14-18, 2009, in Atlanta, Georgia. There will be an embedded topical meeting held in conjunction with the 2009 ANS Annual Meeting: Nuclear and Emerging Technologies for Space (*NETS—2009; Formerly Space Nuclear Conference*). There will also be three Professional Development Workshops held in conjunction with the 2009 ANS Annual Meeting: “Preparing for the Nuclear Engineering Professional Engineering Exam;” “Sodium Cooled Fast Reactor Workshop;” and “Modular HTGR Technology Course (2-Day Workshop).”

## ACCOMMODATIONS/ HOTEL INFORMATION

The Hyatt Regency Atlanta Hotel will be the location for the 2009 ANS Annual Meeting, where all activities, technical sessions and governance committee meetings will take place.

## FIRST-TIME ATTENDEE ORIENTATION

The ANS Membership Committee will offer an orientation session for the 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 14, 2009, in the Vinnings Room.

## MENTORING PROGRAM

A special mentoring program will be held from 5:00 p.m. – 6:00 p.m. on Sunday, June 14, 2009, in the Spring Room. 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.

## STUDENT ASSISTANT PROGRAM

Attendance at the 2009 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 14, 2009, 4:00 p.m. – 5:00 p.m. in the Learning Center.

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. 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

## ANS REGISTRATION

ANS Registration will be located in the Centennial Foyer of the hotel on Saturday, June 13, 2009 through Friday, June 19, 2009. Meeting and workshop registration, speakers’ & session chairs’ desk and the message desk will also be located in the ANS registration area.

Meeting registration is required for all attendees and presenters. Badges are required for admission to all technical sessions, workshops and events.

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 the Roswell room.

## NOTICE FOR SPEAKERS

All speakers and session chairs must sign in at the “Speakers’ Desk,” located in the Centennial Foyer of the hotel during registration hours.

A Speakers’ Preview Room, the Edgewood room of the hotel, will be available during the following hours:

SUNDAY, JUNE 14TH  
7:30 A.M. – 3:00 P.M.  
MONDAY, JUNE 15TH  
7:00 A.M. – 4:00 P.M.  
TUESDAY, JUNE 16TH  
7:00 A.M. – 4:00 P.M.  
WEDNESDAY, JUNE 17TH  
7:00 A.M. – 4:00 P.M.  
THURSDAY, JUNE 18TH  
7:00 A.M. – 12:00 P.M.

Audio/visual equipment will be set up; so, that speakers may preview their presentation material.

## CONFERENCE OFFICE

Location: Chicago E & F

## REGISTRATION HOURS:

SATURDAY, JUNE 13TH  
2:00 P.M. – 5:00 P.M.  
SUNDAY, JUNE 14TH  
11:00 A.M. – 7:00 P.M.  
MONDAY, JUNE 15TH  
7:30 A.M. – 5:00 P.M.  
TUESDAY, JUNE 16TH  
7:30 A.M. – 5:00 P.M.  
WEDNESDAY, JUNE 17TH  
7:30 A.M. – 5:00 P.M.  
THURSDAY, JUNE 18TH  
7:30 A.M. – 2:00 P.M.

### \* SUNDAY WORKSHOP ATTENDEES ONLY

Registration for the ANS Professional Development Workshops will take place in the Hanover Foyer, located on the Exhibit Hall Level of the Hyatt Regency Hotel on Sunday, June 14, 2009, 7:00 A.M. - 9:00 A.M.  
NOTE: Only workshop information will be available; all other registrants see times and location above.

## ANS SECRETARIAT

Location: Chicago B, C, D

## ANS MEDIA CENTER

MONDAY, JUNE 15TH  
7:45 A.M. – 4:00 P.M.  
TUESDAY, JUNE 16TH  
8:00 A.M. – 4:00 P.M.

WEDNESDAY, JUNE 17TH  
8:00 A.M. – 4:00 P.M.  
Location: University

## GREEN BAG LUNCH

### “GETTING THE WORD OUT: FOCUS ON TEACHERS”

MONDAY, JUNE 15, 2009  
12:00 P.M. – 1:00 P.M.

Location:  
Executive Conference Suite #223  
Please join us for an interactive discussion of successful techniques for public outreach with K-12 teachers. The discussion will be lead by Public Information Committee Chair Candace Davison and will include information on teacher workshops and presentation materials. Plan on bringing your lunch and trading ideas with other ANS members!

## GREEN BAG LUNCH

### “GETTING THE WORD OUT: FOCUS ON STUDENTS”

TUESDAY, JUNE 16, 2009  
12:00 P.M. – 1:00 P.M.

Location:  
Executive Conference Suite #223

Please join us for an interactive discussion of successful techniques for public outreach with K-12 students. The discussion will be lead by Public Information Committee Vice Chair Dave Pointer and will include information on how to encourage animated classroom discussion and information materials geared toward K-12 students. Plan on bringing your lunch and trading ideas with other ANS members!

#### **“ANS PUBLIC COMMUNICATIONS WORKSHOP”**

WEDNESDAY, JUNE 17, 2009  
4:00 P.M. – 6:00 P.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 15, 2009, through Wednesday, June 17, 2009, in the Woodruff Suite (Room 235). 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. Spouse/guest tours are scheduled. Registration for the tours is separate from the spouse/guest meeting registration.

#### **ATTENTION RUNNERS: ANS FUN RUN**

On Tuesday, June 16, 2009, there will be a noncompetitive run starting at 6:00 a.m. from the front entrance of the hotel. Bring shoes and a big smile.

#### **PROFESSIONAL DEVELOPMENT WORKSHOPS**

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

#### **PROFESSIONAL DEVELOPMENT WORKSHOP:**

**“Preparing for the Nuclear Engineering Professional Engineering Exam”**  
SUNDAY, JUNE 14, 2009  
8:30 A.M. – 5:00 P.M.  
Location: Hanover D

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

#### **PROFESSIONAL DEVELOPMENT WORKSHOP:**

**“Sodium Cooled Fast Reactor Workshop”**  
SUNDAY, JUNE 14, 2009  
8:00 A.M. – 5:00 P.M.  
Location: Hanover C

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

#### **PROFESSIONAL DEVELOPMENT WORKSHOP:**

**“Modular HTGR Technology Course (2-Day Workshop)”**  
THURSDAY, JUNE 18, 2009  
8:00 A.M. – 5:00 P.M.  
Location: Regency VI

FRIDAY, JUNE 19, 2009  
8:00 a.m. – 5:00 p.m.  
Location: Regency VI

*Registration price for the workshop is \$550 for ANS members and \$650 for non-members.*

#### **UTILITY LIAISON WORKSHOP**

TUESDAY, JUNE 16, 2009  
12:00 P.M. – 6:00 P.M.  
Location: Regency VI

#### **WORKSHOP**

**“Alternative Financing Techniques for Emerging and Mid-Sized Nuclear Companies”**  
TUESDAY, JUNE 16, 2009  
4:00 P.M. – 6:00 P.M.  
Location: Regency V

*There is no registration fee for this workshop if you are attending the meeting. Please note that if you plan on attending the workshop only, you may register for the 1-day meeting registration fee on Tuesday, June 16, 2009. Additional details can be found on page 38.*

#### **DOE WORKSHOP**

FRIDAY, JUNE 19, 2009  
8:00 A.M. – 5:00 P.M.  
Location: Regency V

*There is no registration fee for this workshop. Additional details can be found on page 40.*

# ANS Expo 2009

November 15-17, 2009 • Omni Shoreham Hotel • Washington, DC

SUNDAY, 6-7:30pm • MONDAY, 11:30am - 6pm • TUESDAY, 10am - 2pm

The ANS Nuclear Technology Expo will be held in conjunction with the ANS Winter Meeting and Embedded Topical Meetings.

#### • Exhibitors Receive

- One Complimentary Meeting Badge
- One Complimentary Exhibitor Only Badge
- Tickets for ANS President’s Reception
- ANS Expo Guide Listing
- Meeting Program Publicity
- Copy of Meeting TRANSACTIONS

#### • Special Events in the Exhibit Hall

**Sunday** - ANS President’s Reception  
**Monday** - ANS Sponsored Luncheon, Prizes, Welcome Reception  
**Tuesday** - Dessert Bar, Prizes

#### • Over 1000 Attendees Expected

For detailed information, contact Sharon Bohlander at 800.250.3678 x227 or visit our Web site at [www.earlbeckwith.com](http://www.earlbeckwith.com).

## SPECIAL EVENTS

### CONFERENCE LUNCHEONS Operations and Power Division Luncheon

MONDAY, JUNE 15, 2009  
11:30 A.M. – 1:00 P.M.  
LOCATION: Hanover C

Honored at this year's OPD luncheon will be Harold Denton (Consultant and Former Director, NRC Office of Nuclear Reactor Regulation (retired)), the recipient of the Walter H. Zinn Award.

*Tickets can be purchased at the ANS Registration Desk for \$50.*

### Honors and Awards Luncheon

TUESDAY, JUNE 16, 2009  
11:30 A.M. – 1:00 P.M.  
LOCATION: Regency VII

Plan to attend the Honors and Awards Luncheon held to recognize the outstanding efforts of the award winners and to celebrate their accomplishments.

*Tickets can be purchased at the ANS Registration Desk for \$50.*

### EVENING EVENTS

#### PLEASE NOTE:

- *You must be registered for the meeting to attend evening events.*
- *The times listed are departure times and return times to/from the hotel. Busses will depart and return at the Corner of Peachtree and Baker Streets, located at the right front entrance of the Hyatt Regency Atlanta Hotel.*

### ANS President's Reception

SUNDAY, JUNE 14, 2009  
6:00 P.M. – 7:30 P.M.  
LOCATION: Regency Ballroom

The ANS President's Reception kicks off the meeting on Sunday, June 14, 2009. One ticket to the ANS President's Reception is included in the full meeting registration fee.

*Additional tickets can be purchased at the ANS Registration Desk for \$80.*

### Dinner at the Georgia Aquarium

MONDAY, JUNE 15, 2009  
5:45 P.M. – 10:30 P.M.

Located in the heart of downtown Atlanta you will find, the worlds largest Aquarium with over EIGHT MILLION gallons of water and exotic fish and animals from every region of the globe. Your tour of the Aquarium will bring you face to face with Whale Sharks, Manta Rays and African Penguins just a few of the Aquariums current residents.

The "live" entertainment is spectacular to be rivaled only by the evenings catering creations under the direction of world re-nowned chef Wolfgang Puck. We are sure you will enjoy this very special location.

*Tickets can be purchased at the ANS Registration Desk for \$50.*

### Dinner at the Fox Theatre/ "Jersey Boys"

WEDNESDAY, JUNE 17, 2009  
6:00 P.M. – 10:30 P.M.

Your evening will begin with dinner at one of Atlanta's National Historic Landmarks, The Fox Theatre. Originally build in the late 1920's as the Yaarab Temple Shrine Mosque for the Shriners organization. The Fox Theatre is often described as "A monument of picturesque and almost disturbing grandeur beyond imagination".

Following dinner you will be treated to the hit Broadway show "Jersey Boys". A rags to rock to riches tale of four blue collar kids working their way from the streets of Newark to the heights of stardom. Reminisce as we travel down memory lane with renditions of their 13 top ten hits and insight into their exciting journey.



*In the Ocean Voyager gallery at the Georgia Aquarium, you will find the largest aquarium viewing window in North America.*

© Georgia Aquarium



*Garibaldi damselfish is easily distinguished by its bright orange color. Deepo, the Aquarium's mascot, is a garibaldi damselfish.*

© Georgia Aquarium



*Atlanta's Fox Theatre was a beautifully outlandish, opulent, grandiose monument to the heady excesses of the pre-crash 1920's, a mosque-like structure complete with minarets, onion domes, and an interior decor which was even more lavish than its facade.*

*Tickets can be purchased at the ANS Registration Desk for \$55.*

### Atlanta, Georgia—

*"With five million residents and counting, the so-called 'capital of the South' continues to experience explosive growth thanks to southbound Yankees and international immigrants alike. It's also booming as a tourist destination thanks to two glitzy 21st-century attractions – the Georgia Aquarium and the new World of Coca-Cola – plus the arrival of Mei Lan, a giant panda cub at the Atlanta Zoo. Beyond the attractions you'll find a constellation of superlative restaurants, two luxury megamalls, ample Civil War lore, miles of hiking trails and a plethora of African American history."*

— excerpt from *Lonely Planet*



**SPOUSE/GUEST TOURS****Atlanta's Famous Firsts**

MONDAY, JUNE 15, 2009

9:00 AM – 1:00 PM

Georgia is a land of firsts and onlys. Countless people, places and things began their journeys to stardom here. The list of the famous is endless, including everything from geological wonders to pioneers in medicine, politics and agriculture to educational accomplishments galore. Today, you will meet two of the brightest shining stars in the state: Introducing the world's favorite soft drink and the first cable television network on earth, both of whom proudly call Atlanta home.

Over two decades ago, Ted Turner, a relative unknown, had a vision of a "Superstation" that would cover the earth via an underground cable network.

It would provide homes with the best in television programming (both new and vintage), movies, news, weather and sports.

As Turner's Superstation has grown into a Supernetwork, one component of the empire he founded continues to surface as *the* leader in the field.

Introducing your first famous first: Cable News Network. CNN and Headline News have their home in the heart of downtown Atlanta.

Today, you will catch a glimpse of the fast-paced excitement of a 24-hour news broadcast in the making with a tour of *Inside CNN Atlanta*.

You'll view the newsroom, the cameras and lights, and all the other behind-the-scenes places and things the viewing public never sees.

The NEW World of Coca Cola has just recently opened next door to the Georgia Aquarium in the heart of downtown Atlanta! The new and expanded attraction (over twice the size of the previous World of Coca-Cola) will be the only place where you can explore the complete story – past, present and future – of the world's best-known brand.

There's something for visitors of all ages to enjoy, from a thrilling 4D cinematic experience, to the largest collection of Coke memorabilia ever assembled, to the World of Coca-Cola favorite – the tasting experience with over 70 different products to sample. And that's just a glimpse of what the NEW World of Coca Cola has to offer!

*Tickets can be purchased at the ANS Registration Desk for \$63.*

**Cultural Midtown**

TUESDAY, JUNE 16, 2009

9:00 AM – 1:00 PM

Start your day with a visit to the glorious Atlanta Botanical Gardens, a showcase of the most beautiful and unusual flora in our region, located on a 60-acre site in Midtown's Piedmont Park. Take a quiet stroll through the massive hardwood forest or the lovely vegetable, rose or Japanese gardens.

Then feast your senses at the magnificent Dorothy Fuqua Conservatory. Under the glittering glass dome live some of the world's most exotic and glorious plants. They flourish in the conservatory whose mission is to preserve endangered plant life. Myriad species of orchids, palms and ferns grow here in spectacular profusion.

Tropical plants and free-flying birds make up the majority of the exhibit, with Mediterranean and

desert plants and birds complementing their more extravagant cousins. This private world is an oasis of breathtaking beauty you will never forget.

Continue your cultural adventure by enjoying Atlanta's High Museum of Art, which contains the city's best collection of fine art in a spectacular and inspiring setting.

During your visit, guests will have the unique opportunity to visit the High Museum's special exhibition of art from the Louvre.

Louvre Atlanta™ is an unprecedented partnership between the High Museum of Art and the Musée du Louvre in Paris that will bring hundreds of works of art from the Louvre's collections to Atlanta. Built around specific themes and periods, the High will present a series of long-term special presentations of art from the Louvre from October 2006 through September 2009.

The Louvre and the Masterpiece will explore how the definition of a "masterpiece," as well as taste and connoisseurship, have changed over time.

The exhibition will feature ninety-one works of art drawn from all eight of the Musée du Louvre's collection areas, spanning 4,000 years.

Paintings, sculpture, decorative arts, and drawings will reflect three major themes: the changing historical and cultural definitions of a masterpiece; authenticity and connoisseurship; and the evolution of taste and scholarship. The exhibition is divided into three sections which together explore a range of thematic questions about the concept of a masterpiece.

*Tickets can be purchased at the ANS Registration Desk for \$69.*

**TECHNICAL TOUR  
MOX Fuel Fabrication  
Facility  
(MFFF)**

FRIDAY, JUNE 19, 2009

9:00 AM – 6:00 PM

Visitors to MOX will hear an overview of the history of the Savannah River Site, then travel to the construction site of the Mixed Oxide Fuel Fabrication Facility (MFFF). There they will receive an overview and status of the MOX Project by Clay Ramsey, the NNSA Federal Project Director, and Dave Stinson, Shaw AREVA MOX Services President and CEO.

In conclusion, visitors will go on a walking tour of the MFFF construction site, led by Mr. Ramsey and Mr. Stinson.

The maximum number of tour participants is limited to 55 people.

Tickets are no longer available.

*Lunch is included.*

## TECHNICAL SESSIONS BY DIVISION

*(Asterisks indicate special sessions. Parentheses indicate cosponsorship)*

### **Special Sessions**

\*Opening Plenary: Advancing Nuclear Technology for a Greater Tomorrow, Mon. a.m.

\*ANS President's Special Session: Getting the Word Out – Selected Words, Mon. p.m.

### **Accelerator Applications (AAD)**

Accelerator Applications: General, Thurs. a.m.

### **Biology and Medicine (BMD)**

(Neutron Imaging: Neutron Radiography and Neutron Computed Tomography, Tues. a.m.)

(Nuclear Research Reactors: Utilizations and Applications of Nuclear Methods, Tues. p.m.)

Nuclear-Based Imaging for Medical Diagnosis and Therapy—I, Wed. a.m.

Nuclear-Based Imaging for Medical Diagnosis and Therapy—II, Wed. p.m.

### **Decommissioning, Decontamination, and Reutilization (DDR)**

History of Manhattan Era Nuclear Power Facilities, Tues. a.m.

Decommissioning and Decontamination at Commercial Reactor Facilities—Paper/Panel, Tues. a.m.

Groundwater Protection—Panel, Wed. a.m.

Army Corps/FUSRAP: Decommissioning and Decontamination of Nonreactor Sites—Panel, Wed. p.m.

### **Education and Training (ETD)**

Innovations in Nuclear Engineering Education, Tues. p.m.

Issues in Public Education and Communication, Wed. a.m.

New Nuclear Engineering Programs at Colleges and Universities—Panel, Wed. a.m.

Focus on Communications: The Nuclear Story and Other Tales—Panel, Wed. p.m.

Focus on Communications in the New Media—Panel, Wed. p.m.

### **Environmental Sciences (ESD)**

Pete Fledderman Memorial Session, Mon. p.m.

(Groundwater Protection—Panel, Wed. a.m.)

Environmental Sciences: Sustainable Development, Wed. p.m.

(Thermal Aspects of Nuclear Material Handling and Environmental Monitoring, Thurs. p.m.)

### **Fuel Cycle and Waste Management (FCWMD)**

Securing the Renaissance: Responsible Stewardship of the Global Nuclear Enterprise—Panel (in collaboration with the Special Committee on Nuclear Nonproliferation (SCNN), Mon. p.m.)

MOX Gateway: Roadmap to Human Resource Development for the Nuclear Renaissance—Panel (in collaboration with SCNN, Tues. a.m.)

The Waste Isolation Pilot Plant: 10 Years of Operations, Tues. p.m.

Advanced Fuels and Recycle (in collaboration with SCNN, Wed. a.m.)

Export Control Compliance in Emerging Nuclear Markets—Panel (in collaboration with SCNN, Wed. p.m.)

Nonproliferation Technology and Used Fuel Repatriation (in collaboration with SCNN, Thurs. a.m.)

Modeling of Nuclear Fuel Cycles, Thurs. a.m.

Disseminating a Nonproliferation Culture through Education—Panel (in collaboration with SCNN, Thurs. p.m.)

Waste and Used Fuel Management, Thurs. p.m.

### **Human Factors, Instrumentation, and Controls (HFICD)**

Human Factors, Instrumentation, and Controls: General, Mon. p.m.

Digital Instrumentation and Controls Regulatory Issues—Panel, Tues. p.m.

Highlights of NPIC&HMIT 2009, Wed. a.m.

### **Isotopes and Radiation (IRD)**

Isotopes and Radiation: General, Mon. p.m.

Neutron Imaging: Neutron Radiography and Neutron Computed Tomography, Tues. a.m.

Nuclear Research Reactors: Utilizations and Applications of Nuclear Methods, Tues. p.m.

(Nuclear-Based Imaging for Medical Diagnosis and Therapy—I, Wed. a.m.)

(Nuclear-Based Imaging for Medical Diagnosis and Therapy—II, Wed. p.m.)

### **Materials Science and Technology (MSTD)**

Materials Science and Technology: General, Mon. p.m.

Reactor Fuels and Materials, Tues. a.m.

### **Mathematics and Computation (MCD)**

Current Issues in Computational Methods—Roundtable, Mon. p.m.

Transport Methods: General, Tues. a.m.

**Mathematics and Computation (MCD) (continued)**

Mathematical Modeling and Computational Methods, Tues. p.m.  
 (Reactor Analysis Methods—I, Thurs. a.m.)  
 (Reactor Analysis Methods—II, Thurs. p.m.)

**Nuclear Criticality Safety (NCS)**

Advances in Nuclear Criticality Accident Excursion Analysis, Mon. p.m.  
 Integration of Nuclear Criticality Safety into New Facility Design, Tues. a.m.  
 Data, Analysis, and Operations for Nuclear Criticality Safety—I, Tues. a.m.  
 Data, Analysis, and Operations for Nuclear Criticality Safety—II, Tues. p.m.  
 Nuclear Criticality Safety Staff and Operations Interface, Wed. p.m.  
 Nuclear Criticality Safety Standards—Forum, Thurs. a.m.

**Nuclear Installations Safety (NIS)**

Management of Materials Degradation and Life Extension for Older Nuclear Facilities, Tues. a.m.  
 Progress in Regulation of Safety Culture, Tues. p.m.  
 Probabilistic Applications in Nuclear Installations Safety, Wed. a.m.  
 Emerging Issues in Reactor Safety—I, Wed. p.m.  
 Emerging Issues in Reactor Safety—II, Thurs. a.m.

**Operations and Power (OPD)**

Strategies for Attracting, Developing, and Retaining Talent in a Growing Nuclear Industry, Mon. p.m.  
 Living the Renaissance: Status of New Plant Licensing—Panel, Tues. a.m.  
 Modular Construction for Nuclear New Build Projects—Panel, Tues. p.m.  
 Status Report on Readiness for and Implementation of New Construction Inspection—Panel, Wed. a.m.  
 Ensuring the Long-Term Safe and Sustainable Nuclear Energy Option—Panel, Wed. a.m.  
 Operations and Power: General, Thurs. a.m.

**Radiation Protection and Shielding (RPS)**

Current Topics in Radiation Protection and Shielding—Roundtable, Mon. p.m.  
 Radiation Protection and Shielding: General, Tues. a.m.  
 Computational Resources for Radiation Modeling, Tues. p.m.  
 Monte Carlo Dice Seminar, Wed. a.m.  
 NJOY—Tutorial, Wed. p.m.

**Radiation Protection and Shielding (RPS) (continued)**

MCNP Variance Reduction—Tutorial, Thurs. a.m.  
 MCNP/X Depletion/Burnup with VESTA—Tutorial, Thurs. p.m.

**Reactor Physics (RPD)**

Advances in Small- and Medium-Size Reactor Design—I, Mon. p.m.  
 Advances in Small- and Medium-Size Reactor Design—II, Tues. p.m.  
 Advances in Small- and Medium-Size Reactor Design—III, Wed. p.m.  
 Reactor Physics: General, Tues. a.m.  
 Reactor Physics Design, Validation, and Operating Experience, Wed. a.m.  
 Reactor Analysis Methods—I, Thurs. a.m.  
 Reactor Analysis Methods—II, Thurs. p.m.  
 Recent Progress and Applications of Resonance Calculation Method, Thurs. p.m.

**Robotics and Remote Systems (RRS)**

Robotics and Remote Systems Research and Deployment, Thurs. a.m.

**Thermal Hydraulics (THD)**

Computational Thermal Hydraulics—I, Mon. p.m.  
 Computational Thermal Hydraulics—II, Tues. p.m.  
 General Thermal Hydraulics, Tues. a.m.  
 General Two-Phase Flow, Wed. a.m.  
 Rod Bundle Thermal Hydraulics, Wed. p.m.  
 Severe Accidents and Fluid-Structure Interaction, Wed. p.m.  
 Thermal Hydraulics of Advanced Reactors, Thurs. a.m.  
 Thermal Aspects of Nuclear Material Handling and Environmental Monitoring, Thurs. p.m.

**Young Members Group (YMG)**

(Advances in Nuclear Criticality Accident Excursion Analysis, Mon. p.m.)  
 (Integration of Nuclear Criticality Safety into New Facility Design, Tues. a.m.)  
 (Data, Analysis, and Operations for Nuclear Criticality Safety—I, Tues. a.m.)  
 (Data, Analysis, and Operations for Nuclear Criticality Safety—II, Tues. p.m.)  
 (Nuclear Criticality Safety Staff and Operations Interface, Wed. p.m.)  
 (Focus on Communications: The Nuclear Story and Other Tales—Panel, Wed. p.m.)  
 (Focus on Communications in the New Media—Panel, Wed. p.m.)

## CONDENSED SCHEDULE

ROOM	MONDAY, JUNE 15, 2009			TUESDAY, JUNE 16, 2009	
	8:30 AM – 11:30 AM	1:00 PM – 2:30 PM	2:30 PM – 4:00 PM	8:30 AM – 11:30 AM	1:00 PM – 4:00 PM
Centennial 2 and 3	Opening Plenary: Advancing Nuclear Technology for a Greater Tomorrow	ANS President's Special Session: Getting the Word Out— Selected Words			
Baker			Advances in Small- and Medium-Size Reactor Design—I	Reactor Physics: General	Advances in Small- and Medium-Size Reactor Design—II
Courtland			Human Factors, Instrumentation, and Controls: General	Living the Renaissance: Status of New Plant Licensing—Panel	Digital Instrumentation and Controls Regulatory Issues—Panel
Dunwoody			Computational Thermal Hydraulics—I	General Thermal Hydraulics	Computational Thermal Hydraulics—II
Fairlie			Isotopes and Radiation: General	Neutron Imaging: Neutron Radiography and Neutron Computed Tomography	Nuclear Research Reactors: Utilizations and Applications of Nuclear Methods
Greenbriar			Current Topics in Radiation Protection and Shielding— Roundtable	Radiation Protection and Shielding: General	Computational Resources for Radiation Modeling
Inman			Pete Fledderman Memorial Session	Management of Materials Degradation and Life Extension for Older Nuclear Facilities	Progress in Regulation of Safety Culture
Kennesaw			Current Issues in Computational Methods— Roundtable	Transport Methods: General	Mathematical Modeling and Computational Methods
Piedmont			Advances in Nuclear Criticality Accident Excursion Analysis	Integration of Nuclear Criticality Safety into New Facility Design ----- Data, Analysis, and Operations for Nuclear Criticality Safety—I	Data, Analysis, and Operations for Nuclear Criticality Safety—II
Spring			Strategies for Attracting, Developing, and Retaining Talent in a Growing Nuclear Industry	History of Manhattan Era Nuclear Power Facilities ----- Decommissioning and Decontamination at Commercial Reactor Facilities—Paper/Panel	Modular Construction for Nuclear New Build Projects—Panel
Techwood			Securing the Renaissance: Responsible Stewardship of the Global Nuclear Enterprise—Panel	MOX Gateway: Roadmap to Human Resource Development for the Nuclear Renaissance—Panel	The Waste Isolation Pilot Plant: 10 Years of Operations
Hanover A			Materials Science and Technology: General	Reactor Fuels and Materials	Innovations in Nuclear Engineering Education

ROOM	WEDNESDAY, JUNE 17, 2009		THURSDAY, JUNE 18, 2009	
	8:30 AM – 11:30 AM	1:00 PM – 4:00 PM	8:30 AM – 11:30 AM	1:00 PM – 4:00 PM
Baker	Reactor Physics Design, Validation, and Operating Experience	Advances in Small- and Medium-Size Reactor Design—III	Reactor Analysis Methods—I	Reactor Analysis Methods—II ----- Recent Progress and Applications of Resonance Calculation Method
Courtland	Highlights of NPIC&HMIT 2009	Environmental Sciences: Sustainable Development		
Dunwoody	General Two-Phase Flow	Rod Bundle Thermal Hydraulics	Thermal Hydraulics of Advanced Reactors	Thermal Aspects of Nuclear Material Handling and Environmental Monitoring
Fairlie	Nuclear-Based Imaging for Medical Diagnosis and Therapy—I	Nuclear-Based Imaging for Medical Diagnosis and Therapy—II	Operations and Power: General	
Greenbriar	Monte Carlo Dice Seminar	NJOY-Tutorial	MCNP Variance Reduction-Tutorial	MCNP/X Depletion/Burnup with VESTA-Tutorial
Inman	Probabilistic Applications in Nuclear Installations Safety	Emerging Issues in Reactor Safety—I	Emerging Issues in Reactor Safety—II	
Kennesaw	Status Report on Readiness for and Implementation of New Construction Inspection-Panel	Severe Accidents and Fluid-Structure Interaction	Nonproliferation Technology and Used Fuel Repatriation	Disseminating a Nonproliferation Culture Through Education-Panel
Piedmont	Ensuring the Long-Term Safe and Sustainable Nuclear Energy Option-Panel	Nuclear Criticality Safety Staff and Operations Interface	Nuclear Criticality Safety Standards-Forum	
Spring	Groundwater Protection-Panel	Army Corps/FUSRAP: Decommissioning and Decontamination of Nonreactor Sites-Panel	Robotics and Remote Systems Research and Deployment	
Techwood	Advanced Fuels and Recycle	Export Control Compliance in Emerging Nuclear Markets-Panel	Modeling of Nuclear Fuel Cycles	Waste and Used Fuel Management
Hanover A	Issues in Public Education and Communication	Focus on Communications: The Nuclear Story and Other Tales-Panel ----- Focus on Communications in the New Media-Panel	Accelerator Applications: General	
Regency V	New Nuclear Engineering Programs at Colleges and Universities-Panel			

## TECHNICAL SESSIONS BY DAY: MONDAY

### MONDAY • JUNE 15, 2009

7:30 AM – 5:00 PM	<b>MEETING REGISTRATION</b>
8:00 AM – 10:00 AM	<b>SPOUSE/GUEST HOSPITALITY</b>
8:30 AM – 11:30 AM	<b>2009 ANS ANNUAL MEETING: OPENING PLENARY</b> “Advancing Nuclear Technology for a Greater Tomorrow”
9:00 AM – 1:00 PM	<b>SPOUSE/GUEST TOUR</b> “Atlanta’s Famous Firsts”
11:30 AM – 1:00 PM	<b>OPERATIONS AND POWER DIVISION LUNCHEON</b>
1:00 PM – 2:30 PM	<b>2009 ANS ANNUAL MEETING: ANS PRESIDENT’S SPECIAL SESSION</b> “Getting the Word Out – Selected Words”
1:00 PM – 4:00 PM	<b>NETS-2009 EMBEDDED TOPICAL MEETING: OPENING PLENARY</b> “Nuclear and Emerging Technologies for Space”
2:30 PM – 4:00 PM	<b>2009 ANS ANNUAL MEETING: TECHNICAL SESSIONS</b> <ul style="list-style-type: none"><li>• Advances in Small- and Medium-Size Reactor Design—I</li><li>• Human Factors, Instrumentation, and Controls: General</li><li>• Computational Thermal Hydraulics—I</li><li>• Isotopes and Radiation: General</li><li>• Current Topics in Radiation Protection and Shielding—Roundtable</li><li>• Pete Fledderman Memorial Session</li><li>• Current Issues in Computational Methods—Roundtable</li><li>• Advances in Nuclear Criticality Accident Excursion Analysis</li><li>• Strategies for Attracting, Developing, and Retaining Talent in a Growing Nuclear Industry</li><li>• Securing the Renaissance: Responsible Stewardship of the Global Nuclear Enterprise—Panel</li><li>• Materials Science and Technology: General</li></ul>
4:15 PM – 5:15 PM	<b>ANS BUSINESS MEETING</b>
5:45 PM – 10:30 PM	<b>EVENING EVENT:</b> “Dinner at the Georgia Aquarium”

### SPEAKERS:

- “Nuclear Spent Fuel Management: The Legal and Political Realities”  
Edward F. Sproat (*Former DOE Director of the Office of Civilian Radioactive Waste Management*)
- “Spent Fuel Recycling: An Industrial Reality”  
Dominique Greneche (*International Expert, AREVA*)
- “Creating Certainty on New Nuclear Cost and Schedule—The NINA Strategy”  
Steve Winn (*NRG Energy*)
- “Securing the Nuclear Future”  
Laura S. Holgate (*NTI*)

### MONDAY, JUNE 15, 2009 • 2:30 P.M.

**Advances in Small- and Medium-Size Reactor Design—I**, sponsored by RPD. *Session Organizer:* Youssef Shatilla (*MASDAR Inst of Science and Technology*). *Chair:* Youssef Shatilla

#### Baker

##### 2:30 p.m.

Have Deliberately Small Reactors Come of Age?, Daniel T. Ingersoll (*ORNL*)

##### 2:55 p.m.

Small Modular Reactors, U.S. Market and Licensing Possibilities, Richard L. Black (*DOE*)

##### 3:20 p.m.

Small and Medium Sized Reactors—Domestic Benefit in International Deployment?, D. Craig Welling (*DOE*)

##### 3:45 p.m.

IRIS: Reliable SMRs for a Wide Range of Energy Needs, Mario D. Carelli (*Westinghouse*), Bojan Petrovic (*Georgia Inst of Technol*), Marco E. Ricotti (*Politecnico di Milano*)

**Human Factors, Instrumentation, and Controls: General**, sponsored by HFICD. *Session Organizer:* Tyrone Tonkinson (*Westinghouse*). *Chair:* Tyrone Tonkinson

#### Courtland

##### 2:30 p.m.

Ubiquitous System Development for Maintenance Personnel in Nuclear Power Plants, Ho-Bin Yim, In-Kim, Seung-Min Lee, Poong-Hyun Seong (*KAIST*)

##### 2:55 p.m.

Communication Pattern Analysis under Abnormal Conditions in a Main Control Room, Seunghwan Kim, Jinkyun Park (*KAERI*)

##### 3:20 p.m.

Signal Analysis with the Autoregressive Harmonic Analysis, Michael Baleanu (*ISTec GmbH*)

**Computational Thermal Hydraulics—I**, sponsored by THD. *Chair:* Brian G. Woods (*Oregon State Univ*)

#### Dunwoody

##### 2:30 p.m.

URANS Simulation of Parallel Jets Mixing in a Rectangular Confinement, Elia Merzari, Hisashi Ninokata (*Tokyo Inst Technol*)

##### 2:55 p.m.

Numerical Flow Benchmark Model of Advanced Test Reactor Fuel Element Using FLUENT, Wade Marcum, Brian Woods, Brian Jackson (*Oregon State Univ*)

### MONDAY, JUNE 15, 2009 • 8:30 A.M.

**Opening Plenary: Advancing Nuclear Technology for a Greater Tomorrow.** *Cochairs:* Jeffrey T. Gasser, Carrie Phillips (*Southern Nuclear Operating Company*)

#### Centennial 2 and 3

##### 8:30 a.m.

#### WELCOMING REMARKS:

William E. Burchill, Ph.D. (*President, American Nuclear Society*)

#### SPEAKERS:

- Mr. David M. Ratcliffe (*Chairman, President and Chief Executive Officer, Southern Company*)
- Senator (Ret.) Sam Nunn (*Chairman, Center for Strategic International Studies and Chief Executive Officer of the Nuclear Threat Initiative*)
- Vice Admiral (Ret.) John Grossenbacher (*Director, Idaho National Laboratory*)
- The Honorable Dale E. Klein (*Commissioner, U.S. Nuclear Regulatory Commission*)
- Mr. Jim O. Ellis, Jr. (*President and Chief Executive Officer, Institute for Nuclear Power Operations*)

### MONDAY, JUNE 15, 2009 • 1:00 P.M.

**ANS President's Special Session: Getting the Word Out—Selected Words.** *Chair:* William E. Burchill (*President, ANS*)

#### Centennial 2 and 3

##### 1:00 p.m.

The following key topics will be discussed by recognized experts: high-level waste management, fuel reprocessing/recycling, proliferation avoidance, new plant economics, and nuclear environmental and health benefits.

**3:20 p.m.**

Three Dimensional Simulation of RCCS Heat Exchange Using STAR-CCM+ CFD Code, Angelo Frisani, Luigi Capone, Victor Ugaz, Yassin A. Hassan (*Texas A&M*)

**3:45 p.m.**

CFD Simulation of Coolant Flow Distribution in a Pebble Bed Modular Reactor Core, Angelo Frisani, Akshay Gandhir, Yassin A. Hassan, Peng Yin (*Texas A&M*)

**4:10 p.m.**

Effect of Noncondensable Gas in BWR Core Region on LOCA Analysis, Jeffrey D. Rambo, A. Kurshad Muftuoglu (*GE-Hitachi Nuclear Energy*)

**Isotopes and Radiation: General**, sponsored by IRD. *Session Organizer:*

Kenan Ünlü (*Penn State Univ*). *Chair:* Steve LaMont (*LANL*)

**Fairlie**

**2:30 p.m.**

Possibility of a Self-induced Contribution to Nuclear Decays, E. Fischbach, J. B. Buncher, J. H. Jenkins (*Purdue Univ*), D. E. Krause (*Wabash College/Purdue Univ*), R. M. Lindstrom (*NIST*), J. J. Mattes (*Purdue Univ*)

**2:55 p.m.**

Does the Half-Life of a Radioactive Sample Depend on Its Shape?, Richard M. Lindstrom (*NIST*), Ephraim Fischbach, John B. Buncher (*Purdue Univ*), Geoffrey L. Greene (*Univ of Tennessee*), Jere H. Jenkins (*Purdue Univ*), Dennis E. Krause (*Wabash College/Purdue Univ*), Joshua J. Mattes (*Purdue Univ*), Andrew Yue (*Univ of Tennessee*)

**3:20 p.m.**

Are Nuclear Decay Rates Correlated with Solar Activity?, Jere H. Jenkins, Ephraim Fischbach, John B. Buncher (*Purdue Univ*), John T. Gruenwald (*Wabash College*), Dennis E. Krause (*Wabash College/Purdue Univ*), Joshua J. Mattes (*Purdue Univ*)

**3:45 p.m.**

Status Update on the NIFFTE High Precision Fission Cross Section Measurement Program, Eric Burgett, Nolan Hertel (*Georgia Tech*), Tony Hill (*LANL*), Mike Heffner (*LLNL*), Jenn Klay (*Cal Poly*), Uwe Greife (*Colorado School of Mines*), Donald Isenhower, Rusty Towell (*Abilene Christian Univ*), John Baker (*INL*), Steve Grimes, Tom Massey (*Ohio Univ*), Walt Loveland (*Oregon State Univ*)

**Current Topics in Radiation Protection and Shielding—Roundtable**,

sponsored by RPSD. *Session Organizer:* Charlotta Sanders (*UNLV*). *Chair:* Everett Redmond (*NEI*)

**Greenbriar**

**2:30 p.m.**

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 a first-come/first-serve basis. The initial topic will be “Recent Developments with Buildup Factors.” This is meant to be fast, informal, and fun.

**Pete Fledderman Memorial Session**, sponsored by ESD. *Chair:*

Eduardo B. Farfan (*SRNL*)

**Inman**

**2:30 p.m.**

LADTAP-PROB: A Probabilistic Model to Assess Radiological Consequences from Liquid Radioactive Releases, Trevor Q. Foley, Eduardo B. Farfan, G. Timothy Jannik (*SRNL*)

**2:55 p.m.**

The Development of a Simultaneous Environmental Radiation Distribution Display System for a Site and Headoffice, Hee Reyoung Kim, Wannoo Lee, Mun Ja Kang, Kun Ho Chung, Chang Woo Lee, Geun Sik Choi, Mun Hee Han (*KAERI*)

**3:20 p.m.**

Composite Analysis Monitoring Program at the Savannah River Site, K. P. Crapse, B. T. Butcher (*SRNL*), W. T. Goldston (*Savannah River Nuclear Solutions*)

**Current Issues in Computational Methods—Roundtable**, sponsored by

MCD. *Session Organizer:* Todd Palmer (*Oregon State Univ*). *Chair:* Todd Palmer

**Kennesaw**

**2:30 p.m.**

We discuss recent and emerging methods in uncertainty quantification. In particular, we present approaches that combine sampling and sensitivity approaches, reduce the numbers of samples needed for validation, and eliminate the bias. Such methods are based on polynomial chaos expansion with collocation. We state some open questions whose resolution would further advance such methods. We discuss to what extent existing uncertainty information in the physical parameters of nuclear engineering applications is suitable for probabilistic approaches.

**Advanced Computational Methods for Uncertainty Quantification**,

Mihai Anitescu (*ANL*)

**Advances in Nuclear Criticality Accident Excursion Analysis**, sponsored

by NCSD; cosponsored by YMG. *Session Organizer:* Peter Angelo (*Y-12 National Security Complex*). *Chair:* Bonnie Rumble (*ENERCON*)

**Piedmont**

**2:30 p.m.**

Criticality Accident Analysis: Does Your Facility’s Accident Have a Justified Basis?, Thomas P. McLaughlin (*Consultant*)

**2:50 p.m.**

Is 12 “Rad in Air” an Appropriate Quantity for Excessive Dose?, Peter L. Angelo, Ken G. Veinot (*Y-12 NSC*)

**3:10 p.m.**

Modelling of Granular Materials in the FETCH Coupled Criticality Code, Christopher C. Pain, Jefferson L. M. A. Gomes, Matthew D. Eaton, Tony Goddard, Brendan Tollit, Justin Hadi (*Imperial College London*)

**3:30 p.m.**

Criticality Accident Analysis for INL Shielded Hot Cells, Wade Scates (*INL*)

**3:50 p.m.**

Derivation of 2-D Thermoelastic Equations of Motion for a Finite Cylinder, Travis Grove, Robert Kimpland, William Myers (*LANL*)

**Strategies for Attracting, Developing, and Retaining Talent in a Growing**

**Nuclear Industry**, sponsored by OPD. *Chair:* Michael L. Spellman (*Progress Energy*)

**Spring**

**2:30 p.m.**

The Future Nuclear Workforce: “If You Build It Will They Come? If So, from Where?,” John Wheeler (*Energy Nuclear*)

## TECHNICAL SESSIONS BY DAY: MONDAY/TUESDAY

### 2:55 p.m.

Connecting the Dots: A New Generation Igniting the Nuclear Renaissance...Helping Exelon Continue to Excel, Janice Kuczynski, Renu Aggarwal (*Exelon Nuclear*)

### 3:20 p.m.

Developing the Texas Nuclear Workforce of the Future, Clarence Fenner (*South Texas Project*)

### 3:45 p.m.

Nuclear Workforce Planning: Connecting the Dots, Susie Brown (*Progress Energy Carolinas, Inc.*)

**Securing the Renaissance: Responsible Stewardship of the Global Nuclear Enterprise—Panel**, sponsored by FCWMD (in collaboration with SCNN). *Session Organizer:* Raymond J. Juzaitis (*Texas A&M Univ.*). *Cochairs:* Raymond J. Juzaitis, Joan Rohlfing (*Nuclear Threat Initiative*)

### Techwood

#### 2:30 p.m.

Attaining global energy security in harmony with nuclear security in the 21st century will demand an explicit program of technology developments (risk-informed nuclear reactor, nuclear materials, and fuel cycle designs; safeguards by design) aligned with transformative policy and diplomatic initiatives (e.g., international nuclear fuel banks, regional fuel cycle centers) and appropriate institutional priorities (physical security, export controls) to ensure a broad-based expansion of nuclear power consistent with a world moving away from a nuclear “tipping point.” This is especially timely with the approach of the 2010 NPT Review Conference. At the dawn of a new Administration, a special invited panel, cohosted by the American Nuclear Society and the Nuclear Threat Initiative, will explore issues at the technology/policy interface associated with proliferation resistance on a “system scale,” as well as the imperative to control and account for fissile materials on a global scale.

#### PANELISTS:

- Robert A. Bari (*BNL*)
- William Charlton (*Texas A&M Univ*)
- Corey Hinderstein (*Nuclear Threat Initiative*)
- Caroline Jorant (*AREVA*)
- Edward McGinnis (*DOE*)
- Adam Stulberg (*Georgia Tech*)

**Materials Science and Technology: General**, sponsored by MSTD. *Session Organizer:* Kenneth Geelhood (*PNNL*). *Chair:* Travis Knight (*Univ of South Carolina*)

### Hanover A

#### 2:30 p.m.

Plastic Instability and Failure in Irradiated Materials, Thak Sang Byun (*ORNL*), Jin Weon Kim (*Chosun Univ—Korea*)

#### 2:55 p.m.

Diffusion Bonding in Compact Heat Exchangers, David Southall [*Heatric Division of Meggitt (UK) Ltd.*]

#### 3:20 p.m.

THERPRO: The IAEA Thermophysical Material Properties Database, Sama Bilbao y León, Seong Gyun Moon (*IAEA—Austria*)

#### 3:45 p.m.

Implementation of Imperfection Modeling Approach for Fuel Cladding Material Characterization, Elizabeth Stephens, Curt Lavender, Richard Davies (*PNNL*)

## TUESDAY • JUNE 16, 2009

7:30 AM – 5:00 PM MEETING REGISTRATION

8:00 AM – 10:00 AM SPOUSE/GUEST HOSPITALITY

8:30 AM – 11:30 AM 2009 ANS ANNUAL MEETING: TECHNICAL SESSIONS

- Reactor Physics: General
- Living the Renaissance: Status of New Plant Licensing—Panel
- General Thermal Hydraulics
- Neutron Imaging: Neutron Radiography and Neutron Computed Tomography
- Radiation Protection and Shielding: General
- Management of Materials Degradation and Life Extension for Older Nuclear Facilities
- Transport Methods: General
- Integration of Nuclear Criticality Safety into New Facility Design
- Data, Analysis, and Operations for Nuclear Criticality Safety-I
- History of Manhattan Era Nuclear Power Facilities
- Decommissioning and Decontamination at Commercial Reactor Facilities—Paper/Panel
- MOX Gateway: Roadmap to Human Resource Development for the Nuclear Renaissance—Panel
- Reactor Fuels and Materials

8:30 AM – 11:30 AM NETS-2009 EMBEDDED TOPICAL MEETING: SPECIAL SESSION:

“Nuclear Thermal Propulsion Systems”

9:00 AM – 1:00 PM SPOUSE/GUEST TOUR

“Cultural Midtown”

11:30 AM – 1:00 PM ANS HONORS AND AWARDS LUNCHEON

1:00 PM – 4:00 PM 2009 ANS ANNUAL MEETING: TECHNICAL SESSIONS

- Advances in Small- and Medium-Size Reactor Design—II
- Digital Instrumentation and Controls Regulatory Issues—Panel
- Computational Thermal Hydraulics—II
- Nuclear Research Reactors: Utilizations and Applications of Nuclear Methods
- Computational Resources for Radiation Modeling
- Progress in Regulation of Safety Culture
- Mathematical Modeling and Computational Methods
- Data, Analysis, and Operations for Nuclear Criticality Safety-II
- Modular Construction for Nuclear New Build Projects—Panel
- The Waste Isolation Pilot Plant: 10 Years of Operations
- Innovations in Nuclear Engineering Education

1:00 PM – 4:00 PM NETS-2009 EMBEDDED TOPICAL MEETING: TECHNICAL SESSIONS (see page 32)

4:00 PM – 6:00 PM WORKSHOP:

“Alternative Financing Techniques for Emerging and Mid-Sized Nuclear Companies”

## TUESDAY, JUNE 16, 2009 • 8:30 A.M.

**Reactor Physics: General**, sponsored by RPD. *Session Organizer:* Fausto Franceschini (*Westinghouse*). *Chair:* Zhaopeng Zhong (*ANL*)

### Baker

#### 8:30 a.m.

Spatial Correction to Reactivity from Area-Ratio Measurements, Yan Cao, John C. Lee (*Univ of Michigan*)

#### 8:55 a.m.

Spatial Correction to the MUSE-4 Area-Ratio Experimental Data, Yan Cao, John C. Lee (*Univ of Michigan*)

#### 9:20 a.m.

Measurement of the Total Inelastic Scattering Cross Section of Graphite Using 9 Angstrom Neutrons, A. I. Hawari, T. Zhou, P. R. Huffman (*NCSU*)



**9:45 a.m.**

Measurement of the Thermal Absorption Cross Section in Lucite, Rene Sanchez, David Hayes, Travis Grove, Jesson Hutchison, Jennifer Ong, Fredrick Tovesson (*LANL*)

**10:10 a.m.**

Power-Ratio Measurements with Burnt Fuel Samples Using Delayed Neutrons, K. A. Jordan, G. Perret, M. F. Murphy (*Paul Scherrer Inst*)

**10:35 a.m.**

Inverse Kinetics for Subcritical Systems, Daniel A. P. Palma (*IFRJ - Instituto Federal do Rio de Janeiro*), Aquilino S. Martinez, Alessandro C. Gonçalves (*COPPE - Universidade Federal do Rio de Janeiro*)

**Living the Renaissance: Status of New Plant Licensing—Panel**, sponsored by OPD. *Session Organizer:* Sandra Sloan (*AREVA*). *Chair:* Sandra Sloan

**Courtland**

**8:30 a.m.**

Leaders in the nuclear industry have been speaking for several years about the nuclear renaissance. This session will provide an overview of the status and practical realities of a key element of the renaissance—new plant licensing. The U.S. Nuclear Regulatory Commission (NRC) is reviewing several design certification applications, as well as many Combined Operating License applications. This session will address the status of those reviews, technical challenges, process issues, and legal aspects related to hearings and interventions.

**PANELISTS:**

- Greg Gibson (*Unistar Nuclear*)
- Peter Hastings (*Duke Energy*)
- Andrea Sterdis (*TVA*)
- Dave Matthews (*NRC*)

**General Thermal Hydraulics**, sponsored by THD. *Chair:* Yassin Hassan (*Texas A&M*)

**Dunwoody**

**8:30 a.m.**

Optimized Design for Critical Heat Flux Experiment Using Downward-Facing Hemisphere, Jin S. Hwang, Kune Y. Suh (*Seoul Natl Univ*)

**8:55 a.m.**

A Thermal Evaluation of a Prototypical Double Walled Dry Storage Cask, J. P. Spring, L. A. Kern, J. M. Cimbala, L. E. Hochreiter (*Penn State*), V. Bilovsky, K. K. Niyogi (*Holtec Intl*)

**9:20 a.m.**

Gamma Radiation-Induced Hydrophilicity Enhancement of Aluminum Surfaces, A. C. Bakken, R. P. Taleyarkhan (*Purdue Univ*)

**9:45 a.m.**

One Dimensional Boiling Heat Transfer Model in Thick Porous Deposits, Ling Zou, B. G. Jones (*Univ of Illinois*)

**10:10 a.m.**

CFD Analysis of Heat Transfer Enhancement in Supercritical Water Channels, M. T. Kao, Y. M. Ferng, M. Lee, C. C. Chieng (*Natl Tsing Hua Univ*)

**10:35 a.m.**

Flash Distillation of Overazeotropic H<sub>2</sub>O Phase Based on Optimal Bunsen Reaction in I-S cycle, Ho Joon Yoon, Hee Cheon No, Young Soo Kim, Hyung Gon Jin (*KAIST*)

**11:00 a.m.**

Real Time RELAP5-3D Models in 3KEYMASTER Environment, I. Arshavsky, V. Spevak, V. Nosatov, V. Galkin (*Western Services Corp*)

**Neutron Imaging: Neutron Radiography and Neutron Computed Tomography**, sponsored by IRD; cosponsored by BMD. *Session Organizer:* Jack S. Brenizer (*Penn State Univ*). *Chair:* R. Gregory Downing (*NIST*)

**Fairlie**

**8:30 a.m.**

Investigation of Coded Neutron Imaging at the N.C. State University PULSTAR Reactor, Z. Xiao, K. K. Mishra, A. I. Hawari (*NCSU*), H. Z. Bilheux, P. R. Bingham, K. W. Tobin (*ORNL*)

**8:55 a.m.**

Status of the Texas Neutron Imaging Facility, S. R. Biegalski (*Univ of Texas, Austin*), L. Cao (*NIST*), M. Deinert, W. Wilson, D. S. O’Kelly, R. Kapsimalis (*Univ of Texas, Austin*), invited

**9:20 a.m.**

Thermal and Cold Neutron Counting with Microchannel Plates, A. S. Tremsin (*Univ of California, Berkeley*), W. B. Feller (*Nova Scientific, Inc*), invited

**9:45 a.m.**

Direct Measurement of Temperature Gradient Driven Flow in Polymer Electrolyte Fuel Cells Using Neutron Imaging, S. Kim, M. C. Hatzell, A. K. Heller, M. M. Mench (*Penn State*), invited

**10:10 a.m.**

Results of Neutron Computed Tomography Water Quantification, A. K. Heller, L. Shi, M. M. Mench, J. S. Brenizer (*Penn State*)

**10:35 a.m.**

Feasibility of Vapor-liquid Contactor Studies via Neutron Tomography, D. S. Hussey (*NIST*), S. A. Owens, R. B. Eldridge (*Univ of Texas, Austin*), invited

**11:00 a.m.**

The Use of Webcam for Neutron Imaging, L. Cao, R. Bindel (*NIST*)

**Radiation Protection and Shielding: General**, sponsored by RPSD. *Session Organizer:* Charlotta Sanders (*UNLV*). *Chair:* Robert Hayes (*WIPP*)

**Greenbriar**

**8:30 a.m.**

Assessing Inhaled Contamination Following a Radiological Dispersal Device Using NaI(Tl) Detectors, S. Dewji, N. Hertel, E. Burgett, M. Bellamy (*Georgia Tech*)

**8:55 a.m.**

Finalized Collimator Design for the LANSCE 90L Flight Path, Eric Burgett, Nolan Hertel (*Georgia Tech*), Tony Hill (*LANL*)

**9:20 a.m.**

Secondary Particles Effect on Linear Energy Transfer, Jamie A. Anderson, Lawrence W. Townsend, Youssef Charara (*Univ of Tennessee*)

## TECHNICAL SESSIONS BY DAY: TUESDAY

### 9:45 a.m.

Triaging Internal Contamination Following an RDD Using the Canberra Inspector 1000, Eric Burgett, Nolan Hertel (*Georgia Tech*)

### 10:10 a.m.

Generalized Dietary Habit Data for Radiological Assessment in Korea, Gab-Bock Lee, Yang-Geun Chung (*KEPRI*), Young-Sik Jang (*KHNP*), Jong-Yi Moon (*KINS*)

### 10:35 a.m.

OEDIPE Software: Biokinetics Within Voxel Phantoms for Internal Dosimetry, S. Lamart, D. Broggio, E. Blanchardon, D. Franck (*Institut de Radioprotection et de Sûreté Nucléaire*), invited

### 11:00 a.m.

Simulation Study of Radiation Dose Calculation from Cosmic Ray Muons at Sea Level, Pushpa Wijesinghe (*Arizona State Univ*), Xiaochun He (*Georgia State Univ*), invited

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**Management of Materials Degradation and Life Extension for Older Nuclear Facilities**, sponsored by NISD. *Session Organizers:* Herbert W. Massie, Jr. (*DNFSB*), Amy B. Hull (*NRC*). *Chair:* Anthony J. Baratta (*NRC*)

### Inman

#### 8:30 a.m.

A Simple Plan for Life Extension of Older Nuclear Facilities, Herbert W. Massie, Jr. (*DNFSB*)

#### 8:55 a.m.

Integrated Facility Aging Management Program at the Savannah River Site, James L. Hendrix, Craig W. McMullin (*Savannah River Nuclear Solutions*)

#### 9:20 a.m.

High Level Waste Tank Integrity Program at SRS, L. Zull, H. Massie, Jr., R. Robinson, E. Rozek, W. Yeniscavich (*DNFSB*)

#### 9:45 a.m.

Short Range Wireless Sensor Networks for Proactive Health Monitoring of Aging Nuclear Power Plants, Phani Teja Kuruganti, Wayne Manges, Stephen Smith (*ORNL*), Davis Shull (*SRNL*)

#### 10:10 a.m.

Korean PMMD: Approach and Prospect, Il Soon Hwang (*Seoul Natl Univ*), Suk Chull Kang (*KINS*), Jun Hwa Hong (*KAERI*), Ho Sang Shin (*KINS*), Changheui Jang (*KAIST*), Young Suk Kim (*KAERI*)

#### 10:35 a.m.

Proactive Materials Degradation Management Program in Japan, T. Shoji, Y. Takeda, Q. Peng (*Tohoku Univ*), J. Kuniya (*Intelligent Cosmos Research Inst*), F. P. Ford (*GE-Global Research Center, Retired*), P. M. Scott (*AREVA*)

#### 11:00 a.m.

Proactive Management of Materials Degradation—A Review of Principles and Programs, L. J. Bond, S. R. Doctor, T. T. Taylor (*PNNL*), A. B. Hull, S. N. Malik (*NRC*)

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**Transport Methods: General**, sponsored by MCD. *Session Organizer:* Todd Urbatsch (*LANL*). *Chair:* Yousry Azmy (*NCSU*)

### Kennesaw

### 8:30 a.m.

Jacobian-Free Newton-Krylov as an Alternative to Power Iterations for the k-Eigenvalue Transport Problem, D. F. Gill (*Penn State*), Y. Y. Azmy (*NCSU*)

### 8:55 a.m.

Applying the Kernel Density Flux Estimator to Estimate Flux at a Point, Kaushik Banerjee, William R. Martin (*Univ of Michigan*)

### 9:20 a.m.

Adjoint-Weighted Kinetics Parameters with Continuous Energy Monte Carlo, Brian C. Kiedrowski (*Univ of Wisconsin, Madison*), Forrest Brown (*LANL*)

### 9:45 a.m.

History-Based Batch Method for a Real Variance Estimation in Monte Carlo Eigenvalue Calculations, Hyung Jin Shim, Yonghee Kim (*KAERI*), Chang Hyo Kim (*Seoul Natl Univ*)

### 10:10 a.m.

Improving the Mesh Generation Capabilities in the SCALE Hybrid Shielding Analysis Sequence, Ahmad M. Ibrahim (*Univ of Wisconsin, Madison*), Douglas E. Peplow, Thomas M. Evans, John C. Wagner (*ORNL*), Paul P. H. Wilson (*Univ of Wisconsin, Madison*)

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### Integration of Nuclear Criticality Safety into New Facility Design

sponsored by NCSU; cosponsored by YMG. *Session Organizer:* Lon Paulson (*GE-Hitachi Nuclear Energy*). *Chair:* Larry Wetzel (*B&W NOG*)

### Piedmont

#### 8:30 a.m.

Criticality Safety Refinement at the MOX Fuel Fabrication Facility, James J. Bazley, Michael J. Shea, Robert G. Foster (*Shaw AREVA MOX Services, LLC*)

#### 8:55 a.m.

Integrating Criticality Safety into Design of <sup>233</sup>U Downblending Process, Karla R. Elam, Linda L. Gilpin (*SpectraTech Inc*), Billy W. Starnes (*Strata-G*)

#### 9:20 a.m.

An Estimate of Minimum Critical Water Content for 10% Enriched UF<sub>6</sub> in 30-inch and 48-inch Diameter UF<sub>6</sub> Cylinders, Lon E. Paulson, James. F. Degolyer (*GE-Hitachi Nuclear Energy*)

#### 9:45 a.m.

Integration of NCS into the CMRR Nuclear Facility, Douglas G. Bowen (*LANL*)

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### Data, Analysis, and Operations for Nuclear Criticality Safety—I

sponsored by NCSU; cosponsored by YMG. *Session Organizer:* Nichole Ellis (*Ellis Nuclear Eng*). *Chair:* Nichole Ellis

### Piedmont

#### 10:15 a.m.

Restart of the Sandia Pulsed Reactor Facility Critical Experiments, G. A. Harms, J. T. Ford, A. D. Barber (*SNL*)

#### 10:40 a.m.

Analysis of Enriched Uranyl Nitrate in Nested Annular Tank Array, John D. Bess, James D. Cleaver (*INL*)

**11:05 a.m.**

PARANAL: An Efficient Tool for Parametric Analysis of Criticality Safety, Qi Ao (*GE-Hitachi Nuclear Energy*)

*NOTE: This session will immediately follow the preceding session, which will begin at 8:30 a.m.*

**History of Manhattan Era Nuclear Power Facilities**, sponsored by DDRD. *Session Organizer:* John E. Gunning (*ORNL*). *Chair:* John E. Gunning

**Spring**

**8:30 a.m.**

Capturing the Hanford Historical Record, Michele S. Gerber (*Fluor Hanford*)

**8:50 a.m.**

Decommissioning the Manhattan Project: Historic Preservation at Los Alamos, Ellen D. McGehee (*LANL*)

**9:10 a.m.**

Saving K-25: The Challenges of Preserving Manhattan Project Sites for the Future, Wm. J. Wilcox, Jr. (*Partnership for K-25 Preservation*), Edith Dunn (*Consultant*), invited

**9:30 a.m.**

A Brief History of the Y-12 National Security Complex, D. Ray Smith (*Y-12 NSC*)

**Decommissioning and Decontamination at Commercial Reactor Facilities—Paper/Panel**, sponsored by DDRD. *Session Organizer:* John W. Bowen (*Mega-Tech Services*). *Chair:* John W. Bowen

**Spring**

**PAPER**

**9:55 a.m.**

Decommissioning the Dounreay Site in Scotland, UK, Alastair MacDonald (*UKAEA*)

**PANEL DISCUSSION**

**10:15 a.m.**

This session will take a specific look at the decommissioning of commercial reactor facilities; this session will address ongoing unique challenges as well as address emerging issues that can affect future decommissioning activities at these facilities.

**PANELISTS:**

- Erhard W. Koehler (*U.S. Department of Transportation*)
- Danny Swindle (*Sargent and Lundy*)
- Tom Magette (*EnergySolutions*)

*NOTE: This session will immediately follow the preceding session, which will begin at 8:30 a.m.*

**MOX Gateway: Roadmap to Human Resource Development for the Nuclear Renaissance—Panel**, sponsored by FCWMD; cosponsored by ETD (in collaboration with SCNN). *Session Organizer:* Carl Mazzola (*Shaw Environmental*). *Chair:* Carl Mazzola

**Techwood**

**8:30 a.m.**

The Mixed Oxide Fuel Fabrication Facility (MFFF) is well into its second full year of construction at the Savannah River Site (SRS). As a U.S. Nuclear Regulatory Commission (NRC)-licensed facility, it is encountering human resource and qualified supplier barriers, in part as a result of the long dormancy of nuclear facility construction in the United States. As an entry project for the nuclear renaissance, the importance of overcoming these barriers cannot be overstated. To address the human resource limitations, the National Nuclear Security Administration (NNSA) and Shaw AREVA MOX Services has instituted a MOX Gateway program that reaches back into the local high schools to establish education curricula and training that yields a solution to the human resource needs, as well as to provide hope to local communities adversely affected by economic stresses. This session provides a forum to discuss underlying issues and to showcase a program that provides solutions.

**PANELISTS:**

- Dave Stinson (*Shaw AREVA MOX Services*)
- Danny Black (*South Carolina Tri-County Alliance*)
- Susan Winsor (*Aiken Technical College*)
- Gwen Nalls (*Shaw AREVA MOX Services*)
- Ken Lewis (*South Carolina State Univ*)
- Clay Ramsey (*NNSA/SR*)

**Reactor Fuels and Materials**, sponsored by MSTD. *Session Organizer:* Kenneth Geelhood (*PNNL*). *Chair:* Kenneth Geelhood

**Hanover A**

**8:30 a.m.**

Xenon Diffusion in Uranium Nitride with 0.1 MWd/t-U of a Burnup, Heemoon Kim (*KAERI*), Kwangheon Park (*Kyung Hee Univ*), Jae Won Lee, Ho Jin Ryu, Geun Il Park, Sang Youl Baek, Sang Bok Ahn, Woo-Seog Ryu (*KAERI*)

**9:00 a.m.**

Evaluation of Linear-Power-to-Melting of Fast Reactor Metal Fuel, Takanari Ogata (*CRIEPI-Japan*), Tomoyasu Mizuno (*Japan Atomic Energy Agency*)

**9:30 a.m.**

Pilot Project for Irradiation Testing of Materials at the ATR-National Scientific User Facility, Heather J. MacLean (*INL*), Kumar Sridharan, Yong Yang, Lizhen Tan, Tyler Gerczak, Todd R. Allen (*Univ of Wisconsin, Madison*)

**10:00 a.m.**

Mesoscale Simulation of Fission Gas Transport Phenomena in LWR Fuels, Veena Tikare, Elizabeth Holm (*SNL*), Pavel Medvedev (*INL*)

**10:30 a.m.**

Sample Preparation of U-Zr Fuel Alloys for TEM Analysis, Kathryn W. Mews, Sean McDevitt (*Texas A&M*)

**11:00 a.m.**

Structural Strength of Oxidized Graphite Column During the Air-Ingress Accident in VHTR, Byung Ha Park, Hee Cheon No (*KAIST*), Eung Soo Kim, Chang H. Oh (*INL*)

## TECHNICAL SESSIONS BY DAY: TUESDAY

TUESDAY, JUNE 16, 2009 • 1:00 P.M.

**Advances in Small- and Medium-Size Reactor Design—II**, sponsored by RPD. *Session Organizer:* Youssef Shatilla (*MASDAR Inst of Science and Technology*). *Chair:* Youssef Shatilla

### Baker

**1:00 p.m.**

A Soluble Boron-Free Core Design for the IRIS-50, Fausto Franceschini (*Westinghouse*), Bojan Petrovic (*Georgia Tech*)

**1:25 p.m.**

Isotopic Composition of 4.95% and 8.0% Enriched Fuel Irradiated at MASLWR Operational Conditions, Alexey Soldatov, Todd S. Palmer (*Oregon State Univ*)

**1:50 p.m.**

Comparison of Kinetic Parameters of 8.0% Enriched MASLWR Fuel with Conventional PWR Fuel, Alexey Soldatov, Todd S. Palmer (*Oregon State Univ*)

**2:15 p.m.**

Fission Product Inventory of PRISM Reactor Discharged Fuel for Actinide Burner Core Design, Brett Dooies, Andrew Caldwell, Eric Loewen (*GE-Hitachi Nuclear Energy*)

**2:40 p.m.**

Electricity Production and Water Desalination Using IRIS Reactor, Gustavo Alonso, Samuel Vargas (*Instituto Nacional de Investigaciones Nucleares*), Edmundo del Valle (*Instituto Politecnico Nacional*)

**3:05 p.m.**

Enhancing the Power Density of IRIS by Using Compact Steam Generators, Koroush Shirvan, Pavel Hejzlar, Mujid Kazimi (*MIT*), Youssef Shatilla (*MASDAR Inst of Science and Technol*)

**3:30 p.m.**

A Superheated Boiling Water Reactor with Annular Fuel Elements, Yu-Chih Ko, Pavel Hejzlar, Mujid S. Kazimi (*MIT*)

**Digital Instrumentation and Controls Regulatory Issues—Panel**, sponsored by HFICD; cosponsored by OPD. *Session Organizer:* Edward Quinn (*Consultant*). *Cochairs:* Richard Wood (*ORNL*), Edward Quinn

### Courtland

**1:00 p.m.**

This panel session focuses on current developments regarding key regulatory issues for safety-related application of digital instrumentation and control technologies in nuclear power plants. In 2007-2008, the U.S. Nuclear Regulatory Commission issued Interim Staff Guidance on technical issues that include diversity and defense-in-depth, digital communication, cyber security, risk-informed regulation, and human factors for highly integrated control rooms. The experience gained through recent licensing activity for digital safety-related systems provides insight into the degree to which these issues are resolved and can help to identify other emerging issues. The session will include panelists representing regulators, system suppliers, and licensees.

#### PANELISTS:

- Scott Patterson (*PG&E*)
- Christopher Wiegand (*Exelon*)
- William Kemper (*NRC*)

**Computational Thermal Hydraulics—II**, sponsored by THD. *Chair:* Baris Sarikaya (*GEH*)

### Dunwoody

**1:00 p.m.**

Predictions of Phase Distribution in Liquid-liquid Two-component Flow Using FLUENT-IATE, Xia Wang, Xiaodong Sun (*Ohio State*), Walter Duval (*NASA Glenn Research Center*)

**1:25 p.m.**

Design and Analysis of Supercritical Carbon Dioxide Gas Turbine, Tae W. Kim, Wi S. Jeong, Kune Y. Suh (*Seoul Natl Univ*)

**1:50 p.m.**

FLUENT Modeling for Flow Reversal in Downward Mixed Convection Conditions, Brian Jackson, Jose Reyes, Brian Woods (*Oregon State Univ*)

**2:15 p.m.**

Numerical Modeling of Buoyant Turbulent Mixing at High Density Ratio, Ivan Otic (*FzK—Germany, Inst for Nuclear and Energy Technologies*)

**2:40 p.m.**

CFD Simulation of Thermal-Hydraulic Characteristics in PBR Core, C. Y. Wu, Y. M. Ferng, B. S. Pei, C. C. Chieng (*Natl Tsing Hua Univ—Taiwan*)

**3:05 p.m.**

Thermal Analysis of the Dry Storage Cask System for Chinshan Nuclear Power Plant, Hsiang-Cheng Hu, Jong-Rong Wang, Yung-Shin Tseng (*Inst of Nuclear Energy Research*)

**Nuclear Research Reactors: Utilizations and Applications of Nuclear Methods**, sponsored by IRD; cosponsored by BMD. *Session Organizer:* Kenan Ünlü (*Penn State Univ*). *Chair:* Kenan Ünlü

### Fairlie

**1:00 p.m.**

Reproducible Elemental Analyses of Single-Walled Carbon Nanotubes by Neutron Activation Analysis, R. Zeisler, R. L. Paul, R. O. Spatz (*NIST*), invited

**1:25 p.m.**

Modeling of Compton Scattering in Remote-Handled Waste Drum for Advanced Detector Program, Jordan McKillop, Bojan Petrovic (*Georgia Tech*)

**1:50 p.m.**

Requirements for a Commercial-Scale Domestic Mo-99 Supply, Richard Coats, Edward Parma, Milton Vernon (*SNL*)

**2:15 p.m.**

A Small, Passively Safe Mo-99 Isotope Production Reactor to Meet the U.S. Demand, Richard Coats, Edward Parma, Milton Vernon (*SNL*)

**2:40 p.m.**

Tracking Source Movements Using Distributed Detectors, R. Klann, R. Vilim, S. de la Barrera (*ANL*)

**Computational Resources for Radiation Modeling**, sponsored by RPSD. *Session Organizer:* Charlotta Sanders (*UNLV*). *Chair:* Eric Burgett (*Georgia Tech*)

### Greenbriar

**1:00 p.m.**

Review: The Monte Carlo Method for Radiation Protection and Shielding, John S. Hendricks (LANL)

**1:30 p.m.**

Embedded Source Distributions in MCNPX, John S. Hendricks (LANL)

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**Progress in Regulation of Safety Culture**, sponsored by NISD. *Session Organizer:* Charles R. Martin (DNFSB). *Chair:* Steve Schultz (Duke Energy)

**Inman**

**1:00 p.m.**

Measuring Safety Culture, Peter S. Winokur, Douglas M. Minnema (DNFSB)

**1:25 p.m.**

Development of a Policy Statement on Safety Culture, June Cai (NRC)

**1:50 p.m.**

Integrated Safety Management System Safety Culture Improvement Initiative, John A. McDonald, Jr. (Washington River Protection Solutions, LLC)

**2:15 p.m.**

Cultivation of Safety Culture Within the Department of Energy, Richard S. Hartley (B&W Pantex)

**2:40 p.m.**

Assessing the Free Flow of Information in Support of Organizational Safety Culture, Eric V. Fries (Equinox Consulting LLC)

**3:05 p.m.**

Leading Indicators and the Significance Determination Process, Charles R. Martin (DNFSB)

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**Mathematical Modeling and Computational Methods**, sponsored by MCD. *Session Organizer:* Todd Urbatsch (LANL). *Chair:* Kevin Clarno (ORNL)

**Kennesaw**

**1:00 p.m.**

Simulation Model of Mobile Detection Systems, Thomas Edmunds, Daniel Faissol, Yiming Yao (LLNL)

**1:25 p.m.**

Combining Random and Systematic Errors for Experimental Model Validation, Dan-Gabriel Cacuci (Univ of Karlsruhe), Mihaela Ionescu-Bujor (FzK-Germany)

**1:50 p.m.**

Impact of the Stochastic Distribution of Fuel Particles on VHTR Neutronic Analysis, Wei Ji (RPI)

**2:15 p.m.**

Monte Carlo Simulation of Oil Well Logging Tools Using Spherical Coordinate Meshes for Weight Window Importances, Robin P. Gardner, Cody R. Peebles (NCSU)

**2:40 p.m.**

Stochastic Finite-Element Approach in Nuclear Reactor Uncertainty Quantification, Oleg Roderick (Argonne/Portland State Univ), Mihai Anitescu, Paul Fischer, Won-Sik Yang (ANL)

**3:05 p.m.**

GPU-Based Parallel Computing: A New Computational Approach and its Applications to Nuclear Engineering, Kai Huang, Volodymyr Kindratenko, Rizwan-uddin (Univ of Illinois)

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**Data, Analysis, and Operations for Nuclear Criticality Safety—II**, sponsored by NCSU; cosponsored by YMG. *Session Organizer:* Nichole Ellis (Ellis Nuclear Eng). *Chair:* Kermit Bundle (DOE)

**Piedmont**

**1:00 p.m.**

Use of List-Mode Data Acquisition Systems for Performing Benchmark Subcritical Neutron Measurements, William L. Myers, Gaetano J. Arnone, Sheila G. Melton (LANL)

**1:25 p.m.**

Analysis of a Reflected Alpha-Phase Plutonium Sphere, J. Hutchinson, W. Myers, R. Sanchez (LANL)

**1:50 p.m.**

Achieving Criticality Safety Defense-in-Depth Using Reliability Analysis with Augmented Correlation Analysis, Burton Rothleder (DOE)

**2:15 p.m.**

Methodology for Validating Minor Actinide Fission Cross Sections, C. van der Hoeven, E. Schneider (Univ of Texas, Austin)

**2:40 p.m.**

Investigation of Absorber Materials in Water-Reflected Systems, J. Hutchinson, R. Paternoster (LANL)

**3:05 p.m.**

Single Parameter Control: Does It Impact Safety?, J. J. Lichtenwalter (Y-12 NSC), Jeff Castor (Bechtel Jacobs), Clinton Gross (Paschal Solutions)

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**Modular Construction for Nuclear New Build Projects—Panel**, sponsored by OPD. *Session Organizer:* Keyes Niemer (Shaw Power Group). *Chair:* Keyes Niemer

**Spring**

**1:00 p.m.**

Modular construction is being employed for many of the new nuclear plant projects in the U.S. and abroad. The purpose of this panel discussion is to provide an update/status on modular construction efforts for current new build projects as well as discuss challenges. The panel session will draw together new plant constructors, module fabricators, and regulators from around the world to discuss their current approaches.

PANELISTS:

- Bill Carnes (Westinghouse)
- Dan Magnarelli (AREVA)
- Frank Gillespie (Mitsubishi Energy Systems)
- Alan Blamey (NRC)

## TECHNICAL SESSIONS BY DAY: TUESDAY/WEDNESDAY

**The Waste Isolation Pilot Plant: 10 Years of Operations**, sponsored by FCWMD. *Session Organizers:* Jean-Francois Lucchini, Sheila Lott (LANL). *Chair:* David C. Moody (DOE)

### Techwood

#### 1:00 p.m.

National Transuranic Waste Program—the First Ten Years of Disposal Operations, David C. Moody (DOE), Sheila A. Lott (LANL)

#### 1:25 p.m.

Scientific Achievements in Radiological and Nuclear Engineering at the WIPP Site, Robert B. Hayes (Washington TRU Solutions LLC)

#### 1:50 p.m.

Evolution of Performance Assessment in Support of WIPP Operations, Joseph Kanney, Daniel Clayton, Eric Vugrin, Sean Dunagan, Clifford Hansen (SNL)

#### 2:15 p.m.

Overview of the Actinide Chemistry in the WIPP, M. Borkowski, J. F. Lucchini, M. K. Richmann, H. Khaing, J. Swanson, D. T. Reed (LANL)

#### 2:40 p.m.

Significant Developments in the Understanding of Culebra Hydrology at the WIPP Site, Michael B. Hillesheim, Kristopher L. Kuhlman, Richard L. Beauheim (SNL)

#### 3:05 p.m.

Ten Operating Years at the Waste Isolation Pilot Plant, Candice C. Jierree (Washington TRU Solutions LLC)

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**Innovations in Nuclear Engineering Education**, sponsored by ETD. *Session Organizer:* Peter Caracappa (RPI). *Chair:* Peter Caracappa

### Hanover A

#### 1:00 p.m.

Nuclear Power Technology AAS Degree for Entry-Level Nuclear Technicians, Steve Sieben (Wharton County Junior College)

#### 1:25 p.m.

Development of a Problem-Based Undergraduate Nuclear Course to Strengthen Math Skills in Support of the US Nuclear Workforce, Randy Etter (Univ of Missouri Research Reactor), William H. Miller, Gayla M. Neumeyer (Univ of Missouri, Columbia), Bruce A. Meffert, Theresa J. Yeager, Victoria A. Schwinke (Linn State Technical College), Lori Kilfoil (Missouri Univ Research Reactor), Krista Galyen (Univ of Missouri, Columbia)

#### 1:50 p.m.

Development of Educational Undergraduate Course Modules for Interactive Reactor Physics, Nader Satvat, John Perry, Yang Xue, Shanjie Xiao, Tatjana Jevremovic (Purdue Univ)

#### 2:15 p.m.

An Overview of ABET Harmonized Accreditation Criteria, Michael A. Robinson (Bechtel Marine Propulsion Corp)

### WEDNESDAY • JUNE 17, 2009

7:30 AM – 5:00 PM

#### MEETING REGISTRATION

8:00 AM – 10:00 AM

#### SPOUSE/GUEST HOSPITALITY

8:30 AM – 11:30 AM

#### 2009 ANS ANNUAL MEETING: TECHNICAL SESSIONS

- Reactor Physics Design, Validation, and Operating Experience
- Highlights of NPIC&HMIT 2009
- General Two-Phase Flow
- Nuclear-Based Imaging for Medical Diagnosis and Therapy—I
- Monte Carlo Dice Seminar
- Probabilistic Applications in Nuclear Installations Safety
- Status Report on Readiness for and Implementation of New Construction Inspection—Panel
- Ensuring the Long-Term Safe and Sustainable Nuclear Energy Option—Panel
- Groundwater Protection—Panel
- Advanced Fuels and Recycle
- Issues in Public Education and Communication
- New Nuclear Engineering Programs at Colleges and Universities—Panel

8:30 AM – 11:30 AM

#### NETS-2009 EMBEDDED TOPICAL MEETING: TECHNICAL SESSIONS (see page 32)

1:00 PM – 4:00 PM

#### 2009 ANS ANNUAL MEETING: TECHNICAL SESSIONS

- Advances in Small- and Medium-Size Reactor Design—III
- Environmental Sciences: Sustainable Development
- Rod Bundle Thermal Hydraulics
- Nuclear-Based Imaging for Medical Diagnosis and Therapy—II
- NJOY—Tutorial
- Emerging Issues in Reactor Safety—I
- Severe Accidents and Fluid-Structure Interaction
- Nuclear Criticality Safety Staff and Operations Interface
- Army Corps/FUSRAP: Decommissioning and Decontamination of Nonreactor Sites—Panel
- Export Control Compliance in Emerging Nuclear Markets—Panel
- Focus on Communications: The Nuclear Story and Other Tales—Panel
- Focus on Communications in the New Media—Panel

1:00 PM – 4:00 PM

#### NETS-2009 EMBEDDED TOPICAL MEETING: TECHNICAL SESSIONS (see page 32)

4:00 PM – 6:00 PM

#### ANS PUBLIC COMMUNICATIONS WORKSHOP

6:00 PM – 10:30 PM

#### EVENING EVENT:

“Dinner at the Fox Theatre/Jersey Boys”

### WEDNESDAY, JUNE 17, 2009 • 8:30 A.M.

**Reactor Physics Design, Validation, and Operating Experience**, sponsored by RPD. *Session Organizer:* Fausto Franceschini (Westinghouse). *Chair:* Juan Luis Francois (Univ Nacional Autonoma de México)

### Baker

#### 8:30 a.m.

Power Distribution Analysis for the High Flux Isotope Reactor Critical Experiment 3, David Chandler (Univ of Tennessee), R. T. Primm, III (ORNL), G. Ivan Maldonado (Univ of Tennessee)

#### 8:55 a.m.

Performance of ENDF/B-VII.0 for Rod Worth and Sodium-Void Worth Analyses for a Large LMFBR, R. M. Lell, R. D. McKnight (ANL)

#### 9:20 a.m.

Interpretation of Incore Flux Measurements in Cores Containing MOX Fuel, J. L. Eller (Duke Energy)

#### 9:45 a.m.

MCWO-Calculated VVER Annular Fuel Radial Burnup Profile Validation, G. S. Chang, M. A. Lillo (INL), H. Sagara (Research Laboratory for Nuclear Reactor)

**10:10 a.m.**

BWR MOX Fuel Design with Plutonium and Minor Actinides, J. L. François, J. R. Guzmán (*Univ Nacional Autonoma de México*)

**10:35 a.m.**

Feasibility Study on Reduced Boron Concentration Operation for PWR, Aung Tharn Daing, Myung-Hyun Kim (*Kyung Hee Univ-Korea*)

**Highlights of NPIC&HMIT 2009**, sponsored by HFICD. *Session Organizer:* Richard Wood (*ORNL*). *Chair:* David Holcomb (*ORNL*). All invited.

**Courtland**

**8:30 a.m.**

Addressing Digital Control Room Human Factors Technical and Regulatory Issues, Joseph A. Naser (*EPRI*)

**8:55 a.m.**

Use of Design Acceptance Criteria for Instrumentation and Control Systems, Terry W. Jackson, Thomas Fredette, Kimberley Corp, Joseph Ashcraft (*NRC*)

**9:20 a.m.**

Dynamic Reliability Modeling of Digital Instrumentation and Control Systems in Nuclear Power Plants, T. Aldemir (*Ohio State*), S. Guarro (*ASCA, Inc.*), J. Kirschenbaum, D. Mandelli, L. A. Mangan, P. Bucci (*Ohio State*), M. Yau (*ASCA, Inc.*), B. Johnson, C. Elks (*Univ of Virginia*), E. Ekici, M. P. Stovsky, D. W. Miller, X. Sun (*Ohio State*), S. A. Arndt (*NRC*)

**9:45 a.m.**

Wireless Technologies for Nuclear Facilities, H. M. Hashemian, C. J. Kiger, J. C. Seibel, B. D. Shumaker (*AMS Corp*), Madeline Anne Feltus (*DOE*)

**10:10 a.m.**

Fusing Data Sources for Optimal Prognostic Parameter Selection, Jamie Coble, J. Wesley Hines (*Univ of Tennessee*)

**10:35 a.m.**

Optimal Sensor Placement Strategy for the Steam Generator System in an Integral Pressurized Water Reactor, Fan Li, Belle R. Upadhyaya, J. Wesley Hines (*Univ of Tennessee*)

**11:00 a.m.**

Damage Assessment Technologies for Prognostics and Proactive Management of Materials Degradation (PMMD), L. J. Bond, S. R. Doctor, J. W. Griffin (*PNNL*), A. B. Hull, S. N. Malik (*NRC*)

**General Two-Phase Flow**, sponsored by THD. *Chair:* Xiaodong Sun (*Ohio State*)

**Dunwoody**

**8:30 a.m.**

The Well-Posedness of Incompressible One-Dimensional Two-Fluid Model with the Inclusion of the Interfacial Area Transport Equations, Xia Wang, Xiaodong Sun (*Ohio State*)

**8:55 a.m.**

Experimental Study of Thin Plate Cooling Using Industrial Two-Phase Nozzles, S. Cadell, J. Luitjens, Q. Wu (*Oregon State Univ*)

**9:20 a.m.**

Objective Classification of Two-Phase Flow Regimes Via Ultrasonic Signals, Justin D. Talley, Subhadeep Chakraborty, Eric Keller, Asok Ray, Seungjin Kim (*Penn State*)

**9:45 a.m.**

Characterization of a Combinatorial Round Pipe Flow, Vivek Raja Raj Mohan, Mohan Yadav, Justin D. Talley, Mark G. Dorn, Seungjin Kim (*Penn State*)

**10:10 a.m.**

Implementation of One-Group Interfacial Area Transport Equation into TRACE, Justin D. Talley, James Spring, Seungjin Kim, John Mahaffy (*Penn State*)

**10:35 a.m.**

An Approach to Couple a Homogeneous Equilibrium Model and a Two-Phase Two-Fluid Model, Suneet Singh, Vincent A. Mousseau (*INL*)

**Nuclear-Based Imaging for Medical Diagnosis and Therapy—I**, sponsored by BMD; cosponsored by IRD. *Session Organizers:* Nicholas Spyrou (*Univ of Surrey*), Bruce D. Smith (*Univ of Texas*). *Chair:* Nicholas Spyrou

**Fairlie**

**8:30 a.m.**

PET/CT Scanners—Recent Developments and Scanner Performance, Bjoern W. Jakoby [*Univ. of Surrey (UK), Univ. of Tennessee Medical Center, Siemens MI*], David W. Townsend (*Univ of Tennessee Medical Center*), Nicholas M. Spyrou (*Univ of Surrey*), invited

**8:55 a.m.**

PET/CT Motion Correction in Minimising Gross Tumour Volume in NSCLC, A. Masoomi, A. H. Dawson (*Portsmouth Hospitals - NHS*), Y. Bouchareb (*Royal Marsden Hospital and Inst of Cancer Research*), invited

**9:20 a.m.**

Operation of a Commercial Site Producing PET Radiopharmaceuticals in the UK and Ireland, Loretta L. Admans (*Erigal Limited*), Ruairi O'Donnell (*M2i Limited*), invited

**9:45 a.m.**

Comparison of Radiation Exposure to Staff in Mobile and Static PET/CT Units, N. M. Spyrou, K. Alsafi, M. Alkhorayef (*Univ of Surrey*), invited

**10:10 a.m.**

In-Water Dose Measurements for a New-Generation <sup>252</sup>Cf Brachytherapy Source, C-K Chris Wang, Robert S. Kelm (*Georgia Inst of Technol*)

**Monte Carlo Dice Seminar**, sponsored by RPSD. *Session Organizer:* John Hendricks (*LANL*). *Chair:* John Hendricks

**Greenbriar**

**8:30 a.m.**

For years John Hendricks, LANL, also known as “The Dice Man,” has been giving seminars on the Monte Carlo method for radiation modeling using dice. This session presents the Monte Carlo method in a novel way for anyone wishing to learn more about the method and how it works. It also demonstrates an effective education and training technique suitable for nonspecialists.

## TECHNICAL SESSIONS BY DAY: WEDNESDAY

After an entertaining walk through the history and applications of Monte Carlo for radiation transport, dice are used to solve for the value of  $\pi$ , to determine the criticality of a reactor, and then to “fry the guy on the other side of the wall” with a radiation shielding problem. Important concepts from random numbers to variance reduction to statistical laws are picked up along the way.

**Probabilistic Applications in Nuclear Installations Safety**, sponsored by NISD. *Session Organizer:* Stephen Schultz (*Duke Energy*). *Chair:* Kevin R. O’Kula (*Washington Safety Management Solutions*)

### Inman

#### 8:30 a.m.

Comparison of Three Methods for Reliability Quantification, Douglas A. Fynan, John C. Lee (*Univ of Michigan*)

#### 8:55 a.m.

Assessment of Cable Integrity and CCDP Evaluation When Using Fire Models in the Fire PSA, Yoon-Hwan Lee, Woo-Sik Jung, Joon-Eon Yang (*KAERI*), Jong-Hoon Kim (*Kwangwoon Univ*)

#### 9:20 a.m.

An Integrated Prediction of the Likelihood of Spurious Actuation of AC Circuits Due to Fires, Raymond H. V. Gallucci, Naem Iqbal (*NRC*)

#### 9:45 a.m.

Vital Area Identification Method Development Using External Event PSAs, Woo Sik Jung, Yoon-Hwan Lee (*KAERI*)

#### 10:10 a.m.

Application of Limit Curves to the Risk-Informed Regulation of Sodium Fast Reactors, Acacia Brunett, Richard Denning, Tunc Aldemir (*Ohio State*)

#### 10:35 a.m.

Linking of the RELAP5-3D Thermal-Hydraulic Code with the ADAPT PRA Tool, Kyle Metzroth, Ryan Winningham, Umit Catalyurek, Richard Denning, Tunc Aldemir (*Ohio State*)

**Status Report on Readiness for and Implementation of New Construction Inspection–Panel**, sponsored by OPD. *Session Organizer:* N. Prasad Kadambi (*Consultant*). *Chair:* N. Prasad Kadambi

### Kennesaw

#### 8:30 a.m.

This session will bring together speakers from the U.S. Nuclear Regulatory Commission (NRC) and industry to examine challenges and solutions. Specific topics may include regulatory infrastructure for new construction inspection, industry effort to bring new manufacturing into the U.S., and needed support to update Codes and Standards. Attendees will gain perspective in an overview fashion on each of the topics addressed.

#### PANELISTS:

- Loren Plisco (*NRC*)
- Allen Torres (*South Carolina Electricity and Gas Co*)
- Glenn Tracy (*NRC*)
- Tom Ray (*Westinghouse*)
- Russ Bell (*NEI*)
- Charles Pierce (*Southern Company*)

**Ensuring the Long-Term Safe and Sustainable Nuclear Energy Option–Panel**, sponsored by OPD. *Session Organizer:* C. E. Carpenter (*NRC*). *Cochairs:* C. E. Carpenter, Richard Reister (*DOE*)

### Piedmont

#### 8:30 a.m.

To facilitate a long-term safe and sustainable nuclear energy option, the U.S. Department of Energy (DOE), U.S. Nuclear Regulatory Commission (NRC), and Electric Power Research Institute (EPRI) have initiated complementary research programs. DOE’s “Light Water Reactor (LWR) Sustainability Program” will focus on longer-term and higher-risk/reward research contributing to national objectives of energy stability and environmental security. NRC’s “Life Beyond 60” aging management research program supports regulatory decision-making. EPRI’s “Long Term Operability Program” addresses shorter-term industry research needs. Each of these programs was created as a common approach to addressing the aging nuclear fleet. The session will discuss each of these programs.

#### PANELISTS:

- Sama Bilbao y Leon (*IAEA*)
- C. E. (Gene) Carpenter (*NRC*)
- John Gaertner (*EPRI*)
- Sudesh Gambhir (*Energy Northwest*)
- Il Soon Hwang (*Seoul National Univ*)
- Tom Miller (*DOE*)

**Groundwater Protection–Panel**, sponsored by DDRD; cosponsored by ESD. *Session Organizer:* Nadia Glucksberg (*MACTEC*). *Chair:* Nadia Glucksberg

### Spring

#### 8:30 a.m.

The groundwater protection initiatives that are currently being completed highlight the potential for tritium (as well as other contaminants) to enter into the aquifers below active facilities. This not only impacts water quality, but the extent of impacted groundwater could trigger groundwater remediation and/or could impact decommissioning costs. This panel will discuss case studies, the development of conceptual site models, and how this initiative has impacted individual plants.

#### PANELISTS:

- Barry E. Muller (*DTE Energy*)
- Mary Beth Lloyd (*SNOP*)
- Gordon Williams (*STP Nuclear Operating Co*)
- Donald Hintz (*Dominion Generation*)
- Richard M. Fil (*Robinson & Cole LLP*)

**Advanced Fuels and Recycle**, sponsored by FCWMD (in collaboration with SCNN). *Session Organizer:* Bill Del Cul (*ORNL*). *Chair:* Barry Spencer (*ORNL*)

### Techwood

#### 8:30 a.m.

Preparation of Zirconia Spheres for Sphere-Pac Transmutation Targets, J. D. Davis, C. R. Thomas, R. L. Glass (*Nuclear Fuel Services, Inc.*)



**8:55 a.m.**

Preparation of Zirconia for Transmutation Targets Using Modified Direct Denitration, J. D. Davis, C. R. Thomas, P. H. Roberts (*Nuclear Fuel Services, Inc.*)

**9:20 a.m.**

Sustaining Nuclear Power's Impact on Carbon Emissions by Recycle, James L. Buel, Wayne L. Johnson (*PNNL*)

**9:45 a.m.**

Analysis of Advanced Fuel Assemblies for the LWRs, A. Bingham, B. Bradley, Y. Zhang, J. Ragusa, S. Chirayath, K. Vierow (*Texas A&M*)

**10:10 a.m.**

Use of Gas-Cooled Fast Reactors for Recycling Spent Fuels, Hangbok Choi, Alan Baxter (*General Atomics*)

**10:35 a.m.**

GNEP Hydrided Metal-Alloy Fuel Based Recycling Reactor, Gregory A. Johnson (*Hamilton Sundstrand*)

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**Issues in Public Education and Communication**, sponsored by ETD. *Session Organizer:* Peter F. Caracappa (*RPI*). *Chair:* Dave Pointer (*ANL*)

**Hanover A**

**8:30 a.m.**

Compilation of Research Concerning Public Perception of the Nuclear Industry, Amy Varallo, Timothy Cahill, Tris Utschig, Samuel LaFountain, Min-Hee Sayer, Aaron Clare, Karen Scarbrough, William Day, Colin Bowers, Anthony Minarik, Sarah Anglin, Alexander Moore, Joshua Andrews, Meg Schroeder, Nivedh Manohar (*Georgia Tech*)

**8:55 a.m.**

Radiation: How to Address the Confusion, Jill Anderson (*Univ of Illinois*)

**9:20 a.m.**

The POWER SET Program: Attracting Young Women into STEM Careers, Lindsey Davis Stover, Valerie G. Segovia (*Texas A&M*)

**9:45 a.m.**

Nuclear Education with New Media: Developing a Multimedia Guide to Nuclear Energy, Michelle M. Smith, Charles D. Ferguson (*Council on Foreign Relations*)

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**New Nuclear Engineering Programs at Colleges and Universities—Panel**, sponsored by ETD. *Session Organizers:* H. L. Dodds (*Univ of Tennessee*), John Gutteridge (*NRC*). *Chair:* H. L. Dodds

**Regency V**

**8:30 a.m.**

The purpose of this session is to provide a venue for new and emerging nuclear engineering programs at colleges and universities to describe and discuss the hurdles that must be overcome in establishing and growing new programs. Exchange of information on what the hurdles are and how to overcome them will be beneficial to all new and emerging programs as well as to some established programs.

**PANELISTS:**

- Erno Sajo (*Louisiana State Univ*)
- George Imel (*Idaho State Univ*)
- Travis W. Knight (*Univ of South Carolina*)
- Russell D. Jamison (*Virginia Commonwealth Univ*)
- Mark Pierson (*Virginia Polytechnic Inst and State Univ*)
- Uwe Greife (*CSM*)
- Joel Rauber (*South Dakota State Univ*)
- Pradosh Ray (*Tuskegee Inst*)
- Robert McTaggart (*South Dakota SMT*)
- Glenn Harvel (*Univ of Ontario Inst of Technol*)

**WEDNESDAY, JUNE 17, 2009 • 1:00 P.M.**

**Advances in Small- and Medium-Size Reactor Design—III**, sponsored by RPD. *Session Organizer:* Youssef Shatilla (*MASDAR Inst of Science and Technology*). *Chair:* Youssef Shatilla

**Baker**

**1:00 p.m.**

Reflector Design Issues for Innovative Small Light Water Reactors, Alexey Soldatov, Todd S. Palmer (*Oregon State Univ*)

**1:25 p.m.**

Basis for Green Energy Multiplier\* Alternative Nuclear Technology (GEM\*ART), C. D. Bowman (*ADNA Corp.*), R. B. Vogelaar (*Virginia Tech*), E. G. Bilpuch (*Duke Univ*), D. C. Bowman (*ADNA Corp.*), C. R. Howell (*Duke Univ*), M. A. Pierson (*Virginia Tech*), A. P. Tonchev, W. Tornow (*Duke Univ*)

**1:50 p.m.**

Impact and Operation of GEM\* ART, M. A. Pierson (*Virginia Tech*), C. D. Bowman (*ADNA Corp.*), R. B. Vogelaar (*Virginia Tech*), D. C. Bowman (*ADNA Corp.*)

**2:15 p.m.**

Research on Physics Characteristics of Thorium-Based Long-Life Reactor System, Ganglin Yu, Kan Wang (*Tsinghua Univ—China*)

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**Environmental Sciences: Sustainable Development**, sponsored by ESD. *Chair:* C. E. Carpenter (*NRC*)

**Courtland**

**1:00 p.m.**

Nuclear Power: Protect the Environment and Well-Being of People, H. Douglas Lightfoot (*McGill Univ*)

**1:25 p.m.**

Use of Ice Thermal Storage Systems to Address LWR Cooling Issues, Haihua Zhao, Hongbin Zhang, Ronaldo Szilard (*INL*), Wei Yan (*Texas A&M*)

**1:50 p.m.**

Enabling Underground Nuclear Parks by Sharing New Transmission Capacity, C. W. Myers, N. Z. Elkins (*LANL*)

## TECHNICAL SESSIONS BY DAY: WEDNESDAY

### 2:15 p.m.

Risks of Transporting TRU Waste to the Waste Isolation Pilot Plant, Ruth F. Weiner (*SNL*)

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**Rod Bundle Thermal Hydraulics**, sponsored by THD. *Cochairs:* Seunjin Kim (*Penn State Univ*), Hisashi Ninokata (*Tokyo Inst of Technol*)

### Dunwoody

#### 1:00 p.m.

Large-eddy Simulation of Turbulent Flow with Heat Transfer in a Rod Bundle, Constantine P. Tzanos (*ANL*), Maxim Popov (*Sarov Laboratories*), Fred Mendonça (*CD-adapco*)

#### 1:25 p.m.

Feasibility Study of the Application of Exotic Pin for Tight-Lattice Fuel Assembly, A. Khakim, E. Merzari, H. Ninokata (*Tokyo Inst of Technol*)

#### 1:50 p.m.

Numerical Investigation of Flow Pulsation Phenomena Using DES-SST Approach, D. Home, M. F. Lightstone, M. S. Hamed (*McMaster Univ*)

#### 2:15 p.m.

An Assessment Study of the POLCA-T Code Based on NUPEC Data, Augusto Hernández-Solís, Paolo Vinai (*Chalmers Univ of Technol*), Ulf Bredolt (*Westinghouse Electric Sweden AB*)

#### 2:40 p.m.

CFD Investigating the Localized Thermal-Hydraulic Characteristics Within Rod Bundles Using Different Turbulence Model, C. C. Liu, Y. M. Ferng, C. K. Shih, B. S. Pei (*Natl Tsing Hua Univ*)

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### Nuclear-Based Imaging for Medical Diagnosis and Therapy—II

sponsored by BMD; cosponsored by IRD. *Session Organizers:* Nicholas Spyrou (*Univ of Surrey*), Bruce D. Smith (*Univ of Texas*). *Chair:* Nicholas Spyrou

#### Fairlie

##### 1:00 p.m.

Preliminary Analysis of Compton Camera Imaging Systems for Radiotherapy Dose Reconstruction, Daniel W. Mundy, Michael G. Herman (*Mayo Clinic*)

##### 1:25 p.m.

A Comparison of Compton Camera Data Sets, Bruce Smith, L. Joseph Denbina (*Univ of Texas at San Antonio*)

##### 1:50 p.m.

Quantification of MRI Images Using Second Level KT-1 Signature, Sunita Yadav, M. S. Kalra, Prabhat Munshi (*IIT Kanpur*), S. Khushu (*INMAS New Delhi*)

##### 2:15 p.m.

Definition by Radiation Properties: A Proposal for Next-Generation Anthropomorphic Phantoms, M. P. W. Chin, N. M. Spyrou (*Univ of Surrey*), invited

##### 2:40 p.m.

Modeling of Radioxenon Production and Release Resulting from Medical Isotope Production, S. R. Biegalski (*Univ of Texas, Austin*)

**NJOY—Tutorial**, sponsored by RPSD. *Session Organizer:* John Hendricks (*LANL*). *Chair:* Albert C. Kahler (*LANL*)

### Greenbriar

#### 1:00 p.m.

This half-day tutorial will provide a brief description and demonstration of installing and using the NJOY Nuclear Data Processing System. NJOY can be and has been used in a variety of computing environments, from large mainframe systems to laptops. This lecture will be driven from a Windows laptop PC using the freely available G95 fortran compiler.

Sample problems that create continuous energy (ACE) files necessary for use with the Los Alamos National Laboratory (LANL) MCNP/MCNPX codes will be run and the output examined. Jobs using the newly installed ERRORJ covariance module will also be run and their outputs reviewed. A limited number of LANL laptop computers will be available for use. Participants who have already obtained the NJOY99 computer program package from the Radiation Safety Information Computational Center (RSICC) or the Nuclear Energy Agency (NEA) are encouraged to bring their own laptops. Discussion by users of ongoing and anticipated future needs is encouraged. No previous experience with the NJOY code system or the Evaluated Nuclear Data File is assumed.

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### Emerging Issues in Reactor Safety—I

sponsored by NISD. *Session Organizer:* Stephen Schultz (*Duke Energy*). *Chair:* Raymond H. V. Gallucci (*NRC*)

#### Inman

##### 1:00 p.m.

Downstream Core Blockage in PWR Loss of Coolant Accidents, Matthew Bucknor, Richard Denning (*Ohio State*)

##### 1:30 p.m.

Effect of the Flow Model on the Containment Pressure After a Feedwater Line Break, Juan J. Carbajo (*ORNL*)

##### 2:00 p.m.

Heavy Liquid Metal Reactor Experimental Facility Risk Assessment, Luciano Burgazzi (*ENEA*)

##### 2:30 p.m.

TRACE Modeling of Chinshan Load Rejection Startup Test, Jing-Han Lee (*Natl Tsing Hua Univ*), Jong-Rong Wang, Hao-Tzu Lin (*Inst of Nuclear Energy Research Atomic Energy Council*), Su-Ming Yang, Chunkuan Shih (*Natl Tsing Hua Univ*)

##### 3:00 p.m.

Passive Heat Removal System Recovery Following an Aircraft Crash Using Dynamic Event Tree Analysis, Ryan D. Winningham, Kyle Metzroth, Tunc Aldemir, Richard Denning (*Ohio State*)

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### Severe Accidents and Fluid-Structure Interaction

sponsored by THD. *Chair:* Sama Bilbao y Leon (*IAEA*)

#### Kennesaw

##### 1:00 p.m.

A Study on Estimating the RCS Creep-Rupture Failure Probability in Station Blackout Severe Accident, Young Suk Bang, Byung Chul Lee (*FNC Technology Co., Ltd*), Kwang Il Ahn, Yong Mann Song (*KAERI*)

**1:25 p.m.**

Triggering of Melt-Water Steam Explosions over Porous and Non-Porous Surfaces, R. P. Taleyarkhan (*Purdue Univ*), S. H. Kim (*ORNL*)

**1:50 p.m.**

Validation of MELCOR 2.1 Code Against OECD THAI HM-2 Experiment, Jiri Duspiva (*Nuclear Research Inst Rez plc.*)

**2:15 p.m.**

Design of an Accident Identification and Prediction System to Support Severe Accident Management Activities at NPP, Ko Ryu Kim, Yong Mann Song, Soo Yong Park, Kwang-Il Ahn (*KAERI*)

**2:40 p.m.**

Verification and Validation of Severe Accident Management Guidelines for Kori#1 Nuclear Power Plant, Young Seung Lee, Hyeong Taek Kim, Seung Jong Oh (*KHNP*)

**Nuclear Criticality Safety Staff and Operations Interface**, sponsored by NCS&D; cosponsored by YMG. *Session Organizer:* Robert Wilson (*EM*). *Chair:* Robert Wilson

**Piedmont**

**1:00 p.m.**

Development of the Criticality Safety Officer Program at Rocky Flats, Robert E. Wilson (*DOE*)

**1:20 p.m.**

How Criticality Safety Staff Operational Relationships Affect Inspection Focus at NRC Licensed Fuel Cycle Facilities, Dennis C. Morey, Thomas J. Marenchin (*NRC*)

**1:40 p.m.**

K-25/K-27 D&D Project Criticality Safety Officer Program, Roger W. Bartholomay, Thomas J. Rankin (*Washington SMS*), Samy Hanna (*eProject*)

**2:00 p.m.**

Criticality Safety Officer Training at the K-25/K-27 D&D Project, R. W. Carson, Jr. (*NISYS*), Michael J. Crouse (*URS - Washington Division*)

**2:20 p.m.**

Implementation of Criticality Controls in the KIS Facility at SRS, Marc L. Nadeau, Jagdish N. Joshi (*Savannah River Site*)

**2:40 p.m.**

Criticality Safety Officer Functions and Applications, Mark A. Joseph (*B&W Y12*)

**3:00 p.m.**

Nuclear Criticality Safety and Operations Interface at LLNL, John S. Pearson (*LLNL*)

**3:20 p.m.**

The LANL Criticality Safety Officer Program, Douglas G. Bowen (*LANL*)

**Army Corps/FUSRAP: Decommissioning and Decontamination of Nonreactor Sites—Panel**, sponsored by DDRD. *Session Organizer:* Nadia Glucksberg (*MACTEC*). *Chair:* Nelson Walter (*MACTEC*)

**Spring**

**1:00 p.m.**

Substantial progress has been made in the decommissioning of sites that are implemented by the U.S. Army Corps of Engineers (USACE). These include both Formerly Utilized Sites Remedial Action Program (FUSRAP) at U.S. Department of Energy (DOE) facilities and non-FUSRAP sites under Superfund and follow Environmental Protection Agency's (EPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process to reach closure. These projects are often associated with unique technical and regulatory challenges. This panel will discuss ongoing challenges and lessons learned from FUSRAP and commercial nonreactor projects completed under USACE oversight.

PANELISTS:

- David Green (*Robinson & Cole LLP*)
- Kim Nelson (*Cabrera Services*)
- Donell Jackson (*ABB, Inc*)
- Keith Knauerhase (*ABB, Inc*)
- Ellen Iorio (*U.S. Army Corps of Engineers*)
- Hans Honerlah (*USACE*)

**Export Control Compliance in Emerging Nuclear Markets—Panel**, sponsored by FCWMD (in collaboration with SCNN). *Session Organizer:* Linda H. Hansen (*ANL*). *Chair:* Todd E. Perry (*DOE*)

**Techwood**

**1:00 p.m.**

For decades, the United States and the international community have advocated the regulation for the use and supply of materials, equipment, and technology that could contribute to proliferation of weapons of mass destruction (WMDs). A critical component of the international nonproliferation efforts is effective export controls. As global nuclear development expands, it is essential for the U.S. nuclear industry and research and development (R&D) organizations to understand and comply with export control laws and regulations. The DOE/NNSA International Nonproliferation Export Control Program (INECP) coordinates programs to strengthen export control practices worldwide. This session brings together technical experts from government and industry associated with internal compliance programs to discuss the challenges of preventing the spread of nuclear weapons while engaging in global nuclear development with countries such as India. This session offers a unique opportunity for ANS members involved with WMD-related technology to understand U.S. and international export compliance requirements.

PANELISTS:

- Todd Perry (*DOE*)
- Len Phillips (*ORNL*)
- Herb Winegard (*AREVA NP Inc.*)
- Scott Jones (*Univ of Georgia*)
- Richard Faulkner (*ORNL*)
- Rolf Migun (*ORNL*)

**Focus on Communications: The Nuclear Story and Other Tales—Panel**, sponsored by ETD; cosponsored by YMG. *Session Organizer:* David Pointer (*ANL*). *Chair:* Candace Davison (*Penn State Univ*)

**Hanover A**

## TECHNICAL SESSIONS BY DAY: WEDNESDAY/THURSDAY

### 1:00 p.m.

The renewed interest in nuclear energy, and consequently nuclear science and technology in general, has many more of us telling the nuclear story than ever before. But what do we say? And how do we tell our story so that people respond to it positively? In this session we will discuss the key elements of developing compelling messages, including both the research and creative components.

#### PANELISTS:

- Kristi Swartz (*reporter*)
- Laura Scheele (*American Nuclear Society*)

**Focus on Communications in the New Media—Panel**, sponsored by ETD; cosponsored by YMG. *Session Organizers:* Lisa Stiles (*Dominion*), David Pointer (*ANL*). *Chair:* Lisa Stiles

### Hanover A

#### 1:00 p.m.

The nuclear community is at the forefront of energy, medical, and computer technology, but are we at the forefront of communications technology? In this session, we will explore various ways of staying in touch with existing audiences and reaching new potential supporters of nuclear science and technology. What's a widget? What's a tickler? Do I want either?

#### PANELISTS:

- Dan Yurman (*Idaho Samizdat*)
- John Wheeler (*This Week in Nuclear*)
- Rod Adams (*Atomic Insights*)

### THURSDAY • JUNE 18, 2009

7:30 AM – 2:00 PM	<b>MEETING REGISTRATION</b>
8:00 AM – 5:00 PM	<b>PROFESSIONAL DEVELOPMENT WORKSHOP:</b> “Advanced Gas Reactor Technology Course” (The second day of the workshop is on Friday, June 19, 2009.)
8:30 AM – 11:30 AM	<b>2009 ANS ANNUAL MEETING: TECHNICAL SESSIONS</b> <ul style="list-style-type: none"><li>• Reactor Analysis Methods—I</li><li>• Thermal Hydraulics of Advanced Reactors</li><li>• Operations and Power: General</li><li>• MCNP Variance Reduction—Tutorial</li><li>• Emerging Issues in Reactor Safety—II</li><li>• Nonproliferation Technology and Used Fuel Repatriation</li><li>• Nuclear Criticality Safety Standards—Forum</li><li>• Robotics and Remote Systems Research and Deployment</li><li>• Modeling of Nuclear Fuel Cycles</li><li>• Accelerator Applications: General</li></ul>
1:00 PM – 4:00 PM	<b>2009 ANS ANNUAL MEETING: TECHNICAL SESSIONS</b> <ul style="list-style-type: none"><li>• Reactor Analysis Methods—II</li><li>• Recent Progress and Applications of Resonance Calculation Method</li><li>• Thermal Aspects of Nuclear Material Handling and Environmental Monitoring</li><li>• MCNP/X Depletion/Burnup with VESTA—Tutorial</li><li>• Disseminating a Nonproliferation Culture Through Education—Panel</li><li>• Waste and Used Fuel Management</li></ul>

### THURSDAY, JUNE 18, 2009 • 8:30 A.M.

**Reactor Analysis Methods—I**, sponsored by RPD; cosponsored by MCD. *Session Organizer:* Fausto Franceschini (*Westinghouse*). *Chair:* Ivan G. Maldonado (*Univ of Tennessee*)

#### Baker

### 8:30 a.m.

Integration of the NESTLE Core Simulator with SCALE, G. I. Maldonado, J. Galloway, H. Hernandez (*Univ of Tennessee*), K. T. Clarno, E. L. Popov, M. A. Jessee (*ORNL*)

### 8:55 a.m.

Point Kinetics for the Analysis of Pulsed Experiments, Linsen Li (*Tsinghua Univ—China*), Sandra Dulla, Piero Ravetto (*Politecnico di Torino*)

### 9:20 a.m.

Nuclear and Thermal Analysis of Shell-Fuel Pebble Design Based on the Two-Temperature Homogenized Model, Nam Zin Cho, Hui Yu (*KAIST*)

### 9:45 a.m.

Sensitivity Studies of Fuel Pin Temperature for PWR Fuel Assemblies Containing Burnable Absorbers, Davor Grgić, Radomir Ječmenica, Dubravko Pevec (*Univ of Zagreb*)

### 10:10 a.m.

Fission Gas Production in Reactor Fuels, Jianwei Hu, A. C. Hayes (*LANL*), Rizwan-uddin (*Univ of Illinois*)

### 10:35 a.m.

Inexpensive Detailed Full-Core Neutron Flux Solution Method for CANDU Reactors, Eleodor Nichita (*Univ of Ontario Inst of Technol*)

### 11:00 a.m.

Calculation of the Effective Delayed Neutron Fraction with MCNP, Evgeny Y. Stankovskiy (*UNLV*), Christian C. Jammes (*CEA*), Denis E. Beller (*UNLV*)

**Thermal Hydraulics of Advanced Reactors**, sponsored by THD. *Chair:* Karen Vierow (*Texas A&M*)

### Dunwoody

#### 8:30 a.m.

Natural Circulation Phenomena for Passive Safety Systems of Advanced Water Cooled Reactors, Jong Ho Choi, Sama Bilbao y León (*IAEA—Austria*)

#### 8:55 a.m.

Scaling Analysis for VHTR Pebble Bed Test Facility, Ben Nelson, Brian Woods, Brian Jackson (*Oregon State Univ*)

#### 9:20 a.m.

TRACE Analysis of MSIV Closure Direct Scram Event in Lungmen ABWR, Jong-Rong Wang, Hao-Tzu Lin (*Inst of Nuclear Energy Research Atomic Energy Council, R.O.C.*), Wei-Chen Wang, Shu-ming Yang, Chunkuan Shih (*Natl Tsing Hua Univ*)

#### 9:45 a.m.

Steam Generator and Electromagnetic Pump for the 4S Reactor, Ryoma Kato, Hiroyuki Ota, Shigeki Maruyama, Noburu Jimbo, Yasushi Tsuboi, Rie Aizawa (*Toshiba Corp Power Systems Co*), Tony Greci (*Westinghouse*)

**Operations and Power: General**, sponsored by OPD. *Chair:* Art Wharton (*Westinghouse*)

### Fairlie

#### 8:30 a.m.

On-Line Maintenance of Nuclear Plant I&C Systems for Operation Beyond 40 and 60 Years, H. M. Hashemian (*AMS Corp*)

**8:55 a.m.**

Electrical Insulation System Degradation Sensors: “Improving Electrical Component Diagnostic Capabilities,” Ken Watkins (*Polymer Aging Concepts, Inc.*), C. P. Wong (*Georgia Tech*)

**9:20 a.m.**

“United Cycle-6.0”—The Software for Simulation of Static and Slow Dynamic Operation Modes of Thermal and Nuclear Power Plants, Konstantin S. Romanov (*Texas A&M*), Anatoly G. Kutakhov, Sergey N. Romanov (*St. Petersburg State Polytechnical Univ*)

**9:45 a.m.**

Supercritical CO<sub>2</sub> Main Compressor Performance Measurements, Steven A. Wright, Milton E. Vernon, Ross F. Radel (*SNL*), Robert L. Fuller (*Barber Nichols*)

**10:10 a.m.**

Reprocessing of Molten Salt Reactor Fuel, Jan Uhlíř (*Nuclear Research Inst Rez plc*)

**10:35 a.m.**

System Model for a Natural Circulation Integral Test Facility, Mark R. Galvin, Brian G. Woods (*Oregon State Univ*)

**11:00 a.m.**

Under Sodium Viewing Systems for Liquid Metal Fast Reactors, J. W. Griffin, L. J. Bond (*PNNL*), S. H. Sheen, H. T. Chien (*ANL*)

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**MCNP Variance Reduction—Tutorial**, sponsored by RPSD. *Session Organizer:* John Hendricks (*LANL*). *Chair:* Tom Booth (*LANL*)

**Greenbriar**

**8:30 a.m.**

Variance reduction techniques have enabled Monte Carlo radiation modeling calculations to run many of orders of magnitude more efficiently. The fundamentals of variance reduction and some of the available methods will be described by noted experts in the field. A number of laptop computers will be available for participants to try some of the variance reduction techniques available in the MCNP Monte Carlo transport code. Some familiarity with MCNP is assumed.

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**Emerging Issues in Reactor Safety—II**, sponsored by NISD. *Session Organizer:* Stephen Schultz (*Duke Energy*). *Chair:* Lawrence Zull (*DNFSB*)

**Inman**

**8:30 a.m.**

Developing Regulatory Structures in Countries with New Reactor Programs, Richard Barrett, Sergey Katsenelenbogen (*AdSTM*), John Ramsey (*NRC*)

**8:55 a.m.**

Cost Advantages of Large Underground Nuclear Power Parks, Kellen M. Giraud, Jay F. Kunze, James M. Mahar (*Idaho State Univ*), C. Wes Myers (*Consultant*)

**9:20 a.m.**

Integrated Digital Process Management for Nuclear Power Plants, Young K. Park (*PHILOSOPHIA, Inc.*), Kune Y. Suh (*Seoul Natl Univ*)

**9:45 a.m.**

Kinetics Reaction of Silver Catalyzed MnO<sub>2</sub> as Hydrogen Getter for Transportation of Radioactive Materials, David Lambertin, Adrien Blachere, Florence Bart (*CEA*)

**Nonproliferation Technology and Used Fuel Repatriation**, sponsored by FCWMD (in collaboration with SCNN). *Session Organizer:* Michael H. Ehinger (*ORNL*). *Chair:* Michael H. Ehinger

**Kennesaw**

**8:30 a.m.**

Budapest Research Reactor’s Site Preparation for Spent Nuclear Fuel Shipment, S. M. Tozser, I. Vidovszky (*HAS KFKI Atomic Energy Research Inst*), J. N. Dewes (*NNSA Program*)

**8:55 a.m.**

Hungary SNF Shipment Authorization, István Vidovszky (*HAS KFKI Atomic Energy Research Inst*), John Dewes (*NNSA*), Sándor Tózsér (*HAS KFKI Atomic Energy Research Inst*)

**9:20 a.m.**

Safeguards Aspects of the Repatriation of HEU Spent Fuel from Hungary to the Russian Federation, E. Szöllösi, A. Vincze, K. Horváth (*Hungarian Atomic Energy Authority*)

**9:45 a.m.**

Proliferation Reduction Through Disposition by Downblending of Challenging HEU Forms, Michael A. Rush, Ray A. Bond, Norman P. Jacob (*Nuclear Fuel Services, Inc.*)

**10:10 a.m.**

Rapid Mass Spectrometry for Materials Accountability: The TARIS Concept, Benjamin B. Cipiti (*SNL*), Tom J. Whitaker (*Atom Sciences, Inc.*), Jay T. Pride (*Scientific Technology Group*)

**10:35 a.m.**

Real-Time Detection of UREX+3a Extraction Streams for Process Monitoring Applications, Braden Goddard, William S. Charlton, Sean M. McDevitt (*Texas A&M*)

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**Nuclear Criticality Safety Standards—Forum**, sponsored by NCSD. *Session Organizer:* Thomas P. McLaughlin (*Consultant*). *Chair:* Thomas P. McLaughlin

**Piedmont**

**8:30 a.m.**

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**Robotics and Remote Systems Research and Deployment**, sponsored by RRSD. *Session Organizer:* Carl Crane (*Univ of Florida*). *Chair:* Al Sturm (*Par Systems*)

**Spring**

**8:30 a.m.**

Crawler for Inspecting the Z-9 Crib at Hanford, J. C. Tucker, Stan Owsley, Rik Littlefield (*PNNL*)

**8:50 a.m.**

Material Open Test Assembly Specimen Retrieval from Hanford’s Shielded Material Facility, Patrick Valdez, Michael Rinker (*PNNL*)

**9:10 a.m.**

PaR In-Cell Remote Manipulator for Argonne National Laboratory Alpha Gamma Hot-Cell Facility, Gary R. Doebler (*PaR Systems, Inc.*), Donald E. Preuss (*ANL*)

## TECHNICAL SESSIONS BY DAY: THURSDAY

### 9:30 a.m.

3-D Simulation Modeling with ExtendSim 7, Reid Kress (*Y-12 NSC*)

### 9:50 a.m.

Motion Estimation for Improved Target Tracking with a Network of Cameras, W. E. Dixon, C. Crane (*Univ of Florida*), R. Kress, F. Bzorgi (*Y-12, DOE*)

### 10:10 a.m.

Vehicle Automation for Material Transport, Jeff Ferrin, Bret Turpin (*Autonomous Solutions Inc.*), Steven Velat, Brandon Merritt, Carl Crane (*Univ of Florida*)

### 10:30 a.m.

Designs and Performance Assessments of Photon Assisted Radioisotopic Energy Sources, E. V. Steinfelds, J. S. Tulenko (*Univ of Florida*)

### 10:50 a.m.

Machine Vision Secondary Positioning System for a VVER Steam Generator Inspection Manipulator, Fran Jarnjak (*Inetec*)

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**Modeling of Nuclear Fuel Cycles**, sponsored by FCWMD. *Session Organizer:* Bill Del Cul (*ORNL*). *Chair:* Mary Lou Duznik-Gougar (*Idaho State Univ*)

### Techwood

#### 8:30 a.m.

Material Flow Simulation in an International Fuel Supply Model, J<sup>2</sup>Tia Patrice Taylor (*Univ of Illinois/INL*), Rizwan-uddin (*Univ of Illinois*), Jacob Jacobson (*INL*)

#### 8:55 a.m.

Management Tool for Uncertainty Analysis of Advanced Nuclear Fuel Cycles, J. Preston, L. F. Miller (*Univ of Tennessee*)

#### 9:20 a.m.

JAEA Study on Assurance of Supply of Nuclear Fuel, Yosuke Naoi, Naoki Kobayashi, Makiko Tazaki (*Japan Atomic Energy Agency*)

#### 9:45 a.m.

Development of a 3-D Global Equilibrium Cycle Methodology for PWRs, William R. Morgan, John C. Lee (*Univ of Michigan*)

#### 10:10 a.m.

Nuclear Fuel Cycle Code Review, Adrian Miron, Joshua Valentine, Majd Hawwari, John M. Christenson (*Univ of Cincinnati*), Mary Lou Duznik-Gougar, Jianwei Chen, Michael J. Lineberry (*Idaho State Univ*)

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**Accelerator Applications: General**, sponsored by AAD. *Session Organizer:* Denis Beller (*UNLV*). *Chair:* Phillip Ferguson (*ORNL*)

### Hanover A

#### 8:30 a.m.

Identification of Fissionable Materials Using the Tagged Neutron Technique, R. P. Keegan (*Remote Sensing Laboratory-Nellis*), J. P. Hurley, J. R. Tinsley, R. Trainham (*Special Technologies Laboratory*)

#### 9:00 a.m.

Development of Field Ion Desorption Structures for Piezoelectric-Based Neutron Generators, Emily Baxter, Scott Kovaleski, Andy Benwell (*Univ of Missouri, Columbia*)

### 9:30 a.m.

KIPT Cold Neutron Source Physics Analyses, Zhaopeng Zhong, Yousry Gohar, Roger Kellogg (*ANL*)

### 10:00 a.m.

MCNPX Photopion Production from Graphite, Gregg W. McKinney, Laurie S. Waters, Michael R. James (*LANL*)

### 10:30 a.m.

Integral Neutron Multiplicity Measurements from Cosmic Rays Interactions in Lead, T. E. Ward (*TechSource*), D. E. Beller (*UNLV*), A. A. Rimsky-Korsakov, N. A. Kudryashev (*V. G. Khlopin Radium Inst*)

## THURSDAY, JUNE 18, 2009 • 1:00 P.M.

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**Reactor Analysis Methods—II**, sponsored by RPD; cosponsored by MCD. *Session Organizer:* Fausto Franceschini (*Westinghouse*). *Chair:* Ivan G. Maldonado (*Univ of Tennessee*)

### Baker

#### 1:00 p.m.

Comparison of Modeling Options for Delayed Neutron Precursor Movement in a Molten Salt Reactor, Dalin Zhang, Andrei Rineiski (*FzK-Germany, Inst for Nuclear and Energy Technologies*), Suizheng Qiu (*Xi'an Jiaotong Univ*)

#### 1:25 p.m.

Development of Direct Simulation Method for Transient Three-Dimensional Neutron Transport, Huayun Shen, Kan Wang (*Tsinghua Univ—China*)

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**Recent Progress and Applications of Resonance Calculation Method**, sponsored by RPD. *Session Organizer:* Akio Yamamoto (*Nagoya Univ*). *Chair:* Akio Yamamoto

### Baker

#### 1:55 p.m.

A New Framework of Resonance Calculation Method Based on the Subgroup Method (1); Theory, Akio Yamamoto, Hiroki Koike, Yoshihiro Yamane (*Nagoya Univ*)

#### 2:20 p.m.

A New Framework of Resonance Calculation Method Based on the Subgroup Method (2); Calculation, Akio Yamamoto, Hiroki Koike, Yoshihiro Yamane (*Nagoya Univ*)

#### 2:45 p.m.

Recent Progress in Self-Shielding Phenomenon Modeling with the APOLLO2 Code, Mireille Coste-Delclaux (*CEA*), invited

#### 3:10 p.m.

The Resonance Treatment in the AEGIS Code, Naoki Sugimura, Masato Tabuchi (*Nuclear Engineering, Ltd.*), Akio Yamamoto (*Nagoya Univ*), Masahiro Tatsumi (*Nuclear Fuel Industries, Ltd.*)

#### 3:35 p.m.

Verification of Subgroup Weights Generated with Pin Cell Cross-Section Conservation, Gwan Young Kim, Han Gyu Joo, Un Chul Lee (*Seoul Natl Univ—Korea*)

*NOTE: This session will immediately follow the preceding session, which will begin at 1:00 p.m.*

**Thermal Aspects of Nuclear Material Handling and Environmental Monitoring**, sponsored by THD; cosponsored by ESD. *Cochairs:* Chang Oh (*INL*), Si Young Lee (*SRNL*)

**Dunwoody**

**1:00 p.m.**

Monitoring Waste Heat Rejection to the Environment via Remote Sensing, Alfred J. Garrett (*SRNL*), invited

**1:25 p.m.**

Assessing Robustness of a Nuclear Material Package Using Design of Experiment Methods, Narendra K. Gupta, Si Young Lee (*SRNL*)

**1:50 p.m.**

Thermal Analysis for In-tank Ion-Exchange Column Process, Si Y. Lee, Frank G. Smith, III (*SRNL*)

**2:15 p.m.**

Measurement of Temperatures in Full-Scale Waste Solidification Building Simulated High Activity Waste Drums as Input to Modeling, A. D. Cozzi, E. K. Hansen (*SRNL*)

**2:40 p.m.**

Thermal Cycling on Fatigue Failure of the Plutonium Vitrification Melter, Jeffrey M. Jordan, Jennifer L. Gorczyca (*SRNL*)

**MCNP/X Depletion/Burnup with VESTA–Tutorial**, sponsored by RPSD; cosponsored by RPD. *Session Organizer:* John Hendricks (*LANL*). *Cochairs:* Wim Haeck (*IRSN*), Russell D. Mosteller (*LANL*)

**Greenbriar**

**1:00 p.m.**

VESTA is a new capability for Monte Carlo burnup/depletion/transmutation calculations using either MCNP or MCNPX and either ORIGEN or CINDER90. VESTA has been developed and is now available from the Institut de Radioprotection et de Surete Nucleaire (IRSN), Fontenay-aux-Roses, France. VESTA is fast and accurate. Many shortcomings of multigroup burnup linking codes, such as MONTEBURNS, are overcome by an ultrafine 40,000 group structure. Many of the limitations, such as the need to specify isotopes in advance and pre-set burnup precision, of in-line burnup capabilities (as in MCNPX) are also overcome by the external VESTA approach. Consequently, VESTA offers an attractive Monte Carlo burnup/depletion, transmutation capability.

A number of laptop computers will be available for participants to try VESTA. Some familiarity with MCNP is helpful.

**Disseminating a Nonproliferation Culture Through Education–Panel**, sponsored by FCWMD (in collaboration with SCNN). *Session Organizer:* Caroline Jorant (*AREVA*). *Chair:* Caroline Jorant

**Kennesaw**

**1:00 p.m.**

In countries and regions where nuclear is already well developed a major effort is made in terms of training and education to prepare the human resources needed to match the challenge of the renewal of nuclear energy in a safe way. More and more those training programs and curricula include some education on nonproliferation issues.

It is indeed perceived that any employee working in the nuclear area, but especially engineers, should have some basic education about the nonproliferation regime, international institutions as well as on technical aspects linked to safeguarding nuclear material, and the notion of proliferation resistance.

Coming from different geographical regions, from university and from industrial backgrounds, the panelists will exchange on the objective, the content, and the organization of their program and the lessons learned from the past experience. The discussion should provide a forum to consider how to improve and enlarge this experience and reflect on how such programs may indeed contribute to a worldwide nonproliferation culture and to the overall nonproliferation regime. An exchange program between universities, companies, and institutions might emerge from such confrontation that would contribute to developing an international nonproliferation culture. Today's efforts that are still limited should be extended to educate students and workers in new countries considering developing nuclear energy.

**PANELISTS:**

- Alexander Solodov (*ORNL*)
- William S. Charlton (*Texas A&M Univ*)
- Debbie Dickman (*PNL*)
- Yusuke Kuno (*JAEA*)
- Mary Eipeldauer (*ORNL*)
- Other panelists to be determined.

**Waste and Used Fuel Management**, sponsored by FCWMD. *Session Organizer:* Brian Westphal (*INL*). *Chair:* Jim Hardeman (*Georgia Environmental Protection*)

**Techwood**

**1:00 p.m.**

The Exposure Dose Evaluation Modeling on Arbitrary Accident Resulted from the LILW Management, Min Ho Ahn, Kun Jai Lee (*KAIST–Korea*), Kyung Woo Choi (*KINS–Korea*)

**1:25 p.m.**

Radioactive Waste Management of Nuclear Power Plants, Mohammad Montazer (*Adia Golden Inc.*), Douna Montazer (*McMaster Univ*)

**1:50 p.m.**

Heat Load Characteristics of Thorium Based Molten Salt Spent Fuel, Stephen Janson, Laurence Miller (*Univ of Tennessee*)

**2:15 p.m.**

Rethinking Nuclear Waste Management Policy: Current Development and the Path Forward, Steven E. Skutnik, Man-Sung Yim (*NCSU*)

**2:40 p.m.**

The Sensitivity of Repository Capacity to the Separation Efficiency of TRUs and Fission Products, Jun Li (*Univ of North Carolina at Chapel Hill*), Man-Sung Yim (*NCSU*), David N. McNelis (*Univ of North Carolina at Chapel Hill*)

**3:05 p.m.**

Isotopic Characterization of Fission Product Hydrated Zirconium Molybdate ( $ZM_h$ ) Precipitates from Nuclear Material Processing, K. P. Crapse, N. E. Bibler, M. L. Crowder, R. A. Pierce (*SRNL*)

*Nuclear and Emerging Technologies for Space (NETS-2009) Embedded Topical Meeting  
is sponsored by the Aerospace Nuclear Science and Technology Technical Group*

*Publications sponsored by Lockheed Martin Space Systems Company*

*Co-sponsorship provided by the American Institute of Aeronautics and Astronautics*

**MEETING ORGANIZERS**

<u>General Co-Chair</u> Samit Bhattacharyya <i>Savannah River Site</i>	<u>General Co-Chair</u> George Schmidt <i>NASA Glenn Research Center</i>	<u>Technical Program Co-Chair</u> Shannon Bragg-Sitton <i>Texas A&amp;M University</i>	<u>Technical Program Co-Chair</u> Michael Houts <i>NASA Marshall Space Flight Center</i>	<u>Technical Program Co-Chair</u> Steven D. Howe <i>Idaho National Laboratory Center for Space Nuclear Research</i>	<u>Technical Program Co-Chair</u> John Scott <i>NASA Johnson Space Center</i>
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Publications Chair  
Shannon Bragg-Sitton  
*Texas A&M University*

Special Session Organizer and Chair  
Jon Webb  
*Idaho National Laboratory Center for Space Nuclear Research*

Session Chairs and Co-Chairs  
Shannon Bragg-Sitton, *Texas A&M University*  
Michael Houts, *NASA Marshall Space Flight Center*  
Steve Johnson, *Idaho National Laboratory*  
Jeff King, *Colorado School of Mines*  
Lou Qualls, *Oak Ridge National Laboratory*  
Jaime Reyes, *Lockheed Martin Space Systems*  
John Scott, *NASA Johnson Space Center*  
Pavel Tsvetkov, *Texas A&M University*  
James Werner, *Idaho National Laboratory*

Session Chairs and Co-Chairs  
David Dixon, *University of Tennessee*  
Steve Howe, *Center for Space Nuclear Research*  
Andrew Kadak, *Massachusetts Institute of Technology*  
David Poston, *Los Alamos National Laboratory*  
Robert Reid, *Los Alamos National Laboratory*  
Bruce Schnitzler, *NASA Glenn Research Center*  
Chris Steffen, *NASA Glenn Research Center*  
Jon Webb, *Center for Space Nuclear Research*  
Steve Wright, *Sandia National Laboratory*

**MONDAY, JUNE 15, 2009 • 1:00 P.M.**

**Opening Plenary: Nuclear and Emerging Technologies for Space,**

*Chairs: Samit Bhattacharyya (Savannah River Site), George Schmidt (NASA Glenn Research Center)*

**Hanover F and G**

SPEAKERS:

**1:00 p.m.**

Meeting Welcome, Samit Bhattacharyya (*Savannah River Site*)

**1:30 p.m.**

Overview of Missions Enabled by Space Nuclear Systems, George Schmidt (*NASA Glenn Research Center*) (invited)

**2:00 p.m.**

Recent Radioisotope Thermo-Electric Generator Power System Efforts at the Idaho National Laboratory: Pluto New Horizons and Mars Scientific Laboratory, Steve Johnson (*Idaho National Laboratory*)

**2:30 p.m.**

Advanced Radioisotope Power Systems, Dan Tantino (*Lockheed Martin Space Systems Company*)

**3:00 p.m.**

Lunar Fission Surface Power Systems, James Werner (*Idaho National Laboratory*)

**TUESDAY, JUNE 16, 2009 • 8:30 A.M.**

**Special Session: Nuclear Thermal Propulsion Systems,** *Chair: Jon Webb (Center for Space Nuclear Research)*

**Hanover C and D**

SPEAKERS:

**8:30 a.m.**

History of Nuclear Thermal Propulsion Systems, Mel Bulman (*Aerojet*)

**9:00 a.m.**

Lunar Applications for Nuclear Thermal Propulsion, Steve Howe (*Center for Space Nuclear Research*)

**9:30 a.m.**

Implications of NTP to Human Exploration of the Moon, Mars and Near Earth Objects, Stan Borowski (*NASA Glenn Research Center*)

**10:00 a.m.**

High Energy Outer Planetary Missions of Interest, Ralph McNutt (*Applied Physics Laboratory, Johns Hopkins*)

**10:30 a.m.**

Fuels Applicable to Nuclear Thermal Propulsion Reactor Cores, Samim Anghaie (*University of Florida*)

**11:00 a.m.**

Testing Options for Nuclear Thermal Propulsion Systems, James Werner (*Idaho National Laboratory*)

**TUESDAY, JUNE 16, 2009 • 1:00 P.M.**

**Fission Surface Power System and Component Design,** *Chairs: James Werner (INL), David Dixon (Univ of Tennessee)*

**Hanover C**

**1:00 p.m.**

Technology Readiness for Affordable Lunar and Mars Fission Surface Power Systems Based on Prior Liquid Metal Cooled Fast Reactor Programs, Sterling Bailey (*Bailey Engineering and Management, Inc.*)



**1:25 p.m.**

Reference Reactor Module Design for NASA's Lunar Fission Surface Power System, David I. Poston, Richard Kapernick, David Dixon (LANL), James Werner (INL), Louis Qualls (ORNL), Ross Radel (SNL)

**1:50 p.m.**

Recent Advances in Power Conversion and Heat Rejection Technology for Fission Surface Power, Lee Mason (NASA Glenn Research Center)

**2:15 p.m.**

Electromagnetic Pump Fabrication and Predicted Performance, James Werner (INL), Harold Adkins (PNNL)

**2:40 p.m.**

Technology Demonstration Unit Core Simulator Design, Thomas Godfroy (NASA MSFC), David I. Poston (LANL), Boise Pearson, Michael G. Houts (NASA MSFC)

**3:05 p.m.**

First Study for the Design of an Annular Linear Induction Pump for Nuclear Space Applications, C. O. Maidana (Washington State Univ and INL), J. Werner, D. M. Wachs (INL), H. R. Kim (KAERI), C. E. Baily, T. B. Harmer (INL)

**3:30 p.m.**

Liquid Metal Technology Options for a Lunar-Based Fission Surface Power System, Louis Qualls (ORNL), Abraham Weitzberg (Consultant)

**Radioisotope Power Systems Technology and Development, Chairs:**

Jaime Reyes (Lockheed Martin Space Systems), Steve Johnson (INL)

**Hanover D****1:00 p.m.**

Small Radioisotope Thermoelectric Generator Development and Deployment, Joseph Giglio, Thomas Hammel, Robert K. Sievers (Teledyne Energy Systems, Inc.), William Otting (Pratt & Whitney Rocketdyne, Inc.)

**1:25 p.m.**

Targets for On-Line Production of Neutron-Rich and Neutron-Deficient Isotopes, V. N. Panteleev (Russian Academy of Sciences), E. K. Dyakov (Inst of Scientific & Production Assoc 'LUCH')

**1:50 p.m.**

An Evaluation of Alternate Production Methods for Pu-238 General Purpose Heat Source Pellets, Mark Borland, Steve Frank (INL), Brad Patton, Brian Cowell (ORNL), Ken Chidester (Nuclear Fuel Technology Assoc)

**2:15 p.m.**

Production of Safe Radioisotope Heat Sources by Spark Plasma Sintering, Robert C. O'Brien, Richard M. Ambrosi (Univ of Leicester), Steven D. Howe (Center for Space Nuclear Research), Nigel P. Bannister, Helen V. Atkinson (Univ of Leicester)

**System Design and Materials Consideration for Nuclear Thermal Propulsion, Chairs:** Steve Howe (Center for Space Nuclear Research), Robert Reid (LANL)**Hanover E****1:00 p.m.**

Fabrication of Prismatic Fuel Elements for Space Power and Nuclear

Thermal Propulsion Reactors by Spark Plasma Sintering, R. C. O'Brien, R. M. Ambrosi (Univ of Leicester), S. D. Howe (Center for Space Nuclear Research), N. P. Bannister, H. V. Atkinson (Univ of Leicester)

**1:25 p.m.**

Fabrication and Testing of a Frozen Pebble Bed Tungsten Fuel Element Utilizing Spark Plasma Sintering and the Nuclear Thermal Rocket Element Environmental Simulator, Brian J. Gross (Center for Space Nuclear Research)

**1:50 p.m.**

Compilation of Tungsten-Rhenium Alloy Properties for Fast Space Reactor Power and Propulsion Applications, Jonathan A. Webb (Center for Space Nuclear Research)

**2:15 p.m.**

Material Performance Evaluation of TaC, WC, and ZrC Under Prototypic Nuclear Thermal Propulsion Hot Hydrogen Environment, Omar R. Mireles, Samim Anghaie, Brandon Cunningham, Brett Dooies (Univ of Florida)

**2:40 p.m.**

Monte Carlo Analysis of Tungsten-Rhenium Based Cermet Fast Reactors for Space Propulsion and Power Applications, Jonathan A. Webb (Center for Space Nuclear Research)

**WEDNESDAY, JUNE 17, 2009 • 8:30 A.M.**

**Simulation and Modeling of Fission Power Systems, Chairs:** Shannon Bragg-Sitton (Texas A&M), David Poston (LANL)

**Hanover C****8:30 a.m.**

Assessment of Zero Power Critical Experiments and Needs for a Fission Surface Power System, James R. Parry, John D. Bess (INL), Bradley T. Rearden (ORNL), Gary A. Harms (SNL)

**8:55 a.m.**

Applicability of Existing Critical Experiments with Beryllium Reflectors to Code Validation for the NASA Fission Surface Power Reactor, G. A. Harms, A. D. Barber (SNL)

**9:20 a.m.**

Dynamic Modeling of a Fission Surface Power System Using Stirling Power Conversion, Ross F. Radel, Steven A. Wright (SNL)

**9:45 a.m.**

Advances in Design and Modeling of the Reactor Core of OPUS, A. Likhov, S. Pascal, N. Jonquères (CEA)

**10:10 a.m.**

Closed Brayton Cycle Design for a Space Reactor, Lamartine Nogueira Frutuoso Guimarães (Inst for Advanced Studies/FATESF), Giannino Ponchio Camillo (Inst for Advanced Studies), Guilherme Moreira Placco (FATESF)

**10:35 a.m.**

Fuel Management Systems for Reduced Gravity Power Systems, Neil Dickes, Fred Best (Texas A&M)

**11:00 a.m.**

Statistical Analysis of Multiple Fluids in Microgravity Two-Phase Slug Flow via a Drift Flux Model, Benjamin Larsen, Cable Kurwitz, Frederick Best (Texas A&M)

**Power Conversion Technologies for Space Applications**, *Chairs:* Pavel Tsvetkov (*Texas A&M*), John Scott (*NASA Johnson Space Center*)

#### **Hanover D**

##### **8:30 a.m.**

Nuclear Enhanced MHD for Megawatt Space Power, Arlo J. Swallow (*Univ of Florida*)

##### **8:55 a.m.**

A Novel Modeling Technique for the Design and Optimization of Advanced Thermophotovoltaic Devices for Space Nuclear and RTG Applications, Sherif Michael (*Naval Postgraduate School*), Andrew L. Presby (*U.S. Navy*)

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**Lunar and Mars Exploration Architecture and Considerations for Space Bases**, *Chairs:* Jeff King (*Colorado School of Mines*), Michael Houts (*NASA Marshall Space Flight Center*)

#### **Hanover E**

##### **9:20 a.m.**

Development of a Nuclear-Powered Fully-Mobile Outpost for the Lunar Surface, Aaron E. Craft, Logan Sailer, Rick Henderson, Natasha Glazener, Josh Valentine, Steve Howe, Jeffrey King (*INL*)

##### **9:45 a.m.**

NTR-Enhanced Lunar-Base Supply Using Existing Launch Fleet Capabilities, John D. Bess (*INL*), Emily Colvin (*Georgia Tech*), Paul G. Cummings (*Univ of Michigan*)

##### **10:10 a.m.**

Nuclear Thermal Rocket/Vehicle Characteristics and Sensitivity Trades for NASA's Mars Design Reference Architecture (DRA) 5.0 Study, Stanley K. Borowski (*NASA Glenn Research Center*), David R. McCurdy (*ASRC Aerospace*), Thomas W. Packard (*Analex Corp*)

##### **10:35 a.m.**

Power Requirements for the NASA Mars Design Reference Architecture (DRA) 5.0, Robert L. Cataldo (*NASA Glenn Research Center*)

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### **WEDNESDAY, JUNE 17, 2009 • 1:00 P.M.**

**Hardware Fabrication and Testing in Support of Space Fission Systems Development**, *Chairs:* Steve Wright (*SNL*), Jon Webb (*Center for Space Nuclear Research*)

#### **Hanover C**

##### **1:00 p.m.**

Test Results from a Direct Drive Gas Reactor Simulator Coupled to a Brayton Power Conversion Unit, David S. Hervol, Maxwell H. Briggs, Albert K. Owen (*NASA Glenn Research Center*), Shannon M. Bragg-Sitton (*Texas A&M*), Thomas J. Godfroy (*NASA Marshall Space Flight Center*)

##### **1:25 p.m.**

Testing of an Integrated Reactor Core Simulator and Power Conversion System with Simulated Reactivity Feedback, Shannon M. Bragg-Sitton (*Texas A&M*), David S. Hervol (*NASA Glenn Research Center*), Thomas J. Godfroy (*NASA Marshall Space Flight Center*)

##### **1:50 p.m.**

Set-up and Testing of an Integrated Pumped NaK Loop and Stirling Power Conversion Subsystem, Thomas Godfroy, Boise Pearson, Michael G. Houts (*NASA Marshall Space Flight Center*)

##### **2:15 p.m.**

Review of Potential Degradation Mechanisms for the Upcoming Experimental Demonstration of Radiation Effects on the Performance of a Stirling-Alternator Converter, Omar R. Mireles, Samim Anghaie (*Univ of Florida*)

##### **2:40 p.m.**

Electronics Radiation Hardness Testing of Power MOSFETs, Jonathan A. Kulisek, Thomas E. Blue (*Ohio State*)

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**Utilization of Surface Fission Energy Sources and Radiation Protection and Shielding Considerations**, *Chairs:* Lou Qualls (*ORNL*), Bruce Schnitzler (*NASA Glenn Research Center*)

#### **Hanover D**

##### **1:00 p.m.**

Lunar Soil as In-Situ Shielding, S. Guetersloh (*NASA Johnson Space Center*), J. Miller (*LBNL*), L. Taylor (*Planetary Geosciences Inst/Univ of Tennessee*), C. Zeitlin (*Southwest Research Inst*), L. Heilbronn (*Univ of Tennessee*), T. Komiyama (*Japanese Aerospace Exploration Agency*), M. DiGiuseppe (*Northrop Grumman Corp*), Y. Iwata, T. Murakami (*National Institute of Radiological Sciences*)

##### **1:25 p.m.**

Radiation Shielding Architecture Studies for NASA's Lunar Fission Surface Power System, David I. Poston (*LANL*), Lee S. Mason (*NASA Glenn Research Center*), Michael G. Houts (*NASA Marshall Space Flight Center*)

##### **1:50 p.m.**

Axial Radiation Shielding for the Affordable Fission Surface Power System, Aaron E. Craft, Jeffrey C. King (*Colorado School of Mines*)

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**Major Challenges and Opportunities for Space Exploration**, *Chairs:* Andrew Kadak (*MIT*), Chris Steffen (*NASA Glenn Research Center*)

#### **Hanover E**

##### **2:15 p.m.**

The MCD Code System for Atmospheric and Exo-Atmospheric Neutron Time-of-Flight Simulation, William C. Sailor (*LANL*)

##### **2:40 p.m.**

Methods for Modeling Impact-Induced Reactivity Changes in Space Reactors, T. E. Radel, R. F. Radel, J. A. Smith, R. J. Lipinski (*SNL*), P. P. H. Wilson (*Univ of Wisconsin, Madison*)

##### **3:05 p.m.**

Radiation Challenges and Risk Mitigation for the Nuclear-Powered Jupiter Europa Orbiter Mission, K. Clark, T-Y Yan (*Jet Propulsion Laboratory*), J. Boldt (*John Hopkins Univ*), T. Van Houten, I. Jun, S. McClure, R. Rasmussen (*Jet Propulsion Laboratory*)

##### **3:30 p.m.**

Architectures Based on Direct Fission Fragment Energy Conversion for Interstellar Exploration, Pavel V. Tsvetkov (*Texas A&M*), Troy L. Guy (*Lockheed Martin*)

**“Preparing for the Nuclear Engineering Professional Engineering Exam”**

**Sunday, June 14, 2009**  
**8:30 a.m. - 5:00 p.m.**  
**Location: Hanover D Room**

**WORKSHOP ORGANIZER:**

**Dr. Robert D. Busch, PE**, Director, Nuclear Engineering Laboratory, University of New Mexico

**WORKSHOP PRESENTERS:**

**Kermit A. Bunde**, DOE – Idaho

**Dr. Robert D. Busch, PE**, University of New Mexico

**Gerald Loignon**, SCANA

**PURPOSE OF WORKSHOP:**

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 six basic skill areas; neutronics, instrumentation and measurements, nuclear power shielding, nuclear materials and fuels, and radioactive waste, 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 a sample exam and list of recommended resources for continued study.

**WORKSHOP OUTLINE:**

<b>TIME</b>	<b>TOPIC</b>	<b>PRESENTER</b>
8:30 AM – 9:00 AM	Introduction	
9:00 AM – 9:30 AM	Radioactive Waste	Dr. Robert D. Busch
9:30 AM – 10:30 AM	Neutronics	Kermit A. Bunde
10:30 AM – 11:30 AM	Nuclear Fuels	Gerald Loignon
11:30 AM – 1:00 PM	LUNCH (on your own)	
1:00 PM – 2:00 PM	Radiation Protection/Shielding	Dr. Robert D. Busch
2:00 PM – 3:30 PM	Nuclear Power/PRA	Gerald Loignon
3:30 PM – 4:30 PM	Instrumentation	Dr. Robert D. Busch
4:30 PM – 5:00 PM	Wrapup	

**“Sodium Cooled Fast Reactor Workshop”**

***GE Hitachi Nuclear Energy in cooperation with  
Energy Solutions Columbia Basin Consulting Group, LLC\* and  
Hamilton Sundstrand, Energy, Space & Defense – Rocketdyne\*\****

**Sunday, June 14, 2009  
8:00 a.m. - 5:00 p.m.  
Location: Hanover C Room**

**PURPOSE OF WORKSHOP:**

This workshop provides a technical overview of sodium fast reactor technology. Fast reactors can be used to fully close the nuclear fuel cycle since this fast spectrum reactor can consume transuranics produced in our currently operating reactors. Sodium-cooled fast reactors provide excellent safety characteristics and are versatile in their operating capabilities. The workshop will provide a thorough overview of fast reactors, covering history, physics, balance of plant, and US policy regarding fast reactor technology. In addition each participant will receive an electronic version of US SFR standards, reference materials, and presentation materials. Each technical session will include self-study problems that can be used as a teaching tool in the future. This workshop is geared towards nuclear professionals interested in gaining technical knowledge in fast reactors.

**WORKSHOP SCHEDULE:**

<b>Time</b>	<b>Topic</b>	<b>Presenter</b>
8:00 AM	Welcome and History of Sodium Fast Reactor Development	Loewen
8:15 AM	Basic Sodium Properties/Thermal Hydraulic Theory/ Transient Safety Analysis	Saha & Desai
9:15 AM	Fast Reactor Fuel Properties and Performance Characteristics	Carroll & Dooies
10:00 AM	Break	
10:15 AM	Fast Reactor Neutronics Overview	Wu & Triplett
11:00 AM	Managing Transuranic Inventory with LMRs	David Lucoff, Ph.D., MBA*
12:00 PM	Lunch (not provided)	
1:00 PM	General Design Criteria for Sodium Fast Reactors	Carroll & Miller
1:45 PM	Introduction to EM Pumps	Fanning & Anderson
2:30 PM	Break	
2:45 PM	Fast Reactor Neutronic Analysis Methods	Wu & Caldwell
3:30 PM	Unique Issues of Sodium Technology	McDowell & Johnson**
4:30 PM	Fast Reactor Policy: CRBRP, GNEP, and Future Energy Parks	Loewen

**Modular HTGR Technology Course (2-Day Workshop)**

**Thursday, June 18, 2009**  
**8:00 a.m. - 5:00 p.m.**  
**Location: Regency VI**

**Friday, June 19, 2009**  
**8:00 a.m. - 5:00 p.m.**  
**Location: Regency VI**

**THURSDAY, JUNE 18, 2009 • 8:00 AM – 5:00 PM**

<b>Time</b>	<b>Topic</b>	<b>Presenter</b>
8:00 AM	Course introduction & agenda overview	Madeline Feltus
8:15 AM	Modular HTGR characteristics	Syd Ball
8:45 AM	History & background of gas reactors	Arkal Shenoy
9:30 AM	PBMR	Ed Wallace
10:15 AM	Break	
10:30 AM	GT-MHR	Arkal Shenoy
11:15 AM	HTR-PM (China)	Syd Ball
12:00 PM	Lunch	
1:00 PM	AREVA	Lew Lommers
1:45 PM	Energy conversion & process heat	Scott Penfield
3:15 PM	Break	
3:30 PM	Core T/H	Syd Ball
4:00 PM	Graphite	Pete Pappano
4 :45 PM	Time for questions/answers	Syd Ball/Madeline Feltus

**FRIDAY, JUNE 19, 2009 • 8:00 AM – 5:00 PM**

<b>Time</b>	<b>Topic</b>	<b>Presenter</b>
8:00 AM	High-temp materials	Bill Corwin
8:45 AM	Fission product release and transport	John Bolin
9:45 AM	Break	
10:00 AM	Fuel design, manufacture, performance	Madeline Feltus
11:30 AM	Accident selection	John Bolin
12:00 PM	Licensing	John Bolin
12:30 PM	Lunch	
1:30 PM	Accident analysis	Syd Ball
2:15 PM	Core Reactor physics	Madeline Feltus
3:00 PM	Break	
3:15 PM	I&C and Safety Margins	Ted Quinn
4:00 PM	Questions and Answers from students	
4:30 PM	Wrap-up	Syd Ball/Madeline Feltus
4:45 PM	Course evaluation	

**TUESDAY, JUNE 16, 2009**

**4:00 P.M. – 6:00 P.M.**

**LOCATION: REGENCY V (HYATT REGENCY ATLANTA HOTEL)**

### **INTRODUCTION**

The American Nuclear Society (“ANS”) with the assistance of Halter Financial Group, L.P., Pillsbury Winthrop Shaw Pittman, LLP and ROTH Capital Partners is organizing a series of workshops on cutting-edge capital financing techniques for nuclear industry-focused companies. The workshops are geared toward Chief Executive Officers, Chief Financial Officers and other senior staff of emerging and mid-sized companies which are seeking expansion capital to respond to the unprecedented growth anticipated in the nuclear industry over the next decade. Two workshops are planned for 2009.

A comprehensive workshop will be offered at the ANS Winter Meeting in November 2009 in Washington, DC. A half day will be devoted to an in-depth look at alternative financing techniques that are being exercised in this difficult financial environment.

A two hour introductory workshop will be offered in June, 2009 at the Annual Meeting of the ANS in Atlanta.

### **PREPARING FOR THE NUCLEAR RENAISSANCE**

A nuclear renaissance, driven by environmental concerns, increased energy demand, climate change, and increased public acceptance of nuclear power, is poised to revolutionize the nuclear industry and create new opportunities for nuclear-power focused companies of all sizes. Growth in the nuclear industry is a global phenomenon as a myriad of countries have committed to build new reactors and expand existing capacity. Over 40 new reactors are now being constructed around the world with an additional 90 expected to become operational during the next ten years and 200 more planned for the following decade. The nuclear renaissance is triggering extraordinary demand for products and services. This exceptional growth presents challenges and opportunities for companies, both large and small, that operate in the industry.

In an industry as capital intensive as the nuclear power industry, companies with ample capital resources will be well-positioned to respond to expected demand for their products and services. Under-capitalized companies will fail. Emerging and mid-sized companies (i.e., companies with revenues ranging from \$10 million to \$200 million) need access to creative alternatives to satisfy their capital resource demands. Large IPOs with bulge bracket banks may not be a viable, readily available option, and venture capital and private equity financing may not provide a sufficient amount of capital.

Several alternative financing techniques can be utilized by these companies to effectively raise capital. For instance, Alternative Public Offerings, or APOs<sup>1</sup>, offer an efficient and immediate source of between \$5 and \$50 million in capital to emerging and mid-sized companies. The workshop will inform conference attendees about alternative financing techniques, give concrete examples of other companies and industries that have capitalized on alternative financing techniques and explain their applicability to the nuclear industry.

### **TARGET COMPANY AND TARGET AUDIENCE**

The target audience for the presentations are the persons within the management team of a company in the nuclear power industry that are responsible for raising capital, including the Chairman, CEO, CFO, board members and members of the finance department.

The characteristics of companies that would benefit most from this workshop are:

- Privately held
- Provides products or services to the nuclear power industry
- Seeks \$5 million to \$50 million in growth capital to expand operations
- Desires to benefit from the advantages of being a publicly-traded company while at the same time being fiscally able to bear the economic and other burdens of being a public company
- Has annual revenues between \$10 million and \$200 million or more
- Is profitable with positive net income

The presentation may also benefit fund managers interested in investing in companies in the nuclear power sector.

*Workshop agenda is on the next page!*

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<sup>1</sup> APO is a registered trademark of Halter Financial Group, L.P.

**TUESDAY, JUNE 16, 2009**  
**4:00 P.M. – 6:00 P.M.**  
**LOCATION: REGENCY V (HYATT REGENCY ATLANTA HOTEL)**

**WORKSHOP AGENDA**

<b>TIME</b>	<b>TOPIC</b>	<b>PRESENTER</b>
4:00 PM – 4:05 PM	Introduction of Panelists and Topics	Joseph R. Tiano, Jr., Moderator
4:05 PM – 4:15 PM	Growth of the Nuclear Industry <ul style="list-style-type: none"><li>• Growth trends</li><li>• Availability of capital</li><li>• Overview of existing public companies in nuclear industry</li></ul>	Brian Kremer, ROTH Capital Partners
4:15 PM – 4:40 PM	Overview and Background of Alternative Public Offerings and Mini-IPOs <ul style="list-style-type: none"><li>• Performance of APOs</li><li>• Mini-IPOs opportunities</li></ul>	George Diamond, Halter Financial Al Longfield, CFA, ROTH Capital Partners
4:40 PM – 5:05 PM	Transactional Mechanics of an APO and Mini-IPOs <ul style="list-style-type: none"><li>• Timeline to complete</li><li>• Cost</li><li>• Parties involved</li></ul>	Louis A. Bevilacqua, Pillsbury Winthrop Shaw Pittman Joseph R. Tiano, Jr., Pillsbury Winthrop Shaw Pittman
5:05 PM – 5:30 PM	Perspective from an APO and Mini-IPO Investor <ul style="list-style-type: none"><li>• Ideal financing metrics</li><li>• Valuation</li><li>• Growth trajectory</li></ul>	Nuclear Industry Investors
5:30 PM – 5:45 PM	Implications of Being a Public Company <ul style="list-style-type: none"><li>• Reporting obligations</li><li>• Access to capital markets</li></ul>	All Panelists
5:45 PM – 6:00 PM	Open Forum — Q&A	All Panelists

## Potential Nuclear Criticality Safety Evaluation Improvements for Operational Efficiencies

**Friday, June 19, 2009**  
**8:00 a.m. - 5:00 p.m.**  
**Location: Regency V**

### WORKSHOP SCHEDULE:

TIME	SUBJECT
8:00 AM – 8:15 AM	Welcome/Introduction <i>(Chuan-Fu Wu/Robert Wilson – EM-60)</i>
8:15 AM – 8:30 AM	DOE Regulation Revisions (re. NCS/NDA) <i>(James B. O'Brien, DOE HS-21)</i>
8:30 AM – 8:45 AM	EFCOG NCS Subgroup Activities <i>(Kevin Carroll, LLNL)</i>
8:45 AM – 10:15 AM	Regulation Needs/Revisions (TOPIC #1) <i>(Fitz Trumble, WSMS)</i>
10:15 AM – 10:30 AM	Break
10:30 AM – 11:30 AM	NCS Evaluation Training (TOPIC #2) <i>(James Morman, ANL)</i>
11:30 AM – 1:00 PM	Lunch
1:00 PM – 1:30 PM	NCS Evaluation Repository (TOPIC #4) <i>(James Felty, SAIC)</i>
1:30 PM – 3:00 PM	Technical Needs Strategic Dev. (TOPIC #7) <i>(Mike Westfall, ORNL)</i>
3:00 PM – 3:15 PM	Break
3:15 PM – 3:45 PM	Lessons Learned
3:45 PM – 5:00 PM	Study/Review of Workshop White Papers (TOPIC #s 3, 5, 6, 9, 10, 11) <i>(Robert Wilson, DOE EM-61)</i>

TOPIC# 1	Inconsistencies between DOE Orders, Standards, and Guides results in inefficiencies in implementation (e.g. 1027, 3009, 3007, 420.1B) and clarity of expectations is lacking <i>(Trumble)</i>
TOPIC# 2	Inadequate Criticality Safety Evaluations may lead to stop work and inefficiencies <i>(Morman, Garcia)</i>
TOPIC# 3	Lack of support for mass characterization processes and lack of standards creates inefficiencies in controls and application <i>(Berg, Hines)</i>
TOPIC# 4	Lack of repository for NCS evaluations and data leads to re-generation of analyses and re-creation of controls for common operations <i>(Scott, Felty)</i>
TOPIC# 5	Lack of standardized methodology for common NCS evaluations lead to inefficiency and create problems when material is transferred from one location to another <i>(Cise)</i>
TOPIC# 6	Criticality Detection and alarm methods are not tailored to the different EM activities, which leads to confusion and possible excessive control of the risk. <i>(Rumble, Hawks)</i>
TOPIC# 7	Experiments and/or Data needs to enhance EM mission work and reduce cost/schedule <i>(Westfall)</i>
TOPIC# 8	Ineffective use of data from non-conformances, lessons learned, and corrective actions lead to repetitive problems at EM sites. <i>(Berg)</i>
TOPIC# 9	Contracting practices hinder effective criticality safety programs <i>(Wilson, Wu)</i>
TOPIC# 10	Retiring workforce and nuclear industry growth is creating deficiencies in qualified staffing <i>(Wessels)</i>
TOPIC# 11	Funding, Resources, Contractor & DOE Management Commitment, Support, and Monitoring <i>(Wu, Chung)</i>



**NATIONAL COMMITTEES**

**Accreditation Policies and Procedures**

SUNDAY, 5:00 P.M. – 7:00 P.M.  
LOCATION: Baker

**Board of Directors**

*Professional Division Reports*

WEDNESDAY, 4:00 P.M. – 6:00 P.M.  
LOCATION: Regency VII

*Board of Directors*

THURSDAY, 8:00 A.M. – 5:00 P.M.  
LOCATION: Regency VII

**Business Meeting**

MONDAY, 4:15 P.M. – 5:15 P.M.  
LOCATION: Courtland

**Bylaws and Rules**

SUNDAY, 1:30 P.M. – 4:00 P.M.  
LOCATION: Techwood

**Finance**

TUESDAY, 4:00 P.M. – 7:00 P.M.  
LOCATION: Marietta

**Honors and Awards**

MONDAY, 4:00 P.M. – 6:00 P.M.  
LOCATION: Auburn

**International**

SUNDAY, 11:30 A.M. – 2:30 P.M.  
LOCATION: Hanover A & B

**Local Sections/Workshop**

SUNDAY, 8:00 A.M. -12:00 P.M.  
LOCATION: Hanover F

**Membership**

SUNDAY, 11:00 A.M. – 1:00 P.M.  
LOCATION: Techwood

**National Program Committee (NPC)**

*Program*

WEDNESDAY, 4:00 P.M. – 7:00 P.M.  
LOCATION: Regency V

*Screening and International*

MONDAY, 4:00 P.M. – 6:00 P.M.  
LOCATION: Regency V

**NEED**

SUNDAY, 7:30 P.M. – 9:30 P.M.  
LOCATION: Greenbriar

**Planning**

SUNDAY, 2:00 P.M. – 6:00 P.M.  
LOCATION: Vinnings

**President's Meetings**

*with Committee Chairs*

SUNDAY, 9:00 A.M. – 10:30 A.M.  
LOCATION: Centennial 4

*with Division Chairs*

SUNDAY, 10:30 A.M. – 11:30 A.M.  
LOCATION: Centennial 4

**Professional Development Workshop**

TUESDAY, 7:30 A.M. – 8:30 A.M.  
LOCATION: Auburn

**Professional Divisions**

*Committee Meeting*

TUESDAY, 4:00 P.M. – 6:30 P.M.  
LOCATION: Regency VI

*Training Workshop*

SATURDAY, 5:00 P.M. – 8:00 P.M.  
LOCATION: Dunwoody

**Professional Engineering Exam**

SUNDAY, 4:00 P.M. – 6:00 P.M.  
LOCATION: Fairlie

*PE Exam Writing Group*

SATURDAY, 6:00 P.M. – 10:00 P.M.  
LOCATION: Greenbriar

**Professional Women in ANS**

MONDAY, 11:30 A.M. – 1:00 P.M.  
LOCATION: Marietta

**Public Information**

SUNDAY, 4:00 P.M. – 6:00 P.M.  
LOCATION: Hanover F

**Public Policy**

WEDNESDAY, 11:30 A.M. – 1:30 P.M.  
LOCATION: Hanover G

**Publications Steering**

*Book Publishing*

SUNDAY, 11:00 A.M. – 12:00 P.M.  
LOCATION: Marietta

*Meetings, Proceedings and Transactions*

MONDAY, 7:30 A.M. – 8:30 A.M.  
LOCATION: Marietta

*Nuclear News Editorial Advisory*

SUNDAY, 4:00 P.M. – 5:30 P.M.  
LOCATION: Marietta

*Publications Steering*

MONDAY, 4:00 P.M. – 6:00 P.M.  
LOCATION: Marietta

*Technical Journals*

SUNDAY, 1:00 P.M. – 3:30 P.M.  
LOCATION: Marietta

**Scholarship Policy and Coordination**

MONDAY, 1:00 P.M. – 2:00 P.M.  
LOCATION: Auburn

**Student Sections**

*Executive*

MONDAY, 6:00 P.M. – 7:00 P.M.  
LOCATION: Dunwoody

*Reports*

MONDAY, 7:00 P.M. – 8:00 P.M.  
LOCATION: Dunwoody

**SPECIAL COMMITTEES**

**Development**

MONDAY, 7:15 A.M. – 8:15 A.M.  
LOCATION: Auburn

**Government Relations**

TUESDAY, 1:30 P.M. – 3:30 P.M.  
LOCATION: Auburn

**Nuclear Nonproliferation**

SUNDAY, 2:00 P.M. – 4:00 P.M.  
LOCATION: Harris

**OTHER COMMITTEES**

**17th PBNC Organizing Committee**

MONDAY, 4:00 P.M. – 6:00 P.M.  
LOCATION: Chicago A

**CNF**

MONDAY, 7:30 P.M. – 10:00 P.M.  
LOCATION: Auburn

**DOE Nuclear Energy University Programs – Progress Review**

TUESDAY, 1:00 P.M. – 3:30 P.M.  
LOCATION: Executive Conference Suite 222

**Eagle Alliance Board of Directors**

SUNDAY, 1:00 P.M. – 3:30 P.M.  
LOCATION: Greenbriar

**INL LWR Steering Committee**

WEDNESDAY, 8:00 A.M. – 5:00 P.M.  
LOCATION: Executive Conference Suite #223

THURSDAY, 8:00 A.M. – 5:00 P.M.

LOCATION: Executive Conference Suite #223

**Item Writer's Workshop**

SATURDAY, 6:00 P.M. – 10:00 P.M.  
LOCATION: Greenbriar

**Mathematics and Computation/ Reactor Physics/ Radiation Protection & Shielding Joint Benchmark Meeting**

SUNDAY, 11:00 A.M. – 1:00 P.M.  
LOCATION: Inman

**NEDHO**

MONDAY, 4:30 P.M. – 6:00 P.M.  
LOCATION: Learning Center

**Utility Integration Oversight**

TUESDAY, 9:00 A.M. – 11:00 A.M.  
LOCATION: Hanover G

**Utility Liaison Workshop**

TUESDAY, 12:00 P.M. – 6:00 P.M.  
LOCATION: Regency VI

**UWC 2009 Planning Committee**

SUNDAY, 12:00 P.M. – 1:00 P.M.  
LOCATION: Greenbriar

**DIVISION COMMITTEES**

**Accelerator Applications**

*Executive*

MONDAY, 11:30 A.M. – 1:30 P.M.  
LOCATION: Chicago A

**Aerospace Nuclear Science and Technologies**

SUNDAY, 12:00 P.M. – 2:00 P.M.  
LOCATION: Harris

**Biology and Medicine**

*Committee of the Whole*

SUNDAY, 4:00 P.M. – 5:30 P.M.  
LOCATION: Techwood

*Computational Medical Physics*

*Working Group*

SUNDAY, 10:00 A.M. – 11:00 A.M.  
LOCATION: Inman

**Decommissioning, Decontamination and Reutilization**

*Committee Meeting*

SUNDAY, 1:00 P.M. – 5:00 P.M.  
LOCATION: Dunwoody

**Education and Training**

*Alpha Nu Sigma*

SUNDAY, 1:00 P.M. – 2:00 P.M.  
LOCATION: Courtland

*Executive/Membership/ Honors and Awards*

SUNDAY, 1:30 P.M. – 4:00 P.M.  
LOCATION: Fairlie

*Nuclear Workforce Working Group*

SUNDAY, 12:00 P.M. – 1:30 P.M.  
LOCATION: Fairlie

*Program*

SUNDAY, 10:30 A.M. – 12:00 P.M.  
LOCATION: Fairlie

## COMMITTEE MEETINGS

### Education and Training

#### *University/Industry/ Government Relations*

SUNDAY, 9:30 A.M. – 10:30 A.M.  
LOCATION: Fairlie

### Environmental Sciences

#### *ESD Special Committee on Climate Change*

SUNDAY, 1:00 P.M. – 3:00 P.M.  
LOCATION: Baker

#### *Executive*

SUNDAY, 10:00 A.M. – 12:00 P.M.  
LOCATION: Auburn

#### *Nuclear Production of Hydrogen Working Group*

SUNDAY, 12:00 P.M. – 1:00 P.M.  
LOCATION: Auburn

#### *Program*

SUNDAY, 8:30 A.M. – 10:00 A.M.  
LOCATION: Auburn

### Fuel Cycle and Waste Management

#### *Executive*

SUNDAY, 1:00 P.M. – 2:30 P.M.  
LOCATION: Hanover F

#### *Program*

SUNDAY, 12:00 P.M. – 1:00 P.M.  
LOCATION: Hanover F

#### *Technical Operating and Standards Committee*

SUNDAY, 2:30 P.M. – 3:30 P.M.  
LOCATION: Hanover F

### Fusion Energy

#### *Executive*

SUNDAY, 3:00 P.M. – 5:00 P.M.  
LOCATION: Baker

### Human Factors, Instrumentation, and Controls

#### *Executive/Program*

TUESDAY, 12:00 P.M. – 1:30 P.M.  
LOCATION: Auburn

### Isotopes and Radiation

#### *Executive*

SUNDAY, 2:30 P.M. – 4:00 P.M.  
LOCATION: Piedmont

#### *Joint Program Committee – I&R and B&M*

SUNDAY, 1:30 P.M. – 2:30 P.M.  
LOCATION: Piedmont

### Materials Science and Technology

#### *Executive*

MONDAY, 7:00 P.M. – 9:00 P.M.  
LOCATION: Marietta

### Mathematics and Computation

#### *Computational Medical Physics Working Group*

SUNDAY, 10:00 A.M. – 11:00 A.M.  
LOCATION: Techwood

#### *Executive*

SUNDAY, 2:00 P.M. – 4:00 P.M.  
LOCATION: Spring

#### *Program*

SUNDAY, 1:00 P.M. – 2:00 P.M.  
LOCATION: Spring

### Nuclear Criticality Safety

#### *Education Meeting*

SUNDAY, 1:00 P.M. – 2:00 P.M.  
LOCATION: Inman

#### *Executive*

SUNDAY, 3:00 P.M. – 4:30 P.M.  
LOCATION: Inman

#### *Program*

SUNDAY, 2:00 P.M. – 3:00 P.M.  
LOCATION: Inman

### Nuclear Installation Safety

#### *Executive*

SUNDAY, 7:30 P.M. – 9:30 P.M.  
LOCATION: Kennesaw

#### *Program*

SUNDAY, 4:00 P.M. – 6:00 P.M.  
LOCATION: Kennesaw

### Operations and Power

#### *Executive*

SUNDAY, 4:00 P.M. – 6:00 P.M.  
LOCATION: Centennial 4

#### *Nuclear Construction Working Group*

SUNDAY, 12:30 P.M. – 2:30 P.M.  
LOCATION: Centennial 4

#### *Program*

SUNDAY, 2:30 P.M. – 4:00 P.M.  
LOCATION: Centennial 4

### Radiation Protection and Shielding

#### *Executive*

MONDAY, 5:00 P.M. – 6:30 P.M.  
LOCATION: Vinnings

#### *Program*

MONDAY, 4:00 P.M. – 5:00 P.M.  
LOCATION: Vinnings

### Reactor Physics

#### *Executive*

SUNDAY, 4:00 P.M. – 6:00 P.M.  
LOCATION: Auburn

#### *Goals and Planning*

SUNDAY, 1:00 P.M. – 2:00 P.M.  
LOCATION: Auburn

### Reactor Physics

#### *Honors and Awards*

SUNDAY, 10:00 A.M. – 11:00 A.M.  
LOCATION: Greenbriar

#### *Program*

SUNDAY, 2:00 P.M. – 4:00 P.M.  
LOCATION: Auburn

### Robotics and Remote Systems

#### *Executive*

SUNDAY, 12:00 P.M. – 4:00 P.M.  
LOCATION: Kennesaw

### Thermal Hydraulics

#### *Executive*

SUNDAY, 5:00 P.M. – 7:00 P.M.  
LOCATION: Courtland

#### *Program*

SUNDAY, 3:00 P.M. – 5:00 P.M.  
LOCATION: Courtland

### Young Member Group

#### *Executive Committee*

SUNDAY, 7:00 A.M. – 9:00 A.M.  
LOCATION: Auburn

## STANDARDS COMMITTEES

### ANS Standards Board

TUESDAY, 8:30 A.M. – 5:00 P.M.  
LOCATION: Hanover F

### ANS-8.1

TUESDAY, 7:00 A.M. – 8:30 A.M.  
LOCATION: Chicago A

### ANS-8.20

SUNDAY, 9:00 A.M. – 12:00 P.M.  
LOCATION: Harris

### ANS-8.21

TUESDAY, 7:00 A.M. – 8:30 A.M.  
LOCATION: Executive Conference  
Suite #222

THURSDAY, 7:00 A.M. – 8:30 A.M.

LOCATION: Executive Conference  
Suite #222

### ANS-8.22

TUESDAY, 8:00 A.M. – 10:00 A.M.  
LOCATION: Executive Conference  
Suite #223

### ANS-8.xx

MONDAY, 7:00 A.M. – 8:30 A.M.  
LOCATION: Executive Conference  
Suite #222

### ANS-10.7

#### *ANS-10.7 Working Group*

SATURDAY, 9:00 A.M. – 5:00 P.M.  
LOCATION: Fairlie

### ANS-19

MONDAY, 8:30 A.M. – 10:30 A.M.  
LOCATION: Vinnings

### ANS-19.1

MONDAY, 11:30 A.M. – 12:30 P.M.  
LOCATION: Vinnings

### ANS-19.3

MONDAY, 10:30 A.M. – 11:30 A.M.  
LOCATION: Vinnings

### ANS-28/ANS-53.1

WEDNESDAY, 8:00 A.M. – 5:00 P.M.  
LOCATION: Vinnings

THURSDAY, 8:00 A.M. – 12:00 P.M.  
LOCATION: Vinnings

### ANS-58.8

TUESDAY, 1:00 P.M. – 4:00 P.M.  
LOCATION: Chicago A

### ANS-58.14

TUESDAY, 8:00 A.M. – 5:00 P.M.  
LOCATION: Harris

### ANS-58.25

WEDNESDAY, 8:00 A.M. – 5:00 P.M.  
LOCATION: Harris

### N-16 Committee

MONDAY, 1:00 P.M. – 6:00 P.M.  
LOCATION: Executive Conference  
Suite #222

### NFSC

MONDAY, 10:00 A.M. – 6:00 P.M.  
LOCATION: Hanover E

### NFSC ExC

SUNDAY, 7:00 P.M. – 10:00 P.M.  
LOCATION: Vinnings

### RISC

WEDNESDAY, 8:00 A.M. – 5:00 P.M.  
LOCATION: Hanover F

# ANS Organization Members

## **A**are-Tessin Ltd. for Electricity (Atel)

AECL  
Alaron Corporation  
Ameren-UE  
American Electric Power Service Corp.  
American Nuclear Insurers  
ANATECH Corporation  
AREVA NC  
AREVA NP  
Arizona Public Service Co.  
Assurx, Inc.  
AT&F Nuclear, Inc.

## **B**abcock & Wilcox Company

Barnhart Nuclear Services  
Battelle Memorial Institute  
Bechtel Power Corp.  
Bigge Crane and Rigging Co.  
BKW FMB Energie Ltd.  
Black & Veatch  
R. Brooks Associates, Inc.  
Burns & Roe Enterprises, Inc.

## **C**entral Research Laboratories

Ceradyne  
Constellation Energy  
CP&L and Florida Power-Progress  
Energy Companies

## **D**ade Moeller & Associates

Detroit Edison Company  
Dominion Generation  
DuBose National Energy Service  
Duke Energy Corporation

## **E**nergy Future Holdings Corp. (Luminant)

EnergySolutions  
Entergy Operations Inc.  
Enterprise Informatics  
EPRI  
EXCEL Services Corporation  
Exelon Nuclear Co.

## **F**ederation of Electric Power

Companies of Japan  
FENOC  
Florida Power & Light

## **G**eneral Atomics

GE-Hitachi Nuclear Energy  
GeoEngineers

## **H**ans Walischmiller GMBH

Hayward Tyler, Inc.  
Huron Consulting Group

## **I**ndiana Michigan Power Co./

D.C. Cook Nuclear Power Plant  
Institute of Nuclear Safety Systems, Inc.

## **K**ernkraftwerk Leibstadt AG

Kinectrics Inc.  
Kinometrics Inc.  
Korea Atomic Industrial Forum, Inc.  
Krsko Nuclear Power Plant

## **L**awrence Livermore National Laboratory

Los Alamos National Laboratory  
L-3 Communications MAPPS Inc.

## **M**ajor Tool & Machine, Inc.

Marshield - Div. of Mars Metal Company  
McCallum-Turner, Inc.  
Mega-Tech Services, LLC

## **N**avarro Research & Engineering

Nebraska Public Power District  
NEI  
Nexus Technical Services Corporation  
Nordostschweizerische Kraftwerke AG  
Northrop Grumman Shipbuilding  
Nuclear Fuel Services, Inc.  
Nuclear Management Co., LLC  
Nuclear Plant Journal

## **O**maha Public Power District

Ontario Power Generation  
Overly Manufacturing Company

## **P**acific Gas & Electric Co.

Pakistan Atomic Energy Commission  
PaR Nuclear, Inc.  
PaR Systems, Inc.  
Phoenix Contact Inc.  
PPL Susquehanna, LLC  
Private Fuel Storage, LLC

## **R**eef Industries, Inc.

Rigging International  
ROS, Inc. (Remote Ocean Systems, Inc.)

## **S**AIC

Sandia National Laboratories  
Sargent & Lundy  
Southern California Edison  
Southern Nuclear Operating Co.  
Stone & Webster Engineering Inc./  
The Shaw Group

## **T**echnical Associates

Tennessee Valley Authority  
Thermo Fisher Scientific  
TradeTech, LLC

## **U**niversity of Missouri – Columbia

Research Reactor (MURR)  
UR-Energy USA Inc.  
URS Washington Division  
USEC Inc.

## **W**estinghouse Electric Corp.

Wyle Laboratories

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The American Nuclear Society (ANS) is an international, not-for-profit, scientific and educational organization consisting of about 11,000 individual members, more than 1,600 organizations, 70 Organization Members, 20 professional divisions/technical groups, 51 U.S. and 9 non-U.S. local sections/affiliated societies, 14 plant branches, and 34 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.



