ANS Conference

2014 Winter Meeting and Nuclear Technology Expo

60 YEARS
Dedicated to Professional Exchange and Public Service

Nuclear-The Foundation of Clean Energy

Embedded Topical Meeting:
Technology of Fusion Energy (TOFE)

Official Program

November 9–13, 2014
***Disneyland*® Hotel**
Anaheim, CA

ANS Meeting

2014 Winter Meeting and Technology Expo

Gold Sponsorship

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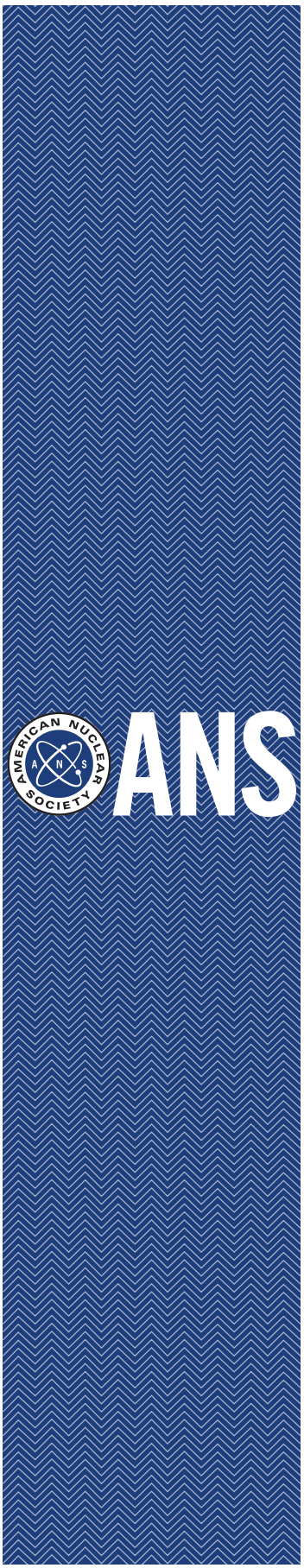


General Meeting Information

Plenary and Special Sessions Information

2014 ANS Winter Meeting Technical Sessions

Embedded Topical Meeting: TOFE 2014

Additional

2014 ANS Winter Meeting

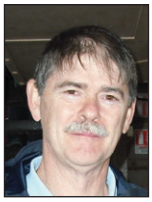
"Nuclear-The Foundation of Clean Energy"

General Chair:
Edward Halpin
Pacific Gas & Electric Co.

Assistant General Chair:
Lynn Walter
Light Water Solutions, LLC

Technical Program Chair:
Patrick J. Pinhero
University of Missouri/Columbia

Assistant Program Chair:
John Bess
Idaho National Laboratory



Assistant Program Chair:
James J. Byrne
Byrne & Associates LLC

Media Chair:
Maureen Brown
Southern California Edison

Finance Chair:
Ted Quinn
Consultant

Technical Tour Chair:
George Miller
University of California Irvine

Student Program Co-Chair:
Jeremy Pearson
University of California Irvine

Student Program Co-Chair:
Kara Jeanne Phillips
University of California Irvine

SATURDAY, NOVEMBER 8

8:00 a.m. - 5:00 p.m. Workshop for K12 Science Educators

SUNDAY, NOVEMBER 9

1:00 p.m. - 1:30 p.m. First-Time Attendee Orientation
4:00 p.m. - 5:00 p.m. Student Program Q & A Meeting
5:00 p.m. - 6:00 p.m. Mentoring Program
6:00 p.m. - 8:00 p.m. ANS President's Reception
6:00 p.m. - 8:00 p.m. ANS Nuclear Technology Expo

MONDAY, NOVEMBER 10

8:00 a.m. - 11:30 a.m. ANS Winter Meeting: Opening Plenary Session: Nuclear: The Foundation of Clean Energy
11:30 a.m. - 1:00 p.m. Attendee Luncheon – Technology Expo
11:30 a.m. - 5:00 p.m. ANS Nuclear Technology Expo
1:00 p.m. - 4:00 p.m. ANS Winter Meeting: Technical Sessions
1:30 p.m. - 6:00 p.m. TOFE: Technical Sessions
4:00 p.m. - 6:00 p.m. ANS President's Special Session

TUESDAY, NOVEMBER 11

8:00 a.m. - 10:05 a.m. TOFE Plenary Session—I
8:30 a.m. - 11:30 a.m. ANS Winter Meeting: Technical Sessions
10:00 a.m. - 12:00 p.m. ANS Special Session: Global Seismic Safety Issues After the Fukushima Daiichi Accident: On Identification and Treatment of Uncertainty about Seismic Issues–Panel
10:00 a.m. - 2:00 p.m. ANS NuclearTechnology Expo
10:30 a.m. - 12:30 p.m. TOFE: Technical Sessions
11:30 a.m. - 1:00 p.m. Attendee Luncheon – Technology Expo
1:00 p.m. - 6:00 p.m. ANS Winter Meeting: Technical Sessions
1:30 p.m. - 3:30 p.m. TOFE Poster Session—I
3:50 p.m. - 6:05 p.m. TOFE: Technical Sessions

WEDNESDAY, NOVEMBER 12

8:15 a.m. - 9:50 a.m. TOFE Plenary Session—II
8:30 a.m. - 11:30 a.m. ANS Winter Meeting: Technical Sessions
10:20 a.m. - 12:30 p.m. TOFE: Technical Sessions
1:00 p.m. - 6:00 p.m. ANS Winter Meeting: Technical Sessions
1:30 p.m. - 3:30 p.m. TOFE Poster Session—II
4:00 p.m. - 6:00 p.m. TOFE: Technical Sessions
4:00 p.m. - 6:00 p.m. Focus on Communications Workshop

THURSDAY, NOVEMBER 13

8:00 a.m. - 10:05 a.m. TOFE Plenary Session—III
8:00 a.m. - 3:30 p.m. Technical Tour: Campus of the University of California–Irvine
8:30 a.m. - 11:30 a.m. ANS Winter Meeting: Technical Sessions
10:30 a.m. - 12:30 p.m. TOFE: Technical Sessions
1:30 p.m. - 6:00 p.m. TOFE: Technical Sessions

Registration

Meeting registration and the speakers' desk will be located in the Center Lounge of the Disneyland® Resort, Saturday - Thursday. Meeting registration is required for all attendees and presenters. Name badges are required for admission to all technical sessions and events.

Registration Hours:

Saturday
2 p.m. - 5 p.m.
Sunday
11 a.m. - 7 p.m.
Monday
7:30 a.m. - 5 p.m.
Tuesday
7:30 a.m. - 5 p.m.
Wednesday
7:30 a.m. - 5 p.m.
Thursday
7:30 a.m. - 2 p.m.

First-Time Attendee Orientation

The ANS Membership Committee will offer an orientation session for first-time ANS meeting attendees. Learn what goes on at national meetings, how the national organization works, and how to get involved at the national and local levels.

Whether you are a member or not, student or professional, if this is your first ANS national meeting, the Membership Committee invites you to attend this session, which will be held in Monorail A/B, in the Convention Center, at 1 - 1:30 p.m. on Sunday.

Student Program

Attendance at the 2014 ANS Winter Meeting is an exciting professional opportunity for college and graduate students. For information on the Student Program, see the Student Program Instructions document on the Winter Meeting web page. The Student Program Q&A Meeting will be held Sunday 4 - 5 p.m. in the Student Headquarters. The Student Headquarters is located in the North Exhibit Hall Room H.

Mentoring Program

A special mentoring program will be held from 5 - 6 p.m. on Sunday in the Monorail A/B Room.

ANS Members who 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.

Notice for Speakers

All speakers and session chairs must sign in at the Speakers' Desk located in the ANS Registration Area of the hotel during registration hours. The Speakers' Ready Room is located in North Exhibit Hall Room F.

ANS Member Business Center

Sunday - Thursday
8 a.m. - 5 p.m.
North Exhibit Hall
Room F

ANS Media Center

Monday
8 a.m. - 5 p.m.
Tuesday
8 a.m. - 5 p.m.
Wednesday
8 a.m. - 5 p.m.
North Exhibit Hall Room G

Spouse/Guest Hospitality

Spouse/guest hospitality breakfast will be served in the Mark Twain Room from 8 - 10 a.m., Monday through Wednesday. 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.

ANS Nuclear Technology Expo

The ANS Nuclear Technology Expo will be held in conjunction with the 2014 ANS Winter Meeting in the South Exhibit Hall of the Disneyland® Hotel Convention Center. Additional information can be found on page 67.

Expo hours are:
Sunday, 6 - 8 p.m.
Monday, 11:30 a.m. - 5 p.m.
Tuesday, 10 a.m. - 2 p.m.

Attendee Continental Breakfast

Monday - Thursday, 7 - 8 a.m., Center Lounge

Attendee Luncheons in the Expo

Monday - Tuesday, 11:30 a.m. - 1 p.m., South Exhibit Hall

Lunch on Monday and Tuesday in the Expo is included in the full meeting registration fee. The one day registration includes lunch on the day you are registered.

ANS Communications Seminar

Wednesday, in the Grand Ballroom

Focus on Communications
4 p.m. -6 p.m.
Complimentary beer, wine and light snacks provided.

Student Poster Session

Tuesday, 11 a.m. - 1 p.m.
Location: Exhibit Hall

Posters will be presented in the following categories:

Aerospace Nuclear Science and Technology:
Madicken Munk

Accelerator Applications:
Leo E. Kirsch
Amanda Lewis
Sanjay K. Sah

Fuel Cycle and Waste Management:
Remy R. Devoe

Fusion Energy:
Lucas M. Rolison

Human Factors, Instrumentation, and Controls:
Vivek Maradia

Isotopes and Radiation:
Taylor K. Lane
Ryan T. Pavlovsky
Mark A. Swanson

Materials Science and Technology:
Maxwell J. Daniels
Kieran P. Dolan
Kurt Harris
Paul M. Johns
Jonathan L. King
Jitesh A. Kuntawala
Laura K. Sudderth
Hi T. Vo

Mathematics and Computation:
Richard M. Vega

Nuclear Nonproliferation:
Oluwatomi Akindele
Jerrad P. Auxier
Emilie Fenske
Alexis C. Kaplan
Robert Weinmann-Smith

Operations and Power:
Trevor A. Bellon
Daniel J. Curtis

Thermal Hydraulics:
Landon Brockmeyer
Lane B. Carasik
Minghui Chen
Lambert H. Fick
Andrew Franklin
Natalie C. Galegar
Matthew E. Garza
Lakshana R. Huddar
Christopher Morrison

Co-op or Internship Experience and Results:
Andrew Conant
David H. Saucier

Student Outreach Activities:
Samantha P. Winkle

Best Practices for Student Sections:
Taylor R. Haby

ANS President's Reception

Sunday, 6 - 8 p.m., South Exhibit Hall

The ANS President's Reception is included in the full meeting registration fee. Tickets for guests are required at an additional fee.

Runners and Walkers: ANS Fun Run

On Tuesday, participate in a noncompetitive run starting at 6 a.m. from the lobby entrance of the hotel.

We hope you can join us. Bring shoes and a big smile.

Technical Tour: The Campus of the University of California – Irvine

Thursday, 8 a.m. - 3:30 p.m., departing from the Fantasy Tower lobby level, bus lane.

The tour will include the following facilities:
The UCI Nuclear Reactor is operated by the Department of Chemistry for use in radiochemistry applications. The reactor is a 250 kilowatt steady-state power Mark I TRIGA reactor built by General Atomics. Pulsing is possible to about 1000 megawatts. The reactor first became critical in November 1969. TRIGA reactors are water and zirconium hydride moderated to be especially safe for training and research purposes. Fuel is uranium enriched to less than 20% in U-235. The facility specializes in neutron activation analysis (NAA) using thermal and epi-thermal neutrons. It also provides a source of radioisotopes and radiation for testing of processes for separating lanthanides and actinides (10)– an important step for future recovery of partly used nuclear reactor fuel.

The UCI Keck-CCAMS facility was set up in 2002 with a $2M grant from the W. M.Keck Foundation and matching funds from UCI. The facility consists of three elements:

1. A compact AMS particle accelerator from National Electrostatics Corporation (NEC 0.5MV 1.5SDH-2 AMS system) for measuring radiocarbon.

2. A dedicated companion instrument (Finnegan Delta Plus stable isotope ratio mass spectrometer) for measuring carbon stable isotope ratios (13C/12C).

3. A new sample preparation laboratory to supplement existing UCI preparation labs to pre-treat, combust, hydrolyze and graphitize radiocarbon samples.

The goal of the National Fuel Cell Research Center is to facilitate and accelerate the development and deployment of fuel cell technology and fuel cell systems; promote strategic alliances to address the market challenges associated with the installation and integration of fuel cell systems; and to educate and develop resources for the various stakeholders in the fuel cell community.

Tickets can be purchased at the ANS Registration desk. The cost is $20.00.

60 YEARS
Dedicated to Professional Exchange and Public Service

American Nuclear Society Celebrating 60 Years.

Schedule at a Glance

Monday Schedule at a Glance		Location
7:30 a.m.-5:00 p.m.	**Meeting Registration**	Center Lounge
7:30 a.m.-9:30 a.m.	**Spouse/Guest Hospitality**	Mark Twain
8:00 a.m.-11:30 a.m.	**2014 ANS Winter Meeting Opening Plenary**	
	Nuclear: The Foundation of Clean Energy	Grand Ballroom
11:30 a.m.-1:00 p.m.	**Luncheon in Expo**	South Exhibit Hall
1:00 p.m.-4:00 p.m.	**2014 ANS Winter Meeting:Technical Sessions**	
	• Recent Nuclear Criticality Safety Program Technical Accomplishments	Grand Ballroom South A
	• Student Design Competition	Grand Ballroom South B
	• Domestic New Nuclear Construction–Panel	Grand Ballroom North A
	• Current Issues in Computational Methods–Roundtable: Reduced Models: Needs and Challenges	Grand Ballroom North B
	• General Thermal Hydraulics–I	Monorail A/B
	• Structural Materials and Used Nuclear Fuel Disposition	Monorail C
	• Experimental Support for System Code Development and Validation: IETs and SETs–Panel	Castle A/B
	• The Application of Systems Engineering in Complex System Safety Analysis for Small Modular Reactors–Panel	Castle C
	• Progress in U.S. DOE's Fuel Cycle Research and Development Program–Panel	Adventure
	• Thorium Fuel Cycle—Overview	Safari
	• Reactor Physics: General—I	Nile
	• Advances in Fast Reactor Designs and Concepts	Amazon
	• Radiation Protection and Shielding: General	Wilderness
	• International Safeguards for UF_6 Containers—Panel	Mississippi
4:00 p.m.-6:00 p.m.	**ANS President's Special Session**	Grand Ballroom

Tuesday Schedule at a Glance		Location
7:30 a.m.-5:00 p.m.	**Meeting Registration**	Center Lounge
7:30 a.m.-9:30 a.m.	**Spouse/Guest Hospitality**	Mark Twain
8:30 a.m.-11:30 a.m.	**2014 ANS Winter Meeting: Technical Sessions**	
	• Data, Analysis, and Operations for Nuclear Criticality Safety—I	Grand Ballroom South A
	• U.S. DOE NEUP-Sponsored Student Research	Grand Ballroom South B
	• Advanced/Gen-IV Reactors	Grand Ballroom North A
	• Transport Methods: General—I	Grand Ballroom North B
	• General Thermal Hydraulics—II	Monorail A/B

Tuesday Schedule at a Glance (continued)		Location
	• Advancements in Imaging, Nuclear Instrumentation and Measurement Technologies	Monorail C
	• U.S. Department of Energy Light Water Reactor Sustainability Program	Castle A/B
	• Combustible Gas Issues in Nuclear Safety–Panel	Castle C
	• Fuel Cycle Options Analysis–Papers/Panel—I	Adventure
	• Fuel Cycle Options Analysis—II	Adventure
	• Thorium Resources, Recovery, Fuels and Fuel Cycles	Safari
	• Reactor Physics: General—II	Nile
	• Reactor Physics Design, Validation and Operating Experience	Amazon
	• Making Ethics Real in Nuclear Engineering–Panel	Wilderness
	• Evolving Aspects of Decommissioning Commercial Power Reactors in the United States–Panel	Western
	• Cybersecurity: Protecting Our Digital Assets–Panel	Columbia
10:00 a.m.-12:00 p.m.	**2014 ANS Winter Meeting: Special Session**	
	• Global Seismic Safety Issues After the Fukushima Daiichi Accident: On Identification and Treatment of Uncertainty About Seismic Issues–Panel	Grand Ballroom
11:30 a.m.-1:00 p.m.	**Luncheon in Expo**	South Exhibit Hall
1:00 p.m.-4:00 p.m.	**2014 ANS Winter Meeting: Technical Sessions**	
	• Computational Methods: General—I	Grand Ballroom South A
	• Communicating the Benefits of Nuclear Energy in the Age of the Shale Gale–Panel	Grand Ballroom South B
	• Finding Common Ground with New Audiences–Panel	Grand Ballroom South B
	• New Nuclear Construction Around the World–Panel	Grand Ballroom North A
	• Nuclear Fuels	Grand Ballroom North B
	• Computational Thermal Hydraulics—I	Monorail A/B
	• Isotopes and Radiation: General	Monorail C
	• Experimental Thermal Hydraulics—I	Castle A/B
	• Current Topics in Probabilistic Risk Analysis	Castle C
	• Fuel Cycle Options Analysis—III	Adventure
	• Thorium Reactors	Safari
	• Reactor Physics: General—III	Nile
	• Physics and Engineering Analysis of Sub-Critical Driven Systems—I	Amazon
	• Computational Tools for Radiation Protection and Shielding	Wilderness
	• Industry Perspectives on the Decommissioning of Nuclear Facilities–Panel	Western

Tuesday Schedule at a Glance (continued)		Location
	• Human Factors, Instrumentation and Controls—Instrumention and Controls: General	Columbia
	• Nuclear Industry Role in Nonproliferation Initiatives–Panel	Mississippi
4:00 p.m.-6:00 p.m.	**2014 ANS Winter Meeting: Technical Sessions**	
	• Transport Methods: General—II	Grand Ballroom South A
	• Research by U.S. DOE CASL Students–Panel	Grand Ballroom South B
	• Computational Modeling and Corrosion in Nuclear Systems	Grand Ballroom North B
	• Thermal Hydraulics Analyst 2.1–Panel	Monorail A/B
	• Accelerator Applications: General	Monorail C
	• Experimental Thermal Hydraulics—II	Castle A/B
	• U.S. NRC Emergency Preparedness and Incident Response	Castle C
	• New Nuclear Data Formats and Processing Capabilities	Nile
	• Core Design Perspective on Accident Tolerant Fuels	Amazon
	• Radiation Protection and Shielding–Roundtable	Wilderness
	• Decommissioning and Environmental Sciences: General	Western
	• Human Factors, Instrumentation and Controls Division—Human Factors: General	Columbia
	• Deterministic Computational Methods for Radiation Transport and Dosimetry in Physics and Radiation Shielding	Mississippi
	• Factors Affecting Implementation of Industrial-Scale Used Fuel Recycle in the United States–Panel	Adventure
	• Nuclear Policy Discussion from ANS Congressional Fellows Perspectives	Grand Ballroom North A

Wednesday Schedule at a Glance		Location
7:30 a.m.-5:00 p.m.	**Meeting Registration**	Center Lounge
7:30 a.m.-9:30 a.m.	**Spouse/Guest Hospitality**	Mark Twain
8:30 a.m.-11:30 a.m.	**2014 ANS Winter Meeting: Technical Sessions**	
	• Data, Analysis, and Operations for Nuclear Criticality Safety—II	Grand Ballroom South A
	• The Innovations in Fuel Cycle Research Awards Program—A Student Competition	Grand Ballroom South B
	• Operations and Power: General	Grand Ballroom North A
	• Uncertainty Quantification and Sensitivity Analysis Methods	Grand Ballroom North B
	• Computational Thermal Hydraulics—II	Monorail A/B
	• Storage and Transportation of Used Nuclear Fuel—I	Monorail C
	• Experimental Thermal Hydraulics—III	Castle A/B
	• Nuclear Installations Safety: General—I	Castle C

Wednesday Schedule at a Glance (continued)		Location
	• Update on Status on Policy Issues in Waste Management–Panel	Adventure
	• Thorium Fuel Reprocessing and Waste Management	Safari
	• Reactor Physics Analysis Methods—I	Nile
	• Physics and Engineering Analysis of Sub-Critical Driven Systems—II	Amazon
	• Introduction to the SCALE/MAVRIC Shielding Tools–Tutorial	Wilderness
	• GEANT4–Tutorial—I	Western
	• Nuclear Plant Instrumentation and Control and Human-Machine 2015 (NPIC & HMIT)–Preview Session	Columbia
	• Nuclear Nonproliferation Technical Group: General—I	Mississippi
1:00 p.m.-4:00 p.m.	**2014 ANS Winter Meeting: Technical Sessions**	
	• Data, Analysis, and Operations for Nuclear Criticality Safety—III	Grand Ballroom South A
	• Education, Training, and Workforce Development: General	Grand Ballroom South B
	• Computational Methods: General—II	Grand Ballroom North B
	• Computational Thermal Hydraulics—III	Monorail A/B
	• Storage and Transportation of Used Nuclear Fuel—II	Monorail C
	• Young Professional Thermal Hydraulics Research Competition	Castel A/B
	• Nuclear Installations Safety: Containment Response and Severe Accidents	Castle C
	• Fuel Cycle and Waste Management: General—I	Adventure
	• Promising Thorium Fuel Cycles, Technology Gaps, and Identification of Data Needs to Support Them–Panel	Safari
	• Reactor Physics Analysis Methods—II	Nile
	• Physics of Compact Reactors for Terrestrial and Space Applications	Amazon
	• Aerospace Nuclear Science and Technology: General	Amazon
	• GEANT4–Tutorial—II	Western
	• Nuclear Nonproliferation Technical Group: General—II	Mississippi

Thursday Schedule at a Glance		Location
7:30 a.m.-2:00 p.m.	**Meeting Registration**	Center Lounge
8:00 a.m. - 3:30 p.m.	• Optional Technical Tour: Campus of the University of California–Irvine	Fantasy Tower Lobby Level, Bus Lane
8:30 a.m.-11:30 a.m.	• ANS Standards Forum	Grand Ballroom South A
	• Fuel Cycle and Waste Management: General—II	Adventure
	• Tutorial on Radiation Protection and Shielding in Aeronautics and Space Applications	Amazon

Monday TOFE Schedule at a Glance		Location
7:30 a.m.-5:00 p.m.	**Meeting Registration**	Center Lounge
1:30 p.m.-3:30 p.m.	**2014 TOFE: Technical Sessions**	
	• Major Facility Status: Stellarators	Magic Kingdom 3
	• Safety and Environmental Impact of Fusion	Magic Kingdom 4
3:50 p.m.-6:00 p.m.	**2014 TOFE: Technical Sessions**	
	• Major Facility Status: Tokamaks	Magic Kingdom 3
	• Materials Development and Modeling—I	Magic Kingdom 4

Tuesday TOFE Schedule at a Glance		Location
7:30 a.m.-5:00 p.m.	**Meeting Registration**	Center Lounge
8:00 a.m.-10:05 a.m.	**Plenary Session—I**	Magic Kingdom 3
10:30 a.m.-12:30 p.m.	**2014 TOFE: Technical Sessions**	
	• Perspectives on a Fusion Nuclear Science Facility—I	Magic Kingdom 3
	• Other MFE and IFE Technology	Magic Kingdom 4
1:30 p.m.-3:30 p.m.	**Poster Session—I**	Magic Kingdom 2
3:50 p.m.-6:05 p.m.	**2014 TOFE: Technical Sessions**	
	• Perspectives on a Fusion Nuclear Science Facility—II	Magic Kingdom 3
	• Extracting Fusion Power: Tritium and Gas Behavior	Magic Kingdom 4

Wednesday TOFE Schedule at a Glance		Location
7:30 a.m.-5:00 p.m.	**Meeting Registration**	Center Lounge
8:15 a.m.-10:05 a.m.	**Plenary Session—II**	Magic Kingdom 3
10:20 a.m.-12:30 p.m.	**2014 TOFE: Technical Sessions**	
	• ITER and Future Fusion Experiments—I	Magic Kingdom 3
	• DEMO and Power Plant Studies	Magic Kingdom 4
1:30 p.m.-3:30 p.m.	**Poster Session—II**	Magic Kingdom 2
4:00 p.m.-6:00 p.m.	**2014 TOFE: Technical Sessions**	
	• Divertors and PMI Challenge	Magic Kingdom 3
	• Blanket Development, Planning and Testing for ITER	Magic Kingdom 4

Thursday TOFE Schedule at a Glance		Location
7:30 a.m.-2:00 p.m.	**Meeting Registration**	Center Lounge
8:00 a.m.-10:05 a.m.	**Plenary Session—III**	Magic Kingdom 3
10:30 a.m.-12:30 p.m.	**2014 TOFE: Technical Sessions**	
	• ITER and Future Fusion Experiments—II	Magic Kingdom 3
	• Materials Test Facilities	Magic Kingdom 2
1:30 p.m.-3:30 p.m.	**2014 TOFE: Technical Sessions**	
	• Divertors and High Heat Flux Components	Magic Kingdom 3
	• Fuel Cycle and Breeding	Magic Kingdom 2
4:00 p.m.-6:10 p.m.	**2014 TOFE: Technical Sessions**	
	• Addressing the PMI Challenge	Magic Kingdom 3
	• Materials Development and Modeling—II	Magic Kingdom 2

(Asterisks indicate special sessions.)

Special Sessions

*Opening Plenary: Nuclear: The Foundation of Clean Energy, Mon. a.m.
*ANS President's Special Session, Mon. p.m.
*Special Session: Global Seismic Safety Issues After the Fukushima Daiichi Accident, On Identification and Treatment of Uncertainty about Seismic Issues,Tues. a.m.

Accelerator Applications (AAD)

(Physics and Engineering Analysis of Sub-Critical Driven Systems—I), Tues p.m.
Accelerator Applications: General, Tues. p.m.
(Physics and Engineering Analysis of Sub-Critical Driven Systems—II), Wed. a.m.

Aerospace Nuclear Science and Technology (ANSTD)

(Physics of Compact Reactors for Terrestrial and Space Applications), Wed. p.m.
Aerospace Nuclear Science and Technology: General, Wed. p.m.
(Tutorial on Radiation Protection and Shielding in Aeronautics and Space Applications), Thurs. a.m.

Biology and Medicine (BMD)

(Deterministic Computational Methods for Radiation Transport and Dosimetry in Physics and Radiation Shielding), Tues. p.m.
GEANT4–Tutorial—I, Wed. a.m.
GEANT4–Tutorial—II, Wed. p.m.

Decommissioning and Environmental Sciences (DESD)

Evolving Aspects of Decommissioning Commercial Power Reactors in the United States–Panel, Tues. a.m.
Industry Perspectives on the Decommissioning of Nuclear Facilities–Panel, Tues. p.m.
Decommissioning and Environmental Sciences: General, Tues. p.m.

Education, Training, and Workforce Development (ETWDD)

Student Design Competition, Mon. p.m.
U.S. DOE NEUP-Sponsored Student Research, Tues. p.m.
Cybersecurity: Protecting Our Digital Assets–Panel, Tues. a.m.
Communicating the Benefits of Nuclear Energy in the Age of the Shale Gale–Panel, Tues. p.m.
Finding Common Ground with New Audiences–Panel, Tues. p.m.
Research by U.S. DOE CASL Students–Panel, Tues. p.m.
The Innovations in Fuel Cycle Research Awards Program—A Student Competition, Wed. a.m.
Education, Training, and Workforce Development: General, Wed. p.m.

Fuel Cycle and Waste Management (FCWMD)

Progress in U.S. DOE's Fuel Cycle Research and Development Program–Panel, Mon. p.m.
Thorium Fuel Cycle—Overview, Mon. p.m.
(Advances in Fast Reactor Designs and Concepts), Mon. p.m.
(International Safeguards for UF_6 Containers), Mon. p.m.
Fuel Cycle Options Analysis–Papers/Panel—I, Tues. a.m.
Fuel Cycle Options Analysis—II, Tues. a.m.
Fuel Cycle Options Analysis—III, Tues p.m.
Thorium Resources, Recovery, Fuels and Fuel Cycles, Tues a.m.
Thorium Reactors, Tues. p.m.
(Physics and Engineering Analysis of Sub-Critical Driven Systems—I), Tues. p.m.
Factors Affecting Implementation of Industrial-Scale Used Fuel Recycle in the United States–Panel, Tues. p.m.
Storage and Transportation of Used Nuclear Fuel—I, Wed. a.m.
Storage and Transportation of Used Nuclear Fuel—II, Wed. p.m.
Update on Status on Policy Issues in Waste Management–Panel, Wed. a.m.
Thorium Fuel Reprocessing and Waste Management, Wed. a.m.
(Physics and Engineering Analysis of Sub-Critical Driven Systems—II), Wed. a.m.
Fuel Cycle and Waste Management: General—I, Wed. p.m.
Fuel Cycle and Waste Management: General—II, Thurs. a.m.
Promising Thorium Fuel Cycles, Technology Gaps, and Identification of Data Needs to Support Them–Panel, Wed. p.m.

Fusion Energy (FED)

U.S. Department of Energy Light Water Reactor Sustainability Program, Tues. a.m.
(Physics and Engineering Analysis of Sub-Critical Driven Systems—I), Tues. p.m.
(Physics and Engineering Analysis of Sub-Critical Driven Systems—II), Wed. a.m.

Human Factors, Instrumentation, and Controls (HFICD)

Human Factors, Instrumentation and Controls—Instrumention and Controls: General, Tues. p.m.
Human Factors, Instrumentation and Controls Division—Human Factors: General, Tues. p.m.
Nuclear Plant Instrumentation and Control and Human-Machine 2015 (NPIC & HMIT)–Preview Session, Wed. a.m.

Isotope and Radiation (IRD)

Advancements in Imaging, Nuclear Instrumentation and Measurement Technologies, Tues. a.m.
Isotopes and Radiation: General, Tues. p.m.
(Nuclear Nonproliferation Technical Group: General—II), Wed. a.m.

Materials Science and Technology (MSTD)

Structural Materials and Used Nuclear Fuel Disposition, Mon. p.m.
Nuclear Fuels, Tues. p.m.
Computational Modeling and Corrosion in Nuclear Systems, Tues. p.m.

Mathematics and Computation (MCD)

Current Issues in Computational Methods–Roundtable, Mon. p.m.
Transport Methods: General—I, Tues. a.m.
Transport Methods: General—II, Tues. p.m.
Computational Methods: General—I, Tues. p.m.

Computational Methods: General—II, Wed. p.m.
(Deterministic Computational Methods for Radiation Transport and Dosimetry in Physics and Radiation Shielding), Tues. p.m.
Uncertainty Quantification and Sensitivity Analysis Methods, Wed. a.m.
(GEANT4–Tutorial—I), Wed. a.m.
(GEANT4–Tutorial—II), Wed. p.m.

Nuclear Criticality Safety (NCSD)

Recent Nuclear Criticality Safety Program Technical Accomplishments, Mon. p.m.
Data, Analysis, and Operations for Nuclear Criticality Safety—I, Tues. a.m.
Data, Analysis, and Operations for Nuclear Criticality Safety—II, Wed. a.m.
Data, Analysis, and Operations for Nuclear Criticality Safety—III, Wed. p.m.
(New Nuclear Data Formats and Processing Capabilities), Tues. p.m.
ANS Standards Forum, Thurs. a.m.

Nuclear Installations Safety (NISD)

The Application of Systems Engineering in Complex System Safety Analysis for Small Modular Reactors–Panel, Mon. p.m.
Combustible Gas Issues in Nuclear Safety–Panel, Tues. a.m.
Current Topics in Probabilistic Risk Analysis, Tues. p.m.
U.S. NRC Emergency Preparedness and Incident Response, Tues. p.m.
Nuclear Installations Safety: General, Wed. a.m.
(Nuclear Nonproliferation Technical Group: General—II), Wed. a.m.
Nuclear Installations Safety: Containment Response and Severe Accidents, Wed. p.m.

Nuclear Nonproliferation Technical Group (NNTG)

International Safeguards for UF_6 Containers, Mon. p.m.
Nuclear Industry Role in Nonproliferation Initiatives–Panel, Tues. p.m.
Nuclear Nonproliferation Technical Group: General—I, Wed. a.m.
Nuclear Nonproliferation Technical Group: General—II, Wed. p.m.

Operations and Power (OPD)

Domestic New Nuclear Construction–Panel, Mon. p.m.
Advanced/Gen-IV Reactors, Tues. a.m.
New Nuclear Construction Around the World–Panel, Tues. p.m.
Operations and Power: General, Wed. a.m.

Radiation Protection and Shielding (RPSD)

Radiation Protection and Shielding: General, Mon. p.m.
Making Ethics Real in Nuclear Engineering–Panel, Tues. a.m.
Computational Tools for Radiation Protection and Shielding, Tues. p.m.
Radiation Protection and Shielding–Roundtable, Tues. p.m.
(Deterministic Computational Methods for Radiation Transport and Dosimetry in Physics and Radiation Shielding), Tues. p.m.
Introduction to the SCALE/MAVRIC Shielding Tools–Tutorial, Wed. a.m.
(GEANT4–Tutorial—I), Wed. a.m.
(Nuclear Nonproliferation Technical Group: General—II), Wed. a.m.
(GEANT4–Tutorial—II), Wed. p.m.
(Tutorial on Radiation Protection and Shielding in Aeronautics and Space Applications), Thurs. a.m.

Reactor Physics (RPD)

Reactor Physics: General—I, Mon. p.m.
Reactor Physics: General—II, Tues. a.m.
Reactor Physics: General—III, Tues. p.m.
Advances in Fast Reactor Designs and Concepts, Mon. p.m.
Reactor Physics Design, Validation and Operating Experience, Tues. a.m.
(Thorium Reactors), Tues. p.m.
Physics and Engineering Analysis of Sub-Critical Driven Systems—I, Tues. p.m.
Physics and Engineering Analysis of Sub-Critical Driven Systems—II, Wed. a.m.
New Nuclear Data Formats and Processing Capabilities, Tues. p.m.
Core Design Perspective on Accident Tolerant Fuels, Tues. p.m.
Reactor Physics Analysis Methods—I, Wed. a.m.
Reactor Physics Analysis Methods—II, Wed. p.m.
Physics of Compact Reactors for Terrestrial and Space Applications, Wed. p.m.
Tutorial on Radiation Protection and Shielding in Aeronautics and Space Applications, Thurs. a.m.

Thermal Hydraulics (THD)

General Thermal Hydraulics–I, Mon. p.m.
General Thermal Hydraulics—II, Tues. a.m.
Experimental Support for System Code Development and Validation: IETs and SETs–Panel, Mon. p.m.
Computational Thermal Hydraulics—I, Tues. p.m.
Computational Thermal Hydraulics—II, Wed. a.m.
Computational Thermal Hydraulics—III, Wed. p.m.
Experimental Thermal Hydraulics—I, Tues. p.m.
Experimental Thermal Hydraulics—II, Tues. p.m.
Experimental Thermal Hydraulics—III, Wed. a.m.
Thermal Hydraulics Analyst 2.1–Panel, Tues. p.m.
Young Professional Thermal Hydraulics Research Competition, Wed. p.m.

Young Members Group (YMG)

Nuclear Policy Discussion from ANS Congressional Fellows Perspectives, Tues. p.m.
(Nuclear Nonproliferation Technical Group: General—II), Wed. a.m.
(Young Professional Thermal Hydraulics Research Competition), Wed. p.m.

Computation Medical Physics Working Group (CMPWG)

Deterministic Computational Methods for Radiation Transport and Dosimetry in Physics and Radiation Shielding, Tues. p.m.
(GEANT4–Tutorial—I), Wed. a.m.
(GEANT4–Tutorial—II), Wed. p.m.

Opening Plenary: Nuclear: The Foundation of Clean Energy

Chair: Edward Halpin *(PG&E)*

8 a.m. - Grand Ballroom

Welcome and Honors and Awards Presentation

Dr. Michaele (Mikey) Brady Raap *(President, ANS; Chief Engineer, Pacific Northwest National Laboratory)*

Speakers

- Edward Halpin *(Sr. Vice President and Chief Nuclear Officer of Pacific Gas and Electric Company)*
- Commissioner William Ostendorff *(Nuclear Regulatory Commission)*
- Jessica Lovering *(The Breakthrough Institute)*
- Bob Willard *(CEO for the Institute of Nuclear Power Operations)*

Recent Nuclear Criticality Safety Program Technical Accomplishments

Sponsored by NCSD

Session Organizer: Nichole Ellis *(Ellis Engineering LLC)*

Cochairs: Nichole Ellis *(NCSP),* Lori Scott *(NCSP)*

Grand Ballroom, South A

1:00 p.m.

Steady State Neutron and Gamma Measurements of the Godiva Reactor, David P. Hickman, Jennifer G. Burch, Rebecca R. Hudson, Gary W. Slavik, Scott Richardson, John Scorby, Radoslav Radev, Nathaniel Bowden, David P. Heinrichs *(LLNL),* Joetta Goda, John Bounds, Tom Mclean, Jesson Hutchison, Travis Grove *(LANL),* Dann C. Ward *(SNL),* Chris Wilson, Leo Clark *(Atomic Weapons Establishment)*

1:25 p.m.

ORNL Nuclear Data Evaluation Accomplishment for FY 2013, L. Leal, V. Sobes, M. Pigni, K. Guber, G. Arbanas, D. Wiarda, M. Dunn *(ORNL),* E. Ivanov, T. Ivanova, E. Letang *(Institut de Radioprotection et de Surete Nucleaire)*

1:50 p.m.

Nuclear Data Advisory Group Technical Support for the U.S. Nuclear Criticality Safety Program, Michael E. Dunn *(ORNL)*

2:15 p.m.

Godiva IV Startup at National Criticality Experiments Research Center (NCERC): Delayed Critical Through Prompt Critical, J. Goda, J. Bounds, D. Hayes, R. Sanchez *(LANL)*

2:40 p.m.

MCNP Sensitivity/Uncertainty Accomplishments for the Nuclear Criticality Safety Program, Brian C. Kiedrowski, Forrest B. Brown, Jeffrey S. Bull, Albert C. Kahler, D. Kent Parsons *(LANL),* Matthew A. Gonzales, Anil K. Prinja *(Univ of New Mexico)*

3:05 p.m.

Management Perspective on Recent Accomplishments and Future Plans for NCERC, Steven D. Clement, William L. Myers *(LANL),* Jerry N. McKamy *(National Nuclear Security Administration),* Nichole Ellis *(Ellis Engineering LLC)*

3:30 p.m.

A Review of Recent R&D Efforts in Sub-Critical Multiplication Measurements and Simulations, Avneet Sood, C. J. Solomon, J. D. Hutchinson, Rian Bahran *(LANL)*

Student Design Competition

Sponsored by ETWDD

Session Organizer and Chair: Travis W. Knight *(Univ of South Carolina)*

Grand Ballroom, South B

Undergraduate Category

1:00 p.m.

Method to Enhance Spent Fuel Pool and Dry Cask Storage, Dustin Giltnane, David Gotthold, Seth Langford, Michael Ratliff, Jessica Shewmaker, Cody Wiggins *(Univ of Tennessee-Knoxville)*

1:30 p.m.

Core Design Analysis of the Molybdenum-99 Pool Reactor (MoPR), J. Hader, J. Klimes, J. Marshall, F. Odeh, M. Polek, S. Rafferty *(Purdue Univ)*

2:00 p.m.

Water-Based Neutron Scintillator Detector Design, Construction, and Testing, Andrew Grice, Kam YuLee, Jessica Maddocks, Gregory Peacock, Kevin Reeves *(Georgia Tech)*

Graduate

2:30 p.m.

Load Following Molten Salt Reactor, William Cook, Jinyong Feng, Lloyd Price *(TAMU)*

Domestic New Nuclear Construction–Panel

Sponsored by OPD

Session Organizer and Chair: Chad J. Boyer *(The Shaw Group, Inc.)*

Grand Ballroom, North A

1:00 p.m.

Despite the setbacks due to the recession and Fukushima, the U.S. Nuclear Renaissance continues with the construction of five units Watts Bar 2, Vogtle 3 & 4 and VC Summer 2 & 3. While one project is significantly different than the other two, they all face similar challenges in areas such as staffing, procurement, and regulatory issues. This panel will provide updates on the projects, lessons learned, and a discussion of challenges going forward.

Panelists:

- Vogtle 3&4 and VC Summer 2&3 Project Update, Brian Hobbs *(CB &I)*
- Operational Readiness for a Vogtle 3&4, Jeff Gasser *(Southern Nuclear)*
- AP1000 Supply Chain, George Shampy *(CB&I)*
- Issues facing the Next Reactor Order, Jeffry Simmons *(Toshiba America Nuclear Energy)*

Current Issues in Computational Methods–Roundtable: Reduced Models: Needs and Challenges

Sponsored by MCD
Session Organizer and Chair: Tunc Aldemir *(Ohio State)*

Grand Ballroom, North B

1:00 p.m.

With the recent best estimate plus uncertainty (BEPU) approach to reactor safety which also allows quantification of safety margins, it has become necessary to run a large number of parametric studies for the adequate coverage of the uncertainty space with adequate confidence. Performing these parametric studies through legacy codes such as RELAP and MELCOR can require hundreds of days of run times. Recently, there have been efforts to develop approaches for the generation of surrogate fast running models that will allow the completion of such parametric studies in a feasible amount of time. The objective of the roundtable is the review of the state of the art in the generation of these surrogate models and remaining challenges.

Panelists

- Tunc Aldemir *(Ohio State Univ)*
- Hany Abdel-Khalik *(Purdue Univ)*
- Cristian Rabiti *(INL)*
- Robert P. Martin *(Babcock & Wilcox)*
- Rodney Schmidt *(SNL)*

General Thermal Hydraulics—I

Sponsored by THD
Session Organizer: John C. Luxat *(McMaster Univ)*
Cochairs: John C. Luxat *(McMaster Univ),* Xiaodong Sun *(Ohio State Univ)*

Monorail A/B

1:00 p.m.

Thermal-Hydraulic Core Design Concept of an Accelerator-Driven Minor Actinide Burner, Adam Kraus, Elia Merzari, Yan Cao, Yousry Gohar *(ANL)*

1:25 p.m.

A Mechanistic Vertical Low Flow Critical Heat Flux Correlation, Jeffrey M. Luitjens, Qiao Wu *(Oregon State Univ)*

1:50 p.m.

Validation Data: Managing the Weak Link, Nam Dinh *(NCSU),* Weiju Ren *(ORNL),* Hyung Lee *(BAPL)*

2:15 p.m.

Benchmark data for CFD Validation using 2D-PIV in Turbulent Parallel Planar Jets, Elvis Dominguez-Ontiveros, Hristo Goumnerov, Yassin Hassan *(TAMU)*

2:40 p.m.

Sensitivity Analysis of Fukushima Daiichi Unit 1 Type Accident with MELCOR, Gen Li *(Waseda Univ),* Yoshiaki Oka *(Univ of Tokyo)*

3:05 p.m.

Tank Mixing Study with Flow Recirculation, Si Y. Lee *(SRNL)*

3:30 p.m.

Thermal-Hydraulically Optimal Power Profile for a Nuclear Thermal Rocket Engine, Peter J. A. Husemeyer *(Univ of Cambridge, Center for Space Nuclear Research)*

3:55 p.m.

Preliminary Design of a Helical Coil Heat Exchanger for a Fluoride Salt-Cooled High-Temperature Test Reactor, M. Chen, I. Kim, X. Sun, R. N. Christensen *(Ohio State Univ),* I. Skavdahl, V. Utgikar *(Univ of Idaho),* P. Sabharwall *(INL)*

Structural Materials and Used Nuclear Fuel Disposition

Sponsored by MSTD
Session Organizer: Kenneth J. Geelhood *(PNNL)*
Chair: Micah J. Hackett *(TerraPower, LLC)*

Monorail C

1:00 p.m.

Microstructure and Mechanical Behavior of Neutron Irradiated Ultrafine Grained Ferritic Steel, Ahmad Alsabbagh, Apu Sarkar *(NCSU),* Brandon Miller *(INL),* Jatuporn Burns *(CAES),* Leah Squires, Douglas Porter, James I. Cole *(INL),* K. L. Murty *(NCSU)*

1:25 p.m.

The Used Nuclear Fuel Problem in the USA – Consolidated Storage and Standardized Storage Canisters, Chris Phillips, Ivan Thomas, Steven McNiven *(EnergySolutions)*

1:50 p.m.

Sensitivity Studies on UNF Cladding Structural Integrity Under NCT Loading, Scott E. Sanborn, Brian J. Koeppel, Ken J. Geelhood, Harold E. Adkins *(PNNL)*

2:15 p.m.

Polytypic Stabilization of Nanostructured Polymer Derived SiC for Nuclear Applications, Shelly Arreguin *(Univ of Washington, PNNL),* Rajendra K. Bordia *(Clemson Univ),* Charles H. Henager, Jr. *(PNNL)*

2:40 p.m.

Effects of Charged Particle Irradiations in Reactor Pressure Vessel Steels, N. Almirall, P. Wells, T. Yamamoto,G. R. Odette *(Univ of California, Santa Barbara)*

3:05 p.m.

Low-Temperature Chemical Vapor Deposition of Vanadium Carbide for Mitigating the FCCI, Wei-Tang Lo, Shaosong Huang, Nils Strombom, Yong Yang *(Univ of Florida)*

3:30 p.m.

Formation of Molten Fluoride Salt Corrosion Resistant Coatings on Nickel-Based Alloys, M. C. Brupbacher, D. Zhang, W. M. Buchta, J. B. Spicer, D. C. Nagle *(Johns Hopkins Univ)*

Experimental Support for System Code Development and Validation: IETs and SETs–Panel

Sponsored by THD
Session Organizers and Cochairs: Wade R. Marcum *(Oregon State Univ),* David L. Aumiller *(BAPL)*

Castle A/B

1:00 p.m.

This session is intended to be composed of a panel of experts who have direct experience designing, fabricating, and/or utilizing integral effects tests (IETs) and/or separate effects tests (SETs) facilities for the purpose of system code verification and validation. Five objectives of this session are identified: (1) to acknowledge the existing experience of experts within the field of experimental thermal hydraulics who have directly or indirectly provided experimental data to support codes utilized within a regulatory environment, (2) to identify the capabilities of existing facilities that have been utilized within a regulatory environment, (3) to provide a description of how the existing data sources have been used for safety code validation, (4) to discuss the integration and future use of such facilities within the nuclear industry, and (5) to acknowledge gaps within the experimental infrastructure that may be of relevance within the current and future direction of the nuclear industry.

Panelists:

- Steve Bajorek *(NRC)*
- Paul Bayless *(INL)*
- Robert (Bob) Martin *(B&W mPower)*
- David Aumiller *(Bettis)*
- Victor Ransom *(Purdue Univ)*
- Cesare Frepoli *(Fpolisolutions)*
- Chul-Hwa Song *(KAERI)*

The Application of Systems Engineering in Complex System Safety Analysis for Small Modular Reactors–Panel

Sponsored by NISD
Session Organizer and Chair: Kent B. Welter *(NuScale Power Inc)*

Castle C

1:00 p.m.

This panel of experts will discuss the growing body of knowledge and technology focused on complex system safety analysis as applied to small modular reactors. The need for an interdisciplinary risk-informed performance-based approach for designing, licensing, constructing, and operating safe nuclear power plants will be explored.

Panelists:

- Ben Amaba *(IBM)*
- Kristiina Soderholm *(Fortum)*
- Irem Tumer *(Oregon State Univ)*
- Kent Welter *(NuScale Power Inc)*

Progress in DOE's Fuel Cycle Research and Development Program–Panel

Sponsored by FCWMD
Session Organizer: Andrew R. Griffith *(DOE)*
Chair: Patricia D. Paviet *(DOE)*

Adventure

1:00 p.m.

The objective of this session is to disseminate information and stimulate discussion regarding recent research and development (R&D) progress in the U.S. Department of Energy's (DOE's) Fuel Cycle Research and Development (FCR&D) program. The session will consist of technical presentations provided by researchers in several technical areas of the FCR&D program. Talks will cover a broad range of subjects, including but not limited to: separation technologies, waste form development, innovative fuels, systems analysis, used fuel disposition, material protection and control, and modeling/simulation.

Panelists:

- Patricia Paviet *(DOE-NE)*
- Sam Durbin *(SNL)*
- Bo Feng *(ANL)*
- Leigh Martin *(INL)*
- Jarrod Crum *(PNNL)*
- Cindi Papesch *(INL)*
- Jack Galloway *(LANL)*
- David Enos *(SNL)*

Thorium Fuel Cycle—Overview

Sponsored by FCWMD
Session Organizer: Steven L. Krahn *(Vanderbilt Univ)*
Chair: Andrew Worrall *(ORNL)*

Safari

1:00 p.m.

The Context, Structure, and Objectives of the Thorium Fuel Cycle Technical Track, Steven Krahn *(Vanderbilt Univ),* Andrew Worrall *(ORNL),* Allen Croff, Timothy Ault, Bethany Smith *(Vanderbilt Univ)*

1:25 p.m.

Thorium Fuel Cycle Option Screening and Path Forward in the U.S., Temitope A. Taiwo, Taek. K. Kim *(ANL),* Roald A. Wigeland *(INL)*

1:50 p.m.

Technical Aspects of Thorium Use in Nuclear Reactors, Michael Todosow *(BNL)*

2:15 p.m.

OECD NEA Review Activities on the Introduction of Thorium in the Nuclear Fuel Cycle, F. Michel-Sendis, S. Cornet, J. Gulliford *(OECD)*

2:40 p.m.

Thorium Research Interested in the UK, K. W. Hesketh *(UK Natl Nucl Lab)*

3:05 p.m.
An Overview of the Thorium Program Plan of the Chinese Academy of Sciences, Hongjie Xu, Zhimin Dai, Xiangzhou Cai *(Chinese Academy of Sciences)*

3:30 p.m.
Overview of the Thor Energy Thorium Fuel Development Program, Saleem S. Drera, Julian F. Kelly, Øystein Asphjell, Klara Insulander Björk *(Thor Energy)*

Reactor Physics: General—I

Sponsored by RPD
Session Organizer: Alexander Stanculescu *(INL)*
Chair: Massimiliano Fratoni *(Univ of California, Berkeley)*

Nile

1:00 p.m.
Assessment of an On-Line Reactivity Monitoring Technique, Dominic Caron, Sandra Dulla, Marta Nervo, Piero Ravetto *(Politecnico di Torino),* Mario Carta *(ENEA C.R. CASACCIA)*

1:25 p.m.
Neutron Deterministic Models of the EBR-II HRT-45R Core Configuration, Marco Marchetti, Barbara Vezzoni, Fabrizio Gabrielli, Andrei Rineiski *(KIT)*

1:50 p.m.
Thermal Nuclear Reactor Control by Moderator Displacement with Negative Feedback, Neal L. Mann *(Consultant)*

2:15 p.m.
Fully Ceramic Microencapsulated Fuel in FHRs: A Preliminary Reactor Physics Assessment, Jeffrey J. Powers *(ORNL)*

2:40 p.m.
Reduction of Spatial and Spectral Effects by Adjoint Weighing of Flux Signals in a Reactivity Reconstruction Technique, Sandra Dulla, Siew Sin Hoh, Marta Nervo, Piero Ravetto *(Politecnico di Torino)*

3:05 p.m.
Statistical Error Estimation Using Bootstrap Method for the Feynman-alpha Method, Tomohiro Endo, Takeshi Shizawa, Akio Yamamoto *(Nagoya Univ),* Cheol Ho Pyeon, Takahiro Yagi *(Kyoto Univ)*

3:30 p.m.
Application of the Big T Burnable Absorber to AP1000 Core for a Soluble Boron Free Operation, Mohd-Syukri Yahya, Yonghee Kim *(KAIST)*

Advances in Fast Reactor Designs and Concepts

Sponsored by RPD; cosponsored by FCWMD
Session Organizer: Florent Heidet *(ANL)*
Chair: Yonghee Kim *(KAIST)*

Amazon

1:00 p.m.
EBR-II Passive Safety Demonstration Tests Benchmark Analyses – Phase 1, L. L. Briggs, T. Sumner, T. Fei, T. Sofu *(ANL),* S. Monti *(IAEA)*

1:25 p.m.
On Multi-Group Cross Sections for Breed-and-Burn Reactors, Jason Hou *(Univ of California-Berkeley),* Florent Heidet *(ANL),* Phillip Gorman, Ehud Greenspan *(Univ of California-Berkeley)*

1:50 p.m.
Calculation of Photon Heat Generation for EBR-II Using DIF3D/MC2-3, T. Fei, C. H. Lee, T. K. Kim, T. Sofu *(ANL)*

2:15 p.m.
3D Shuffling in Breed and Burn Reactors, Staffan Qvist *(Uppsala Univ),* Ehud Greenspan *(Univ of California-Berkeley)*

2:40 p.m.
Maximum Burnup of Breed and Burn Reactors with Limited Separation Processes, Christian D. Di Sanzo, Ehud Greenspan, Jasmina L. Vujic *(Univ of California-Berkeley)*

3:05 p.m.
An Investigation on the Homogenization of Fast Reactor Fuel Assembly, Woong Heo, Yonghee Kim *(KAIST)*

Radiation Protection and Shielding: General

Sponsored by RPSD
Session Organizer: Peter F. Caracappa *(RPI)*
Chair: Ashby H. Bridges *(URENCO USA)*

Wilderness

1:00 p.m.

Polymer Nanocomposite Based Neutron Shielding Materials for Spent Nuclear Fuel Management, Jaewoo Kim *(KAERI),* Young-Soo Seo *(Sejong Univ),* Jeseung Yoo *(KAERI, Sejong Univ),* William H. Miller *(Univ of Missouri, Columbia)*

1:25 p.m.

A Gamma Dose Rate Estimation Model for Radioactive Waste Containers, Maritza R. Gaul *(CDTN),* Massimo Zucchetti *(DENERG)*

1:50 p.m.

Light Transport in Thin Polymeric Detectors with GEANT4 for Radiation Portal Monitors, M. J. Urffer, L. F. Miller *(Univ of Tennessee-Knoxville)*

2:15 p.m.

MCNP6 Enhancements to Alpha Particle Production and Transport, G. E. McMath, G. W. McKinney *(LANL)*

2:40 p.m.

Function of XRCC4 C-Terminal Region in DNA Double-Strand Break Repair, Rujira Wanotayan, Mukesh Kumar Sharma, Yoshihisa Matsumoto *(Tokyo Inst. of Technology)*

International Safeguards for UF_6 Containers–Panel

Sponsored by NNTG; cosponsored by FCWMD, RPSD, IRD
Session Organizer: Rian M. Bahran *(LANL)*
Chair: Alicia L. Swift *(Univ of Tennessee)*

Mississippi

1:00 p.m.

Thousands of cylinders containing uranium hexafluoride (UF_6) move around every day. Each of these large cylinders can contain close to a significant quantity of low-enriched uranium, their contents could be very useful to a country intent on diverting uranium for clandestine use. A report investigating current international methods for detecting diversion and undeclared use of UF_6 cylinders highlighted that the current international detection goal of an SQ within 1 year is too long and that there are limited capabilities of detecting the use of undeclared cylinders. This panel will discuss advances intended to address these issues.

Panelists

- Faranak Nekoogar *(LANL)*
- Chris Pickett *(ORNL)*
- Jessica White-Horton *(ORNL)*

ANS President's Special Session

"Beyond 60: Challenges for the Next Generation Nuclear Professional"

Session Organizer:
Dr. Michaele (Mikey) Brady Raap
(President, ANS; Chief Engineer, Pacific Northwest National Laboratory)

Grand Ballroom • 4:00 p.m.

ANS leaders provide a glimpse into the challenges and opportunities facing the next generation of nuclear science and technology professionals as they address the future of global leadership, public policies, public engagement, industry/corporate engagement and professional engagement.

Speakers:

- Dr. Michaele Brady Raap and Dr. David Pointer *(Technical Lead, Oak Ridge National Laboratory)*: Global leadership and public engagement
- Dr. A. David Rossin *(ANS President 1992-93):* Impacting policy by understanding science
- Gale Hauck *(Principal Quality Engineer, Westinghouse):* Professional engagement
- Carol Berrigan *(Senior Director, Supplier and Workforce Policy, Nuclear Energy Institute):* Industry/Corporate engagement

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

Sponsored by NCSD
Session Organizer: Allison D. Miller *(SNL)*
Chair: Larry L. Wetzel *(Babcock & Wilcox)*

Grand Ballroom, South A

8:30 a.m.
List-Mode Simulations of the Subcritical Thor Core Benchmark Sensitivity Experiments, R. Bahran, J. Hutchinson, B. Richard, Avneet Sood *(LANL)*

8:55 a.m.
Artificial Neural Network Representation of Criticality Excursion Experiment Data, Peter L. Angelo *(Y-12 NSC)*

9:20 a.m.
Challenges Associated with the Current Demand for UK Criticality Safety Assessors, Ben Webborn *(UK Nuclear National Lab)*

9:45 a.m.
Nuclear Criticality Evaluation for Vitrified Borosilicate Glass, Glenn A. Christenbury *(DOE)*

10:10 a.m.
Generation of Thermal Scattering Laws for YH_2 using Ab Initio Methods, Michael L. Zerkle *(BAPL)*

10:35 a.m.
Reevaluation of Room Return Corrections for Two ORCEFHEU-Metal-Cylinder Benchmark Evaluations, John D. Bess *(INL)*

11:00 a.m.
Benchmark Specifications and Results for α and Λ ina HEU Metal System Using ORSphere, Margaret A. Marshall, John D. Bess *(INL)*

U.S. DOE NEUP-Sponsored Student Research

Sponsored by ETWDD
Session Organizer: Gregory A. Bala *(INL)*
Chair: Jenna Payne *(Battelle Energy Alliance)*

Grand Ballroom, South B

8:30 a.m.
Simulation of Radiation Re-solution in Uranium Carbide, Christopher Matthews, Andrew Klein *(Oregon State Univ)*

8:55 a.m.
Multi-State Physics Based Aging Assessment of PWR Steam Generator Tubes Rupture in Case of Primary Water Stress Corrosion Cracking, Askin Guler, Tunc Aldemir, Richard Denning *(Ohio State Univ)*

9:20 a.m.
System for Testing Thermal Shock in Printed Circuit Heat Exchangers, Ian Jentz, Ben Marzouk, Mark Anderson *(Univ of Wisconsin-Madison)*, Xiaodong Sun *(Ohio State Univ)*

9:45 a.m.
Using Multi-Criteria Decision Analysis (MCDA) and the Analytic Hierarchy Process (AHP) for the Selection of a Nuclear Fuel Cycle in the United States Including Public Perceptions, John Swanson, Ishoc Salaam, Sama Bilbao y León *(VCU)*

10:10 a.m.
Experimental Design and Flow Visualization for the Upper Plenum of a Scaled VHTR, Kyle L. McVay, Jae Hyung Park, Saya Lee, Yassin A. Hassan, N. K. Anand *(TAMU)*

10:35 a.m.
Small Modular Reactor Response to Errors in Process Variables and Sensors, Price Collins, Belle R. Upadhyaya *(Univ of Tennessee-Knoxville)*

11:00 a.m.
Anistropic Azimuthal Power and Temperature Distribution Impact on Hydride Distribution, Christopher Dances, Christopher Piotroski, Michael Mankosa *(Penn State Univ)*

11:25 a.m.
Design of Dynamically Similar Spacer Grid for Fluid-Structure Interaction Studies with Surrogate Fuel Assemblies, Noah A. Wichselbaum, Philippe M. Bardet *(George Washington Univ)*

Advanced/Gen-IV Reactors

Sponsored by OPD
Session Organizer and Chair: Sandra M. Sloan
(B&W Nuclear Energy, Inc.)

Grand Ballroom, North A

8:30 a.m.
The Mitsubishi Small Module High Temperature Gas-Cooled Reactor "MHR-50/100is"— Conceptual Design of MHR-100 is for a Commercial Plant, Isao Minatsuki, Sunao Oyama, Hiroki Tsukamoto *(Mitsubishi Heavy Industries, Ltd.)*

8:50 a.m.
The IAEA Activities in Support of the Near Term Deployment of High Temperature Gas Cooled Reactors, Frederik Reitsma *(IAEA)*

9:10 a.m.
Summary of Sonoprocessing Applications for Nuclear Technologies and Potential Future Applications, Floren Rubio, Edward D. Blandford *(Univ of New Mexico)*, Leonard J. Bond *(Iowa State Univ)*

9:30 a.m.
Transient Analysis of Advanced High Temperature Reactors Using Process Simulation Software, I. Skavdahl, V. Utgikar *(Univ of Idaho)*, P. Sabharwall *(INL)*, M. Chen, I. H. Kim, X. Sun, R. N. Christensen *(Ohio State)*

9:50 a.m.

The Design Analysis of the DC Electromagnetic Pump with the Flowrate of 3 L/min, Geun Hyeong Lee, Hee Reyoung Kim *(UNIST)*

10:10 a.m.

Compact Double-Wall Twisted-Tube Heat Exchanger for the Fluoride Salt-Cooled High-Temperature Reactor (FHR) with Implications for In-Service Inspection, Joel Hughes, Edward D. Blandford *(Univ of New Mexico)*

10:30 a.m.

Neutronic Comparison of Liquid Salt Primary Coolants and Novel Assembly Design for a Fluoride Salt Cooled High-Temperature Test Reactor, Joshua Richard, Benoit Forget, Charles Forsberg, Kord Smith *(MIT)*

10:50 a.m.

Tritium Capture in Salt-Cooled Fission and Fusion Reactors, Charles Forsberg, John Stempien, Ron Ballinger *(MIT)*

11:10 a.m.

Tritium Transport and Corrosion Modeling in the Fluoride Salt-Cooled High-Temperature Reactor, John Stempien, Ron Ballinger, Charles Forsberg *(MIT)*

11:30 a.m.

Dispatchable Electricity with Salt-Cooled Reactors, Heat Storage, and Base-Load Reactor Operation, Charles Forsberg *(MIT)*

11:50 a.m.

PB-FHR Nuclear Air-Brayton Combined Cycle Natural Gas Price Sensitivity, Daniel Curtis, Charles Forsberg *(MIT)*

Transport Methods: General—I

Sponsored by MCD

Session Organizer: Ryan G. McClarren *(Texas A&M)*

Chair: Rachel Slaybaugh *(Penn State Univ)*

Grand Ballroom, North B

8:30 a.m.

A High-Order Low-Order Algorithm with Exponentially-Convergent Monte Carlo for k-Eigenvalue Problems, S. R. Bolding, Jim E. Morel *(TAMU)*

8:55 a.m.

Iterative Implicit Monte Carlo, Ben C. Yee *(Univ of Michigan),* N. A. Gentile *(LLNL)*

9:20 a.m.

A Modified Simplex Method for Choosing Monte Carlo Scattering Directions, John L. Pevey, Ronald E. Pevey *(Univ of Tennessee)*

9:45 a.m.

Analysis of Lagged Weight Windows for Implicit Monte Carlo Variance Reduction, Jacob T. Landman, Ryan G. McClarren, Jonathan R. Madsen, Alex R. Long *(TAMU)*

10:10 a.m.

Woodcock Monte Carlo Transport Through Binary Stochastic Media, Aaron J. Olson *(Univ of New Mexico, SNL),* Anil K. Prinja *(Univ of New Mexico),* Brian C. Franke *(SNL)*

10:35 a.m.

Benchmark Investigation of a 3D Monte Carlo Levermore-Pomraning Algorithm for Binary Stochastic Media, Patrick S. Brantley *(LLNL)*

11:00 a.m.

New Hash-based Energy Lookup Algorithm for Monte Carlo Codes, Forrest B. Brown *(LANL)*

11:25 a.m.

Development of a CAD Based Geometry Model in Serpent 2 Monte Carlo Code, Jaakko Leppänen *(VIT Technical Research Centre of Finland)*

General Thermal Hydraulics—II

Sponsored by THD

Session Organizer: Paolo Ferroni *(Westinghouse)*

Cochairs: Paolo Ferroni *(Westinghouse),* Fatih Aydogan *(Univ of Idaho)*

Monorail A/B

8:30 a.m.

Study on Natural Circulation and Its Transition Process for IP200, Lin Sun, Minjun Peng, Genglei Xia *(Harbin Engineering Univ)*

8:55 a.m.

Assessment of Parallel Algorithms for a Subchannel Code MATRA, Seong Jin Kim, Hyouk Kwon, Dae Hyun Hwang *(KAERI)*

9:20 a.m.

Thermal Solar Collector Predictive Modeling: I. Adjoint Sensitivity Analysis, Dan G. Cacuci *(Univ of South Carolina),* A. F. Badea *(KIT),* M. C. Badea *(Univ of South Carolina)*

9:45 a.m.

Thermal Solar Collector Predictive Modeling: II. Data Assimilation, Model Calibration, and Best-Estimate Predictions with Reduced Uncertainties, A. F. Badea *(KITS),* Dan G. Cacuci, M.C. Badea *(Univ of South Carolina)*

10:10 a.m.

Mechanistic Modeling of Heat Transfer in Supercritical Carbon Dioxide, Jianguo Zhong, M. Z. Podowski *(RPI)*

10:35 a.m.

The Thermal Hydraulics Division Award Ceremony will immediately follow the technical session. Technical Achievement Award Lecture, Dr. Jose Reyes, "Development of Design Certification Test Programs."

Advancements in Imaging, Nuclear Instrumentation, and Measurement Technologies

Sponsored by IRD
Session Organizer: Kenan Unlu *(Penn State)*
Chair: Hyoung Koo Lee *(Missouri Univ of Science and Tech)*

Monorail C

8:30 a.m.
A Novel Approach to Automatic Detection of Oral Lesions From CT Images, Shaikat Galib, Fahima Islam, Hyoung Koo Lee *(Missouri Univ of Science and Technology)*

8:55 a.m.
X-ray Digital Industrial Radiography (DIR) and Particle Tracking Velocimetry (PTV) for Local Liquid Velocity (VLL) Measurement in Trickle Bed Reactors (TBRs), Hyoung Koo Lee, Khairul Anuar Mohd Salleh, Muthanna H. Al-Dahhan *(Missouri Univ of Science and Technology)*

9:20 a.m.
Assessment of Nuclear Fuels Using Radiographic Thickness Measurement Method, Muhammad Abir, Fahima Islam, Hyoung Koo Lee *(Missouri Univ of Science and Technology)*, Daniel Wachs *(INL)*

9:45 a.m.
Sparse Sampling Tomographic Reconstruction of Radioactive Fuel Assembly, Muhammad Abir, Fahima Islam *(Missouri Univ of Science and Technology)*, Daniel Wachs *(INL)*, Hyoung Koo Lee *(Missouri Univ of Science and Technology)*

10:10 a.m.
Deterministic Simulation of Neutron Radiography and Tomography, Rajarshi Pal Chowdhury, Xin Liu *(Missouri Univ of Science and Technology)*

10:35 a.m.
Insufficient CT Data Reconstruction Based on MLEM- DTV Method, Fahima Islam, Muhammad Abir, Hyoung Koo Lee *(Missouri Univ of Science and Technology)*

11:00 a.m.
Improving Nuclear Detection: Hodoscope Orthogonal Correlation, Alexander DeVolpi *(Nuclear Applications Company)*

U.S. Department of Energy Light Water Reactor Sustainability Program

Sponsored by FED
Session Organizer: Cindie Jensen *(INL)*
Chair: Kathryn A. McCarthy *(INL)*

Castle A/B

8:30 a.m.
On Developing a Mechanistic Model and Supporting Database to Predict High Fluence-Low Flux Extended Life RPV Embrittlement: Status, Challenges and Opportunities, Peter B. Wells, Nathan Almirall, Takuya Yamamoto, G. Robert Odette *(Univ of California, Santa Barbara)*

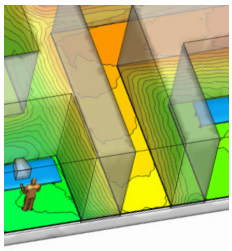
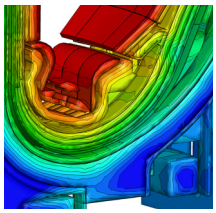
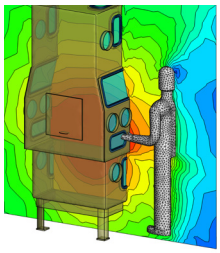
8:55 a.m.
CALPHAD and Cluster Dynamics Modeling of Ni-Mn-Si Precipitate Stability and Kinetics in Reactor Pressure Vessel Steels, Dane Morgan, Huibin Ke, Wei Xiong, Leland Barnard *(Univ of Wisconsin-Madison)*, Peter Wells, G. Robert Odette *(Univ of California, Santa Barbara)*

9:20 a.m.
Determining Remaining Useful Life of Aging Cables in Nuclear Power Plants Using Non-Destructive Evaluation, Kevin L. Simmons, Pradeep Ramuhalli, Allan Pardini, Matthew Prowant, Leonard S. Fifield, Jonathan Tedeschi, A. Mark Jones, Matt P. Westman *(PNNL)*

9:45 a.m.
Comparison of a Traditional Probabilistic Risk Assessment Approach with Advanced Safety Analysis, Diego Mandelli, Zhegang Ma, Curtis Smith *(INL)*

10:10 a.m.
Status Update on RELAP-7—A Next Generation Reactor System Analysis Code, Richard Martineau, Hongbin Zhang, Haihua Zhao, Ling Zou *(INL)*

10:35 a.m.
Implementation of an Advanced Outage Control Center, Shawn St. Germain *(INL)*

Combustible Gas Issues in Nuclear Safety–Panel

Sponsored by NISD
Session Organizer and Chair: Kevin O'Kula *(URS)*

Castle C

8:30 a.m.

In the Department of Energy (DOE) Complex, nuclear waste is contained, transported, processed, and stored. The age, composition, phase(s), and other characteristics of these constituent waste forms have widely varying distributions, and there can be appreciable degrees of uncertainty especially in older waste streams and configurations. A key concern in these situations is the potential for energetic events involving hydrogen and other combustible gases. This panel discussion will cover hydrogen and combustible gas issues and their impact to nuclear facility safety in the DOE Complex. Topics to be explored are research and development programs for facilities in design as well as operating facilities, database development and uncertainties, deterministic and probabilistic methods, lessons learned from events, regulatory needs, standards development, and recommendations for future work. We also are interested in perspectives from other industries, such as oil and gas, chemical processing, and the commercial nuclear sector (e.g., containment hydrogen under low likelihood, severe accident conditions).

Panelists:

- Michael V. Frank *(Hanford Waste Treatment Plant)*
- Richard H. Lagdon, Jr. *(DOE)*
- Joseph E. Shepherd *(California Inst of Technology)*
- J. Kelly Thomas *(BakerRisk)*

Fuel Cycle Options Analysis–Papers/Panel—I

Sponsored by FCWMD
Session Organizer: Patricia D. Paviet *(DOE)*
Chair: Bhupinder Singh *(DOE)*

Adventure

8:30 a.m.

Nuclear Fuel Cycle Options Evaluation and Screening, R. Wigeland *(INL),* T. Taiwo *(ANL),* M. Todosow, H. Ludewig *(BNL),* W. Halsey *(LLNL),* J. Gehin, R. Jubin *(ORNL),* J. Buelt *(JLB EnvEn Solutions),* S. Stockinger *(DOE),* K. Jenni *(Insight Decisions),* B. Oakley *(Scully Capital)*

8:55 a.m.

Value of Utility-Informed Perspectives and the Assessment of Implementation Pathways to Advanced Nuclear Fuel Cycle Objectives, Andrew Sowder *(EPRI)*

9:20 a.m.

Fuel Cycle Scenarios, Challenges, and Opportunities—A UK Perspective, Fiona Rayment, Tim Tinsley, Robin Taylor, Robert Gregg *(UK Natl Nucl Lab)*

Panel Discussion

9:45 a.m.

This session will focus on a comprehensive evaluation and screening of fuel cycle options being conducted for the Department of Energy. The final report for this evaluation will be made publicly available in December 2014. The main purpose of this evaluation is to guide prioritization of nuclear energy R&D by identifying the types of fuel cycle options which can provide significant benefits compared to the existing fuel cycle in the United States. The session will feature presentations from the experts conducting the study as well as from DOE program managers on how the study results are being used. EPRI and other domestic and international participants will present the results of their complementary work on this subject.

Panelists:

- Patricia Paviet *(DOE-NE)*
- Roald A. Wigeland *(INL)*
- Andrew Sowder *(EPRI)*
- Luc Van Den Durpel *(AREVA)*
- Fiona Rayment *(NNL)*

Fuel Cycle Options Analysis—II

Sponsored by FCWMD
Session Organizer and Chair: Patricia D. Paviet *(DOE)*

Adventure

10:10 a.m.

Screening and Evaluation Tool for Nuclear Fuel Cycles, Layne Pincock, Brent Dixon *(INL)*

10:35 a.m.

Analysis of a Three-Stage Fuel Cycle with Heterogenous and Homogenous Thorium-Based Fuel in Thermal Reactors and Transmutation of Transuranic Elements in an Accelerator Driven System, Nicholas R. Brown, Michael Todosow *(BNL)*

11:00 a.m.

Assessment of a Closed Fuel Cycle Using Less Attractive Material in a Small Modular Fast Reactor, N. E. Stauff, T. K. Kim, T. A. Taiwo *(ANL),* R. A. Wigeland *(INL)*

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

Thorium Resources, Recovery, Fuels and Fuel Cycles

Sponsored by FCWMD

Session Organizer: Steven L. Krahn *(Vanderbilt Univ)*

Chair: Allen G. Croft *(Vanderbilt Univ)*

Safari

8:30 a.m.

Thorium Recovery from Rare Earth Element Deposits in the U.S., Bradley Van Gosen *(U.S. Geological Survey),* Steven Krahn, Timothy Ault *(Vanderbilt Univ)*

8:55 a.m.

Separation and Purification of Thorium by Solvent Extraction Processes, Wuping Liao *(Chinese Academy of Sciences)*

9:20 a.m.

Development of LWR Fuels Utilizing Thorium Dioxide in Conjunction with both Zirconium-Based and SI-C Cladding, Saleem Drera *(Thor Energy),* Herbert Feinroth *(Ceramic Tubular Products LLC),* Julian F. Kelly, Klara Insulander Björk *(Thor Energy)*

9:45 a.m.

Neutronic Design Study of New Small LWR Core Having ThO_2-UO_2 and FCM Particle Fuels for TRU Burning, Gonghoon Bae, Ser Gi Hong *(Kyung Hee Univ)*

10:10 a.m.

Safety Issues of Thorium Utilization in Commercial LWRs, Brian Ade, Andrew Worrall, Jeffrey Powers, Steve Bowman *(ORNL)*

10:35 a.m.

Environmental Impact of Thorium Recovery from Titanium Mining in North America, Timothy Ault, Steven Krahn, Allen Croff, Raymond Wymer *(Vanderbilt Univ)*

Reactor Physics: General—II

Sponsored by RPD

Session Organizer: Alexander Stanculescu *(INL)*

Chair: Alberto Talamo *(ANL)*

Nile

8:30 a.m.

Initial Verification of Heterogeneous Multigroup Cross Sections in MC2-3/PROTEUS, Jacob S. Hader *(Purdue Univ),* Emily R. Shemon, Changho Lee *(ANL)*

8:55 a.m.

Watts Bar Unit 1 MCNPX Simulations with KENO-VI Comparisons, William Gurecky *(Univ of Texas at Austin),* Andrew Godfrey *(ORNL),* Erich Schneider *(Univ of Texas at Austin)*

9:20 a.m.

The Asymptotic Probability Distribution of Fission Numbers in a Multiplying System, Erin D. Ficht *(LANL),* Anil K. Prinja *(Univ of New Mexico)*

9:45 a.m.

The Preliminary Application of Coupled Point Kinetic Model for TMSR Safety Analysis, Jun Cai, Xiaobin Xia, Kun Chen, Mudan Mei, Jianhua Wang, Guoqing Zhang *(Chinese Academy of Sciences)*

10:10 a.m.

Comparison of Doppler Reactivity Between Thorium and Uranium Fuels in LWR, Noboru Dobuchi, Takuya Mishiro, Takanori Kitada *(Osaka Univ)*

10:35 a.m.

Modernization and Expansion of Isotopic Depletion Capabilities within the NESTLE 3D Nodal Simulator, P. Eric Collins, Nicholas Luciano, G. Ivan Maldonado *(Univ of Tennessee-Knoxville)*

11:00 a.m.

Evaluation of an Integral Homogenization Approach for LWSMR Core Neutronics Discretization, Ahmad Al Rashdan, Pavel Tsvetkov *(TAMU)*

Reactor Physics Design, Validation, and Operating Experience

Sponsored by RPD

Session Organizer Alexander Stanculescu *(INL)*

Cochairs: Sandra Dulla *(Politechnico diTorino),* Cristian Rabiti *(INL)*

Amazon

8:30 a.m.

Direct Imaging of a Godiva IV Burst at NCERC, J. D. Goettee, E. I. Esch, J. M. Goda, D. K. Hayes, D. R. Mayo, W. L. Myers *(LANL)*

8:55 a.m.

Similarity Assessment of the BFS-109-2A Axial Expansion Experiment Using a Novel Jacobian Matrix Method, Sunghwan Yun, Sang Ji Kim *(KAERI)*

9:20 a.m.

Burst Initiation Probability Experiments at CFBR-II, Liu Xiaobo, Peng Xianjui, Lei Jiarong *(China Academy of Engineering Physics)*

9:45 a.m.

Determination of Bias, Bias Uncertainty, and Coverage Using Data Assimilation, Paridhi Athe *(NCSU),* Ugur Mertyurek *(ORNL),* Hany S. Abdel-Khalik *(NCSU)*

10:10 a.m.

Three-Dimensional Modeling of the Physics of the Transient Reactor Test (TREAT) Facility, Joseph Templeton, Mario Ortega, Cassiano de Oliveira *(Univ of New Mexico)*

Making Ethics Real in Nuclear Engineering–Panel

Sponsored by RPSD

Session Organizer and Chair: Robert B. Hayes *(Nuclear Waste Partnership, LLC)*

Wilderness

8:30 a.m.

Panelists:

- Ethics and Safety, Michaele C. Brady Raap *(Keynote, PNNL, ANS President)*
- Ethics by Example from Management, Donald Hoffman *(EXCEL Services Corp, ANS past president)*
- Ethics When Nobody is Watching, Edward L. Quinn *(Technology Resources, ANS past president)*
- Ethics in the Workplace, Mark Peres *(Fluor)*
- Some Engineering Ethics Cases and Their Resolution by NSPE, Nicholas Tsoulfanidis *(UNR, Nuclear Technology)*
- Overcoming Fear to Behave Ethically, Peter Caracappa *(RPI)*
- Ethics Expectations from the Public, Vic Uotinen *(Past ANS Ethics Chair)*
- Ethics in Commerce and Procurement, Tim Martinson *(Canberra)*
- Ethics Everywhere Always, Kevan Weaver *(TerraPower)*

Evolving Aspects of Decommissioning Commercial Power Reactors in the United States–Panel

Sponsored by DESD

Session Organizer and Chair: Richard J. St. Onge *(Vista Connections)*

Western

8:30 a.m.

Recently, several U.S. Commercial Power Reactors have permanently shut down. These announcements follow a decade long absence of Power Reactor closures. This new fleet of decommissioning plants is picking up a regulatory process that has been largely dormant. In this session, participants will share ongoing problems, innovations, and lessons learned as this group of plants moves forward in the back end of the Power Production cycle. Challenges in Staffing, Licensing, Security, Emergency Response and Rad Waste will be presented along with some proposed solutions and a few lingering questions, such as, "What comes next?".

Panelists:

- Doug Broaddus *(NRC)*
- Mark Richter *(NEI)*
- Gerry Vannoordennen *(Zion)*
- Jack Gadzala *(Kewaunee)*
- David Daigle *(Enercon)*
- Phyllis Dixon *(Crystal River)*

Cybersecurity: Protecting Our Digital Assets–Panel

Sponsored by ETWDD

Session Organizer and Chair: Jane A. LeClair *(Excelsior Coll)*

Columbia

8:30 a.m.

As the energy sector was the target of nearly 40% of all reported cyber attacks on critical infrastructure in 2012, according to the Department of Homeland Security, and continues to be under attack, the nuclear community is vigilant in protecting their digital systems against intrusion. Safety, including digital safety, is and has been the priority in the nuclear industry. This session will discuss the efforts the nuclear industry has made over the past ten years to protect our assets.

Panelists:

- Gary Garrett *(INPO)*
- Nathan L. Faith *(Exelon Generation)*
- Todd Fineberg *(Entergy)*
- Bill Gross *(NEI)*

Special Session: Global Seismic Safety Issues After the Fukushima Daiichi Accident: On Identification and Treatment of Uncertainty about Seismic Issues–Panel

Grand Ballroom

10:00 a.m.

"Reducing uncertainties of seismic issues by comprehensive simulations with High Performance Computing (HPC) and formulating practical PRA methodologies"

This special session will focus on the following important issues that arose after the accident at the Fukushima Daiichi NPP:

- To introduce some outcomes of natural-hazard simulation with High Performance Computing (HPC) from Japan.
- How to decrease uncertainties of Natural Phenomena, such as "Diffuse Seismicity" and "amount of surface displacement induced by Capable Faults after earthquake", with HPC.
- To discuss the applicability of seismic PRA with HPC to NPP Regulation.

Moderator

Prof. George Apostolakis *(MIT)*

Panelists

- Prof. Tsuyoshi Takada *(Graduate School of Engineering, Department of Architecture, University of Tokyo)*
- Prof. Muneo Hori *(Earthquake Research Institute, University of Tokyo)*
- Prof. Koji Okumura *(Graduate School of Letters, Department of Geography, Hiroshima University)*
- Dr. Mark D. Petersen *(Supervisory Research Geophysicist, Northwest Region, USGS)*
- Prof. Boris Jeremic *(Department of Civil and Environmental Engineering University of California Davis)*
- Dr. Nilesh Chokshi *(NRC Consultant)*

Computational Methods: General—I

Sponsored by MCD
Session Organizer: Ryan G. McClarren *(Texas A&M)*
Chair: Daniel F. Gill *(BAPL)*

Grand Ballroom, South A

1:00 p.m.
Differential Quadrature Approximation of the Angular Derivative Terms in the Curvilinear-Coordinates SN Equations, J. S. Warsa *(LANL),* A. K. Prinja *(Univ of New Mexico)*

1:25 p.m.
Extension of the Entropy Viscosity Method to the Low-Mach Regime for the Multi-Dimensional Euler Equations, Marc O. Delchini, Jean C. Ragusa, Ray A. Barry *(TAMU)*

1:50 p.m.
A DFEM Formulation of the Diffusion Equation on Arbitrary Polyhedral Grids, Michael W. Hackemack, Jean C. Ragusa *(TAMU)*

2:15 p.m.
Validation of Full-Domain Massively Parallel Transport Sweep Algorithms, W. Daryl Hawkins *(TAMU),* Teresa S. Bailey *(LLNL),* Marvin A. Adams *(TAMU),* Peter N. Brown, Adam J. Kunen *(LLNL),* Michael P. Adams, Timmie Smith, Nancy Amato, Lawrence Rauchwerger *(TAMU)*

2:40 p.m.
Scalability of Monte Carlo Cross-Section Lookup Algorithms for Large Models, David P. Griesheimer *(Bechtel Marine Propulsion Corp)*

3:05 p.m.
Using Composite Nuclides to Reduce Cross Section Lookups in Monte Carlo Transport Simulations, David P. Griesheimer, Reza R. Gouw *(Bechtel Marine Propulsion Corp)*

3:30 p.m.
The Effects of Reference Remapping in WARP, a GPU-Accelerated, Continuous Energy Monte Carlo Neutron Transport Framework, Ryan M. Bergmann, Jasmina L. Vujic *(Univ of California-Berkeley)*

3:55 p.m.
The Influence in Disregarding the First Approximation of Bethe-Plackzec in the Calculation of Resonance Self-Shielding Factors, Daniel A. P. Palma *(CNEN),* Alessandro C. Gonçalves, Aquilano S. Martinez *(PEN/COPPE),* Amir Z. Mesquita *(CDTN)*

Communicating the Benefits of Nuclear Energy in the Age of the Shale Gale–Panel

Sponsored by ETWDD
Session Organizer and Chair: Mimi H. Limbach *(Potomac Communications Group)*

Grand Ballroom, South B

1:00 p.m.
America's existing fleet of nuclear plants represents a high-value national asset. However, unconventional gas recovery has brought large volumes of cheap fuel to market and the low cost of natural gas has reshaped electricity markets. The shift to gas-fired generation, coupled with statewide renewable requirements, has introduced new economic pressures on nuclear operators. Panelists will discuss communication efforts underway around the country to raise awareness of the impact of premature plant closures and the importance of maintaining nuclear energy as a source of electricity throughout the country.

Panelists:
- Joe Watson *(Exelon Generation)*
- Laura Scheele *(Energy Northwest)*
- Jone-Lin Wang *(IHS CERA)*
- Kelle Barfield *(Entergy)*

Finding Common Ground with New Audiences–Panel

Sponsored by ETWDD
Session Organizer and Chair: Laura Hermann *(Potomac Communications Group)*

Grand Ballroom, South B

2:35 p.m.
Many ANS professionals strive to keep up with ever-evolving public education and outreach tactics. New communications channels create new opportunities and challenges, presenting more unique points of view on nuclear science and technology. This transformation makes targeting the right information to the right audiences at the right time essential to successful communication. In this panel, experts will discuss innovative techniques that communicators use to create discussion and dialogue with distinct audiences.

Panelists:
- Vaughn Gilbert *(Westinghouse)*
- Jamie Williams *(NEI)*
- Jessica Lovering *(The Breakthrough Inst)*

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

New Nuclear Construction Around the World–Panel

Sponsored by OPD
Session Organizer: Edward L. Quinn *(Technology Resources)*
Cochairs: Edward L. Quinn *(Technology Resources),* Corey McDaniel *(Chair, ANS International Committee)*

Grand Ballroom, North A

1:00 p.m.

This session addresses the latest status and lessons learned in new nuclear construction in the U.S. and in selected countries around the world. Speakers come from the DOE, NRC, NEI and representatives of countries in the process of new build or in the planning stages.

Panelists:

- Alexandr Superfin *(Rosatom)*
- Sal Golub *(DOE NE)*
- Larry Burkhart *(NRC)*
- Doug Walters *(NEI)*

Nuclear Fuels

Sponsored by MSTD
Session Organizer and Chair: Kenneth J. Geelhood *(PNNL)*

Grand Ballroom, North B

1:00 p.m.

Surface Mapping of Single Crystal ThO_2 with Atomic Force Microscopy, Scott Key, Tony D. Kelly, Alex Li, James Petrosky, John W. McClory *(Air Force Inst. of Technology),* J. Matthew Mann *(Air Force Research Lab)*

1:25 p.m.

Photoemission Studies of Single Crystal Thorium-Uranium Dioxide Alloys, Glenn Peterson, Tony D. Kelly, James C. Petrosky *(Air Force Inst. of Technology),* David Turner *(Oak Ridge Inst. for Science and Education),* John W. McClory *(Air Force Inst. of Technology),* J. Matthew Mann *(Air Force Research Lab),* Joseph Kolis *(Clemson Univ)*

1:50 p.m.

The Effect of Fuel Size on the Performance of a U-Mo/Al Dispersion Fuel, Yeon Soo Kim *(ANL),* J. M. Park *(KAERI),* B. Ye *(ANL)*

2:15 p.m.

Preliminary Studies on Volatile Fission Gas Distribution in Minor Actinide-Bearing Metal Fuel, L. Capriotti,S. Bremier *(Joint Research Centre),* K. Inagaki *(CRIEPI),* P. Pöml, D. Papaioannou *(Joint Research Centre),* H. Oha, T. Ogata *(CRIEPI),* V. V. Rondinella *(Joint Research Centre)*

2:40 p.m.

Reactor Physics Implications of Advanced SiC-Clad Fuel in PWRs, D. Bloore, K. Shirvan, E. E. Pilat, M. S. Kazimi *(MIT)*

3:05 p.m.

Transient Experiment Design for Accident Tolerance Fuels, N. E. Woolstenhulme, D. M. Wachs, A. A. Beasley *(INL)*

Computational Thermal Hydraulics—I

Sponsored by THD
Session Organizer and Chair: David L. Aumiller *(BAPL)*

Monorail A/B

1:00 p.m.

CFD Modeling of Heat and Mass Transfer in Heat Exchangers of Sodium-Cooled Fast Reactor Systems, Emre Tatli, Milorad B. Dzodzo, Paolo Ferroni *(Westinghouse)*

1:25 p.m.

A Novel Approach on Modeling Fluid-Structure Interactions for a Fuel Plate, T. K. Howard, W. R. Marcum *(Oregon State Univ),* W. F. Jones *(INL)*

1:50 p.m.

Direct Numerical Computation of Lift Force in Low Viscosity Fluid, Zhongchun Li *(Tsinghua Univ),* Xiaoming Song *(Nuclear Power Inst of China),* Shengyao Jiang *(Tsinghua Univ)*

2:15 p.m.

A Code Verification Method for Governing Equations of Two-Fluid Model, Hao Zhang, Zhao Guo Wu, Yi Xue Chen *(SNPSDC)*

2:40 p.m.

CORONA Analysis with Consideration of Bypass Flow Gap Size Distribution, Nam-il Tak, Sung Nam Lee, Min Hwan Kim, Jae Man Noh *(KAERI)*

3:05 p.m.

Thermal Predictions of the Cooling of Waste Glass Canisters, Donna Post Guillen *(INL)*

3:30 p.m.

Development of the Code COAC for Oxidation during Core Melting, Keyou Mao, Yapei Zhang *(Xi'an Jiaotong Univ),* Michael L. Corradini *(Univ of Wisconsin-Madison)*

3:55 p.m.

RELAP RCIC Pump Homologous Curves Generation and Verification for Fukushima Unit 2, Hector Lopez, Nejdet Erkan, Okamoto Koji *(Univ of Tokyo)*

Isotopes and Radiation: General

Sponsored by IRD
Session Organizer: Igor Jovanovic *(Penn State)*
Chair: Kenan Unlu *(Penn State Univ)*

Monorail C

1:00 p.m.
Radioxenon Availability for Transport after Fission, S. R. Bielgalski *(Univ of Texas at Austin)*

1:25 p.m.
A Comparison of the Effects of the Hydroforming and Draw-Plug Assembly Methods on the Thermal-Stresses in an Annular Target with an LEU-Foiland Electroplated Nickel Recoil Barrier, S. G. Govindarajan, G. L. Solbrekken *(Univ of Missouri)*

1:50 p.m.
Experimental Verification of a Combined Porosity and C/O Logging Tool, Walid A. Metwally *(Univ of Sharjah),* Qiong Zhang, Feyzi Inanc *(Baker Hughes)*

2:15 p.m.
Nuclear Measurement of Water Level and Fuel Concentration for Spent-Fuel Pools and Reactors, Alexander DeVolpi *(Nuclear Applications Company)*

2:40 p.m.
Progress on a Petawatt Laser Driven Intense Pulsed Neutron Source, George H. Miley *(Univ of Illinois at Urbana-Champaign)*

3:05 p.m.
An Evaluation of Compton Suppression NAA in the Determination of Arsenic in Drinking Water in Surfside, Texas, Shauna G. Landsberger, G. George *(Enviroklean Product Development Inc.),* Sheldon Landsberger, Gleb Kuzmin *(Univ of Texas at Austin)*

3:30 p.m.
In Situ Determination of Radionuclides in the Oil and Gas Fields, Sheldon Landsberger, Jacob Morton *(Univ of Texas at Austin),* Shauna G. Landsberger, G. George *(Enviroklean Product Development Inc.),* Michael Moyamezi, Brad Hurst *(Bridgeport Instruments LLC)*

3:55 p.m.
Quality Assurance for Gamma-Gamma Coincidence in a Two Source Complex Spectrum, Michael Yoho, Sheldon Landsberger *(Univ of Texas at Austin)*

4:20 p.m.
93-Nb Thermal Neutron Capture Cross-Section from Prompt Gamma-Ray Intensities, Danyal Turkoglu *(Ohio State Univ),* Shamsuzzoha Basunia, Aaron Hurst, Richard Firestone *(LBNL),* Laszlo Szentmiklosi, Lei Cao *(Institut of Isotopes)*

Experimental Thermal Hydraulics—I

Sponsored by THD
Session Organizer: Yang Liu *(Virginia Polytech Inst & State Univ)*
Cochairs: Kurshad Muftuoglu *(GE Hitachi Nuclear Energy),* Caleb Brooks *(Univ of Illinois)*

Castle A/B

1:00 p.m.
Design and Assembly of Experimental Facility for CRUD Characterization and Mitigation at PWR Cladding Conditions, Ittinop (Pun) Dumnernchanvanit, Naiqiang Zhang, Alexandra R. Delmore, Michael P. Short *(MIT)*

1:25 p.m.
Compression of Fibrous Porous Media Generated on Containment Sump Strainers, Saya Lee, Matthew Kappes, Yassin A. Hassan *(TAMU)*

1:50 p.m.
Size Characterization of Fibrous Nukon Debris Upstream and Downstream of the Containment Sump Strainer, Matthew Kappes, Saya Lee, Yassin A. Hassan *(TAMU)*

2:15 p.m.
Interfacial Shear Measurement of a Wavy Gas-Liquid Interface, Matthieu A. Andre, Philippe M. Bardet *(George Washington Univ)*

2:40 p.m.
CHF Study on Effect of Wettability under Pressurized Condition for Downward Facing Surface, Hae Min Park, Yong Hoon Jeong *(KAIST)*

3:05 p.m.
High Pressure Condensation in Small Modular Reactor Containments, Etienne Mullin *(Oregon State Univ),* Claudio Delfino *(NuScale Power LLC),* Qiao Wu *(Oregon State Univ),* Jose Reyes *(NuScale Power LLC)*

3:30 p.m.
Experimental Study of Twin Turbulent Parallel Jets Using an Open-Source Three Dimensional Particle Tracking Velocimetry Software, Elvis Dominguez-Ontiveros, Hristo Goumnerov, Yassin Hassan *(TAMU)*

Current Topics in Probabilistic Risk Analysis

Sponsored by NISD
Session Organizer: William C. Horak *(BNL)*
Chair: Robert Bari *(BNL)*

Castle C

1:00 p.m.
A Scoping Study of Direct Containment Heating in a Small Modular Reactor, Chih-Wei Chang, Nam Dinh *(NCSU)*

1:25 p.m.
Comparison of Reliability Criteria Determination Methods in Maintenance Rule, Dong-Wook Jerng, Man Cheol Kim *(Chung-Ang Univ)*

1:50 p.m.
Conditional Failure Probability Evaluating for NPPs Risk Monitoring, Min Zhang, Zhijian Zhang, Yingfei Ma *(Harbin Engineering Univ)*

2:15 p.m.
Probabilistic Risk Assessment of Vented Fuel System for Gen. IV Gas Fast Reactor, Renae Lenhof, Andrew Klein *(Oregon State Univ)*

2:40 p.m.
Methodology for the Incorporation of Passive Component Aging Modeling into the RAVEN/RELAP-7Environment, Askin Guler *(Ohio State Univ),* Diego Mandelli, Andrea Alfonsi, Joshua Cogliati, Cristian Rabiti *(INL),* Tunc Aldemir *(Ohio State Univ)*

3:05 p.m.
Adaptive Dynamic Event Tree in RAVEN Code, Andrea Alfonsi, Cristian Rabiti, Diego Mandelli, Joshua Cogliati, Robert Kinoshita *(INL)*

Fuel Cycle Options Analysis—III

Sponsored by FCWMD
Session Organizer: Bhupinder Singh *(DOE)*
Chair: Sungyeol Choi *(KAERI)*

Adventure

1:00 p.m.
Evaluation Criteria for Analyses of Nuclear Fuel Cycles, Margaret Flicker, Erich Schneider, Paul Campbell *(Univ of Texas at Austin)*

1:25 p.m.
Development of Integrated Assessment Model for Nuclear Fuel Cycle Options, Sungyeol Choi, Won Il Ko *(KAERI)*

1:50 p.m.
Deployment Optimization with the CYCLUS Fuel Cycle Simulator, Robert W. Carlsen, Matthew J. Gidden, Paul P. H. Wilson *(Univ of Wisconsin-Madison)*

2:15 p.m.
Extensions to the CYCLUS Ecosystem in Support of Market-Driven Transition Capability, Kathryn D. Huff, Massimiliano Fratoni *(Univ of California-Berkeley),* Harris R. Greenberg *(LLNL)*

2:40 p.m.
Impacts of Nuclear Material Management Approaches on Fuel Cycle Performance, T. A. Taiwo, T. K. Kim, N. E. Stauff *(ANL),* R. A. Wigeland *(INL)*

3:05 p.m.
Fuel Cycle Assessment: Evaluation and Analyses Using ORION for U.S. Fuel Cycle Options, Eva Sunny *(ORNL),* Robert Gregg *(UK Natl Nucl Lab),* Tim Ault *(Vanderbilt Univ),* Jess Gehin, Josh Peterson, Jeff Powers, Andrew Worrall *(ORNL)*

Thorium Reactors

Sponsored by FCWMD; cosponsored by RPD
Session Organizers: Steven L. Krahn *(Vanderbilt Univ),* Blair Bromley *(Canadian Nuclear Society)*
Chair: Blair Bromley *(Canadian Nuclear Society)*

Safari

1:00 p.m.
Heterogeneous Annular Core Concepts for Plutonium-Thorium Fuels in Pressure-Tube Heavy Water Reactors, Blair P. Bromley *(Canadian Nuclear Society)*

1:25 p.m.
Innovative Portable Small Nuclear Reactor Using Ceramic Micro-Encapsulated Thorium Fuel, Michael Worrall, Zeev Shayer *(Colorado School of Mines)*

1:50 p.m.
Study of Advanced Sodium-Cooled Burner Reactors with External and Internal Thorium Blankets, Guanheng Zhang, Jasmina Vujic, Ehud Greenspan *(Univ of California-Berkeley)*

2:15 p.m.
Thorium Fuelled Resource-Renewable BWR (RBWR) Design Update, Phillip Gorman, Sandra Bogetic, Jia Hou, Jeffrey E. Seifried, Guanheng Zhang, Jasmina Vujic, Ehud Greenspan *(Univ of California-Berkeley)*

2:40 p.m.
Simulations of a Heavy-Water Reactor Operating on Self-Sufficient Equilibrium Thorium Cycles, Sourena Golesorkhi *(Univ of Ontario Inst. of Technology),* Blair P. Bromley *(Canadian Nuclear Society),* Matthew H. Kaye *(Univ of Ontario Inst. of Technology)*

3:05 p.m.
Feasibility of Thorium-Hydride Fueled Sodium-Cooled Self-Sustaining Reactors, Guanheng Zhang, Ehud Greenspan *(Univ of California-Berkeley)*

3:30 p.m.
Burning Weapons Grade Plutonium in Thorium and Uranium with Silicone-Carbide Cladding, Nathan Andrews, Yanin Sukjai, Koroush Shirvan, Ed Pilat, Mujid S. Kazimi *(MIT)*

3:55 p.m.
Liquid Fuel Molten Salt Reactors for Thorium Utilization, Jess C. Gehin, Jeffrey J. Powers *(ORNL)*

Reactor Physics: General—III

Sponsored by RPD
Session Organizer: Alexander Stanculescu *(INL)*
Chair: Gerardo Aliberti *(ANL)*

Nile

1:00p.m.
The Development of the Variational Nodal Method, E.E. Lewis *(Northwestern Univ),* invited, Eugene P. Wigner Reactor Physicist Award Lecture

1:25 p.m.
Validation of Updated Resonance Reconstruction Module of RXSP Code Based on R-Matrix Limited Formula, Jiankai Yu, Wanlin Li, Kan Wang *(Tsinghua Univ)*

1:50 p.m.
Preliminary Assessment of nTRACER and McCARD Direct Whole Core Transport Solutions to VERA Core Physics Benchmark Problems, Min Ryu, Hyun Ho Cho, Chang Hyun Lim, Yeon Sang Jung, Han Gyu Joo *(Seoul National Univ)*

2:15 p.m.
Neutronics Analyses for an LEU Core for TREAT, Dimitrios C. Kontogeorgakos, Heather M. Connaway, Arthur E. Wright, Gokhan Yesilyurt, Keith L. Derstine *(ANL),* Mark D. DeHart, Sean R. Morrell *(INL)*

2:40 p.m.
Flexible Uncertainty Analysis of Computer Models with Alchemy, Jason M. Hite, Congjian Wang, Bassam Khuwaileh, Hany S. Abdel-Khalik *(NCSU)*

3:05 p.m.
Preliminary Investigation of Fission and Surface Source Iteration Scheme in Domain Decomposition Method for Whole-Core Monte Carlo Calculation, YuGwon Jo, Nam Zin Cho *(KAIST)*

Physics and Engineering Analysis of Sub-Critical Driven Systems—I

Sponsored by RPD; cosponsored by FCWMD, AAD, FED
Session Organizers: James F. Stubbins *(Univ of Illinois),* Blair P. Bromley *(Canadian Nuclear Society)*
Chair: Cristian Rabiti *(INL)*

Amazon

1:00 p.m.
A Laser Fusion Thorium Breeding Reactor, Sümer Şahin *(Atlim Univ),* Başar Şarer, Yurdunaz Çelik *(Gazi Univ)*

1:25 p.m.
Neutronic Analysis on Coolant Options in a Hybrid Reactor System for High Level Waste Transmutation, Seong-Hee Hong, Myung Hyun Kim *(Kyung Hee Univ)*

1:50 p.m.
Conceptual Design of an Accelerator-Driven Subcritical System to Dispose the Minor Actinide Fuels, Yan Cao, Yousry Gohar, Elia Merzari, Adam R. Kraus *(ANL)*

2:15 p.m.
Preliminary Neutronic Study of An MIT Reactor Driven Fluoride-Salt-Cooled Sub-Critical System, Kaichao Sun, Lin-wen Hu, Charles Forsberg *(MIT)*

2:40 p.m.
Design and R&D Activities of Subcritical Reactors to Support Nuclear Fuel Cycle of China, Yican Wu, FDS Team *(Chinese Academy of Sciences)*

Computational Tools for Radiation Protection and Shielding

Sponsored by RPSD
Session Organizer: Peter F. Caracappa *(RPI)*
Chair: Sukesh K. Aghara *(Univ of Massachusetts Lowell)*

Wilderness

1:00 p.m.
Development and Verification of the Fixed Source Photon Transport in RMC Code, Xiao Fan *(Peking Univ, Tsinghua Univ),* Kan Wang *(Tsinghua Univ),* Guohui Zhang *(Peking Univ)*

1:25 p.m.
A New Stochastic Global Optimization Method for Inverse Transport Problems, Jerawan C. Armstrong, Jeffrey A. Favorite *(LANL)*

1:50 p.m.
Status on the Development of a Monte Carlo Methods Research Framework, Alex Robinson *(Univ of Wisconsin-Madison),* Brian Kiedrowski *(LANL),* Douglass Henderson *(Univ of Wisconsin-Madison)*

2:15 p.m.
PyNE Progress Report, Cameron R. Bates *(LLNL, Univ of California-Berkeley),* Elliott Biondo *(Univ of Wisconsin-Madison),* Kathryn Huff *(Univ of California-Berkeley),* Kalin Kiesling, Anthony Scopatz, Robert Carlsen, Andrew Davis, Matthew Gidden, Tim Haines *(Univ of Wisconsin-Madison),* Joshua Howland, Blake Huff *(Univ of California-Berkeley),* Kevin Manalo *(Georgia Tech),* Arielle Opotowsky *(Univ of Wisconsin-Madison),* Rachel Slaybaugh *(Univ of California-Berkeley),* Eric Relson *(Univ of Wisconsin-Madison),* Paul Romano *(MIT),* Patrick Shriwise *(Univ of Wisconsin-Madison),* John D. Xia *(Univ of Chicago),* Paul Wilson, Julie Zachman *(Univ of Wisconsin-Madison)*

2:40 p.m.
Quality Assurance Within the PyNE Open Source Toolkit, Elliott Biondo, Anthony Scopatz, Matthew Gidden *(Univ of Wisconsin-Madison),* Rachel Slaybaugh, Cameron Bates *(Univ of California-Berkeley),* Paul P. H. Wilson *(Univ of Wisconsin-Madison)*

3:05 p.m.
A Verification of MCNP6 FMESH Tally Capabilities, Alicia L. Swift, Edward A. McKigney, Richard C. Schirato, Alex P. Robinson, Brian A. Temple *(LANL)*

Industry Perspectives on the Decommissioning of Nuclear Facilities–Panel

Sponsored by DESD
Session Organizer and Chair: Richard J. St. Onge *(Vista Connections)*

Western

1:00 p.m.

In the past 80 years, Scientists and Engineers have been harnessing the power of the atom in many unique and different ways. Part of the social contract that permits the peaceful use of Nuclear Science is that safety to the public and workers is a paramount requirement. The obligation to ensure safe use and storage of nuclear materials does not end with the operational phase of the facility, it ends when the facility has been decommissioned and remediated to eliminate the nuclear hazard.

In this session, Industry participants will share experiences and advancements at nuclear facilities that have been through their operating cycles and have now entered, or are actively in, decommissioning. Emphasis will be on both the decommissioning and remediation technologies that have matured over the past years as well as innovations in managing these often complex projects.

Panelists:

- Jeff Hays *(AREVA)*
- Mike Lackey *(Fluor)*
- Mark Gake *(Black & Veatch)*
- Robert Woodard *(Energy Solutions)*
- Richard McGrath *(EPRI)*

Human Factors, Instrumentation, and Controls—Instrumentation and Controls: General

Sponsored by HFICD
Session Organizer: Sacit M. Cetiner *(ORNL)*
Chair: Jamie Baalis Coble *(Univ of Tennessee)*

Columbia

1:00 p.m.

Reactor Power Reconstruction from External Core Distributed Measurement, Charles Stratton, Pavel Tsvetkov *(TAMU)*

1:25 p.m.

Development of Digital-Device-Based Work Verification System for Cooperation in Nuclear Power Plants (NPPs), Seung Min Lee *(KAIST),* Hyun Chul Lee *(KAERI),* Poong Hyun Seong *(KAIST)*

1:50 p.m.

Ultrasonic Waveguide Transducer for Under-Sodium Defect Detection and Component Recognition, H.-T. Chien, W. P. Lawrence, D. Engel, S.-H. Sheen, C. Grandy *(ANL)*

2:15 p.m.

Digital Dynamic Compensation Methods of Vanadium Self Powered Neutron Detector, Xingjie Peng *(Tsinghua Univ, Nucl Power Inst. of China),* Qing Li *(Nucl Power Inst. of China),* Kan Wang *(Tsinghua Univ)*

Nuclear Industry Role in Nonproliferation Initiatives–Panel

Sponsored by NNTG
Session Organizer and Chair: Steven P. Nesbit *(Duke Energy)*

Mississippi

1:00 p.m.

The changing nuclear landscape and the integrated nature of the world's nuclear industry strengthen the case for a concerted effort by industry and government to develop jointly a new set of understandings of what the future nuclear proliferation dangers are, and to work closely together in the design and implementation of measures to prevent such proliferation. Panelists will cover export control, first line of detection, fuel cycle, transportation, cooperative development programs, and new proactive/enhanced measures being evaluated for nonproliferation.

Panelists:

- David Blee *(Nuclear Infrastructure Council)*
- Brian Wilkes *(CB & I–MOX Services)*
- Everett Redmond *(NEI)*
- Joyce Connery *(National Security Council)*
- Paul Longsworth *(Fluor Daniel)*

Transport Methods: General—II

Sponsored by MCD
Session Organizer: Ryan G. McClarren *(Texas A&M)*
Chair: Brian R. Nease *(Bettis Lab)*

Grand Ballroom, South A

4:20 p.m.

Measuring Angular Discretization Error During TRT Simulations with Energy Collapsed, Single Group Calculations, Alex R. Long, Ryan G. McClarren *(TAMU)*

4:45 p.m.

Cellwise Block Iteration as a Multigrid Smoother for Discrete-Ordinates Calculations I: Theory, Jeffery D. Densmore, Daniel F. Gill, Justin M. Pounders *(BAPL)*

5:10 p.m.

Cellwise Block Iteration as a Multigrid Smoother for Discrete-Ordinates Calculations II: Numerical Results, Daniel F. Gill, Jeffery D. Densmore, Justin M. Pounders *(BAPL)*

5:35 p.m.

Residual Monte Carlo Using Kernel Density Estimators, Brian R. Nease, Jeffrey D. Densmore *(BAPL),* David L. Millman *(ProductionPro)*

Research by U.S. DOE CASL Students–Panel

Sponsored by ETWDD
Session Organizer: Lisa M. Marshall *(NCSU)*
Chair: J. Michael Doster *(NCSU)*

Grand Ballroom, South B

4:00 p.m.

The Consortium for Advanced Simulation of Light Water Reactors (CASL) is a DOE energy innovations HUB that will address, through new insights afforded by its modeling and simulation (M&S) technology, key nuclear energy industry challenges to furthering power uprates, higher burnup, and/or lifetime extension while providing higher confidence in enhanced nuclear safety. The CASL Educational Program supports Undergraduate research opportunities at its partner Universities. This session will highlight a variety of students' work to date.

Panelists:

- Carolyn Coyle *(MIT)*
- Aaron Graham *(Univ of Michigan)*
- Jesse Jones *(NCSU)*
- William MacFee *(NCSU)*
- Aaron Matthew Thomas *(NCSU)*

Computational Modeling and Corrosion in Nuclear Systems

Sponsored by MSTD
Session Organizer: Kenneth J. Geelhood *(PNNL)*
Chair: Janelle Wharry *(Boise State Univ)*

Grand Ballroom, North B

4:00 p.m.

Simulation of Radiation Re-solution in Uranium Carbide, Christopher Matthews, Andrew Klein *(Oregon State Univ)*

4:20 p.m.

Anisotropic Azimuthal Power and Temperature Distribution Impact on Hydride Distribution, Christopher Dances, Christopher Piotroski, Michael Mankosa *(Penn State Univ)*

4:40 p.m.

Redwing: a MOOSE Application for Coupling MPACT and BISON, Michael Rose, Thomas Downar *(Univ of Michigan),* Frederick N. Gleicher *(INL)*

5:00 p.m.

An Experimental Study on Bending Fatigue Test with a Krouse-Type Fatigue Specimen, Ahmed S. Haidyrah, Carlos H. Castaño, Joseph W. Newkirk *(Missouri Univ of Science and Technology)*

5:20 p.m.

Numerical Study of Eddy Current Flaw Detection Techniques in Liquid Metal Reactor, Mohammad R. Quddes, Leonard J. Bond, John R. Bowler *(Iowa State Univ)*

5:40 p.m.

Monitoring the Structural Change of Graphite under Fast Proton Radiation, H. Xiao, E. F. O'Donnell, P. J. Pinhero *(Univ of Missouri, Columbia)*

Thermal Hydraulics Analyst 2.1–Panel

Sponsored by THD
Session Organizers: Elia Merzari *(ANL),* Bilbao y León *(VCU)*
Chair: Elia Merzari *(ANL)*

Monorail A/B

4:00 p.m.

The U.S. Department of Energy and other national and international research organizations are investing significant amounts of resources in updating or developing new tools for multi-physics analysis of nuclear reactor systems. Most of these new tools are based on radically different methods than traditional system analysis codes. This is particularly true in the area of thermal hydraulics, where for a number of years first principle-based approaches have started to be used in conjunction with or be coupled to traditional system codes. How will current and future trends change the profession of reactor analyst? How would this affect the skills needed to perform an analysis? Are the universities prepared for this paradigm shift? These are just a few of the questions that we will address following a similar panel session at the ANS 2013 Winter Meeting.

Panelists:

- Yassin Hassan *(TAMU)*
- Sofiane Benhamadouche *(EDF)*
- Zeses E. Karoutas *(Westinghouse)*
- Richard Bauer *(Bettis)*
- Kurshad Muftuoglu *(GE Hitachi Nuclear Energy)*
- Thomas Remick *(APS)*

Accelerator Applications: General

Sponsored by AAD
Session Organizer: Erich A. Schneider *(Univ of Texas, Austin)*
Chair: Jeffrey Johnson *(ORNL)*

Monorail C

4:00 p.m.
Upper Limits of Accelerator-Driven Systems with Breeder Materials, Sümer Şahin *(Atilim Univ),* Başar Şarer, Yurdunaz Çelik *(Gazi Univ)*

4:25 p.m.
Production of a Tritium-Based Betavoltaic Battery Source via Cyclotron Irradiation, E. F. O'Donnell, H. Xiao, T. Liu, M. T. Bernards, P. J. Pinhero *(Univ of Missouri, Columbia)*

4:50 p.m.
Neutron Capture Cross Section Measurements Using a Lead Slowing-Down Spectromemter, N. Thompson, A. Lewis, E. Blain, A. Daskalakis, Y. Danon *(RPI)*

5:15 p.m.
High Power From Fixed-Field Rings in the ADS-Reactor Application, F. Méot, N. Brown, M. Haj Tahar, M. Todosow, N. Tsoupas *(BNL)*

5:40 p.m.
Compact Accelerator-Based Neutron Source for Bulk Residual Stress Measurements, Tye Gribb *(Phoenix Nucl Labs),* Thad Heltemes *(ANL),* Ross Radel *(Phoenix Nucl Labs)*

Experimental Thermal Hydraulics—II

Sponsored by THD
Session Organizer: Fan-Bill Cheung *(Penn State)*
Cochairs: Si Yong Lee *(SRNL),* Peipei Chen *(SNPTC)*

Castle A/B

4:00 p.m.
Investigation of Flow Laminarization and Heat Transfer Reduction in a VHTR Reactor Core, Francisco I. Valentin, Narbeh Artoun *(City College of New York),* Hitesh Bindra *(KSU),* Masahiro Kawaji *(City College of New York, CUNY Energy Inst)*

4:25 p.m.
Pressurized Startup Transient Analyses for the BWR-TypeNMR-50, Shanbin Shi, Caleb Brooks, Jaehyuk Eoh, Mamoru Ishii *(Purdue Univ)*

4:50 p.m.
Downward-Facing Subcooled Flow Boiling with Extended Surface, Abdul R. Khan, Nejdet Erkan, Koji Okamoto *(Univ of Tokyo)*

5:15 p.m.
Experimental Study of Advanced IVR-ERVC Strategy with Liquid Metal Coolant, Seong Dae Park, In Cheol Bang *(UNIST)*

5:40 p.m.
Development of Optical Fiber Sensors for Use in Sodium Cooled Reactor Instrumentation, Matthew Weathered, Mark Anderson *(Univ of Wisconsin-Madison)*

U.S. NRC Emergency Preparedness and Incident Response

Sponsored by NISD
Session Organizer: Joseph Jones *(SNL)*
Chair: Randolph L. Sullivan *(NRC)*

Castle C

4:00 p.m.
Modeling and Analysis of Manual Intersection Traffic Control for Application in Evacuation Time Estimate Studies, Scott Parr, Brian Wolshon *(LSU)*

4:25 p.m.
Advancements in Evacuation Time Estimate Studies Contribute to Improved Protective Action Strategies, Joe Jones *(SNL),* Randy Sullivan *(NRC),* Brian Wolshon *(LSU)*

4:50 p.m.
Modeling Protective Action Strategies Using MACCS, Fotini Walton *(SNL)*

5:15 p.m.
Hypothetical Risk-Informed and Performance-Based Emergency Preparedness Oversight Regimen, Randy Sullivan *(NRC)*

5:40 p.m.
Real-Time Computation of Evacuation Time Estimates, Kevin Weinisch, Edward Lieberman *(KLD)*

New Nuclear Data Formats and Processing Capabilities

Sponsored by RPD; cosponsored by NCSD
Session Organizer: Brian C. Kiedrowski *(LANL)*
Chair: Jeremy L. Conlin *(LANL)*

Nile

4:00 p.m.
Generalized Nuclear Data (GND), Caleb M. Mattoon, Bret R. Beck *(LLNL)*

4:25 p.m.
Nuclear Data Processing at LANL with NJOY—Past, Present and Future, A. C. Kahler, R. E. MacFarlane *(LANL)*

4:50 p.m.
Processing Needs to Support the New Nuclear Data Format, Bret R. Beck, Caleb M. Mattoon *(LLNL)*

5:15 p.m.
INSURE: An Inverse Sensitivity Uncertainty Quantification Toolkit, Congjian Wang, Bassam A. Khuwaileh, Hany S. Abdel-Khalik *(NCSU),* Goran Arbanas, Mark L. Williams, Michael E. Dunn *(ORNL)*

Core Design Perspective on Accident Tolerant Fuels

Sponsored by RPD
Session Organizer and Chair: Massimiliano Fratoni *(Univ of California, Berkeley)*

Amazon

4:00 p.m.
Systematic Study of a Small, Long-Life HTGR Design for Passive Decay-Heat Removal, Odmaa Sambuu, Toru Obara *(Tokyo Inst. of Technology)*

4:25 p.m.
Neutronic Analysis of Candidate Accident-Tolerant Cladding Concepts in Light Water Reactors, Nathan M. George *(Univ of Tennessee-Knoxville),* Jeffrey J. Powers *(ORNL),* G. Ivan Maldonado, Kurt A. Terrani, Andrew Worrall *(Univ of Tennessee-Knoxville)*

4:50 p.m.
Uranium Nitride Composite Fuels in a Light Water Reactor: Advanced Cladding, Nodal Core Calculations, and Transient Analysis, Nicholas R. Brown, Lap-Yan Cheng, Michael Todosow *(BNL)*

Radiation Protection and Shielding–Roundtable

Sponsored by RPSD
Session Organizer: Peter F. Caracappa *(RPI)*
Chair: Michele Ferenci *(Penn State Univ)*

Wilderness

4:00 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. This session is meant to be fast, informal, and fun.

Decommissioning and Environmental Sciences: General

Sponsored by DESD
Session Organizer and Chair: Eduardo Farfan *(SPSU)*

Western

4:00 p.m.
Rosebud™—A Remotely Operated Submersible Excavator, Richard Engel *(ASI Group)*

4:25 p.m.
Approaches to Decommissioning of Commercial Nuclear Power Plants: Experience Review, Richard Reid, Richard McGrath *(EPRI)*

4:50 p.m.
From Lab to Floor: Advanced Robotics for Flexible Component Assembly, Brian E. O'Neil *(LANL)*

5:15 p.m.
A WBS Application for Dismantling of Nuclear Power Plant, Hee Seoung Park, Seung Kook Park, Chan Ho Song, Jei Kwon Moon *(KAERI)*

5:40 p.m.
ZionSolutions Dry Cask Storage Project/Supporting Fuel Transfer, William J. Szymczak, Frederick N. Williams *(ZionSolutions LLC)*

Human Factors, Instrumentation, and Controls Division—Human Factors: General

Sponsored by HFICD
Session Organizer: Sacit M. Cetiner *(ORNL)*
Chair: Jamie Baalis Coble *(Univ of Tennessee)*

Columbia

4:00 p.m.
Evaluation of Safety Culture Indicators for Korean NPPs, Jungwhan Park, Jonghyun Kim *(KEPCO Intl Nucl Grad School)*

4:25 p.m.
Identification of Human-Induced Initiating Event in the Low and Shutdown Operation by Using CESA Method, Yongchan Kim, Jonghyun Kim *(KEPCO Intl Nucl Grad School)*

4:50 p.m.
Design of Task Support Display for Emergency Operating Procedures using Ecological Interface Design, Munwon Choi, Jonghyun Kim *(KEPCO Intl NuclGrad School)*

5:15 p.m.
Analysis of Inspection Findings in Terms of Safety Culture Components in Korea, Ji Tae Kim, Young Sung Choi *(KINS)*

5:40 p.m.
Elimination of Bias in NPP Control Room Simulator Experiments, Rachel Benish Shirley, Carol Smidts, Atul Gupta, Nan Wang *(Ohio State Univ)*

Deterministic Computational Methods for Radiation Transport and Dosimetry in Physics and Radiation Shielding

Sponsored by CMPWG; cosponsored by BMD, MCD, RPSD
Session Organizer and Chair: Xin Liu *(Missouri Univ of S&T)*

Mississippi

4:00 p.m.

Towards "Virtual" Intra-Operative SPECT or PET Guided Surgery: Advances in Image Reconstruction and Registration Using Deterministic Radiation Transport Simulation, Ian Marsh *(Univ of Wisconsin-Madison, Univ of Wisconsin-La Crosse),* Bryan Bednarz *(Univ of Wisconsin-Madison)*

4:25 p.m.

Deterministic Simulation of Radiation Dose in X-ray Computed Tomography, Edward T. Norris, Xin Liu *(Missouri Univ of Science and Technology)*

4:50 p.m.

Radiation Dose Assessment Based on Voxel Phantom during Reactor Spallation Target Replacement, Ting Li, Tao He, Liqin Hu, FDS Team *(Chinese Academy of Sciences)*

5:15 p.m.

CAD-Based Point Kernel Integral Method for Real-Time Radiation Dose Assessment, Jie Wang, Jing Song, Liqin Hu, FDS Team *(Chinese Academy of Sciences)*

5:40 p.m.

Computer Aided Diagnosis of Oral Cancer: Using Time-Step CT Images, Jonathan T. Scott *(Missouri Univ of Science and Technology)*

Factors Affecting Implementation of Industrial-Scale Used Fuel Recycle in the United States–Panel

Sponsored by FCWMD
Session Organizer: Emory D. Collins *(ORNL)*
Cochairs: Emory D. Collins *(ORNL),* William Burchill *(Ret.)*

Adventure

4:00 p.m.

Various factors that affect the implementation of industrial-scale used fuel recycle will be described and discussed. These include capital funding establishment, site identification and approvals, processing and safeguards technology selection, design and construction, staffing and training, etc. In any case, even if a near-term decision is made, the implementation process requires multiple decades of time, based on worldwide experiences. A major benefit from implementation can be public recognition that the nuclear power industry is being proactive in developing a method for safe and secure disposal of its wastes, and is not relying on continued storage for an indefinite period of time.

Panelists:

- Andrew Sowder *(EPRI)*
- Paul Murray *(AREVA)*
- Steve Nesbit *(Duke Energy)*
- Kent Williams *(Consultant)*
- Bob Bari *(BNL)*
- Emory Collins *(ORNL)*

Nuclear Policy Discussion from ANS Congressional Fellows Perspectives

Sponsored by YMG
Session Organizer and Chair: Harsh S. Desai *(2014 ANS Congressional Fellow to Senator Feinstein)*

Grand Ballroom, North A

4:00 p.m.

The objective of this session is to discuss the ANS Congressional Fellowship experience, the need for public policy engagement on nuclear issues, and highlight career development opportunities in public policy. The panel members will discuss and interact with the audience on their involvement in the nuclear policy efforts, their experience working with policy makers, and the benefits of fellowship experience to their current and future endeavors.

Panelists:

- John F. Kotek *(Gallatin Public Affairs)*–2002 ANS Congressional Fellow
- Timothy E. Valentine, PhD *(ORNL)*–2003 ANS Congressional Fellow
- Eric P. Loewen, PhD *(GE Hitachi Nuclear Energy)*–2005 ANS Congressional Fellow
- Chad J. Boyer *(CB&I)*–2012 ANS Congressional Fellow
- Craig H. Piercy *(ANS Washington Representative)*

Data, Analysis, and Operations for Nuclear Criticality Safety—II

Sponsored by NCSD
Session Organizer: Allison D. Miller *(SNL)*
Chair: Sandra L. Larson *(Nuclear Safety Assoc)*

Grand Ballroom, South A

8:30 a.m.
A Computational Approach to the Dissolver Paradox, Alyssa R. Kersting *(LANL)*

8:55 a.m.
New Critical Experiment Design to Investigate Composite Reflection Effect, C. Percher, S. Kim, D. Heinrichs *(LLNL)*

9:20 a.m.
Nuclear Data Adjustment with SAMMY Based on Integral Experiments, Vladimir Sobes, Luiz Leal, Goran Arbanas *(ORNL)*

9:45 a.m.
Deciphering the Binning Method Uncertainty in Neutron Multiplicity Measurements, Theresa Cutler, Mark Smith-Nelson, Jesson Hutchinson *(LANL)*

10:10 a.m.
Assessment of the Need for a Criticality Accident Alarm System, James S. Baker, Robert Newnam, Steve Kessler, David Erickson *(Savannah River Nuclear Solutions, LLC)*

10:35 a.m.
Fire, Seismic, and other Ex-Process Events and Criticality Safety Risk Acceptance, Shean P. Monahan *(SNL),* T. P. McLaughlin *(Private Consultant),* Mark V. Mitchell, D. K. Hayes *(LANL)*

11:00 a.m.
Mixed Uranium-Plutonium Solution Validation of KENO V. a and KENO-VI in SCALE 6.1.2 and 6.2b3 Using Multigroup and Continuous-Energy ENDF/BVII.0 Libraries, E. L. Jones *(Univ of Tennessee),* W. J. Marshall *(ORNL),* G. I. Maldonado *(Univ of Tennessee, ORNL)*

11:25 a.m.
Characterization of the NPOD3 Detectors in MCNP5 and MCNP6, Kimberly Clark, Jesson Hutchinson, C. J. Solomon, Theresa Cutler, Avneet Sood *(LANL)*

The Innovations in Fuel Cycle Research Awards Program—A Student Competition

Sponsored by ETWDD
Session Organizer: Cathy S. Dixon *(West Texas A & M Univ)*
Chair: Andrew R. Griffith *(DOE)*

Grand Ballroom, South B

8:30 a.m.
A New On-the-Fly Sampling Method at Thermal Energies for Monte Carlo Codes, Andrew T. Pavlou, Wei Ji *(RPI)*

8:55 a.m.
Crack Initiation Behavior of Neutron Irradiated Model and Commercial Stainless Steels in High Temperature Water, Kale J. Stephenson, Gary S. Was *(Univ of Michigan)*

9:20 a.m.
Metal-Organic Framework Materials as Nanostructured Sorbents for the Nuclear Fuel Cycle, Carter W. Abney, Michaël Carboni, Kathryn M. L. Taylor-Pashow, Wenbin Lin *(Univ of Chicago)*

9:45 a.m.
EJ-309 Pulse Shape Discrimination Performance with a High Gamma-Ray-to-Neutron Ratio and Low Threshold, A. C. Kaplan, M. Flaska, A. Enqvist, J. L. Dolan, S. A. Pozzi *(Univ of Michigan)*

10:10 a.m.
Supporting a Thorium-Fueled Reactor Fleet in the U.S. with Domestic By-Product Thorium, Timothy Ault, Steven Krahn, Allen Croff, Raymond Wymer *(Vanderbilt Univ)*

10:35 a.m.
Permeability Analysis of Cement Sealant for Deep Borehole Repositories, Alex Salazar *(Univ of California-Berkeley)*

Operations and Power: General

Sponsored by OPD
Session Organizer: Gale Hauck *(Westinghouse)*
Chair: Richard F. Carpenter *(PPL, SSES, LLC)*

Grand Ballroom, North A

8:30 a.m.
ATMEA1&EPR™ Mode T Core Control Innovative Features for High Operating Flexibility, Alain Grossetete *(AREVA NP SAS)*

8:50 a.m.
The Energy Perspective and Nuclear Role under Global Warming, Hiroshi Ujita, Fengjun Duan *(Canon Instit. for Global Studies)*

9:10 a.m.
Increasing Biomass Feedstocks for Liquid Fuels Using Salt-Cooled Reactors with Air-Brayton Power Cycles, N. C. Skowronski, Charles Forsberg *(MIT)*

9:30 a.m.
The Impact of Energy Storage on Nuclear Electricity Economics, Ryan Tipps, Erich Schneider, Christopher van der Hoeven *(Univ of Texas at Austin),* Charles Forsberg *(MIT)*

9:50 a.m.
Simplified Market Analysis of Nuclear Energy Storage, Ryan Tipps, Erich Schneider, Christopher van der Hoeven *(Univ of Texas at Austin),* Charles Forsberg*(MIT)*

10:10 a.m.
Estimating Evaporation from Spent Fuel Storage Pools Using Tritium, Bruce R. Hugo *(WSU),* Ronald P. Omberg *(PNNL)*

10:30 a.m.

Safety Countermeasure of Onagawa NPS after Great East Japan Earthquake, Akiyoshi Obonai, Takao Watanabe, Kazuo Hirata *(Tohoku Electric Power Company)*

10:50 a.m.

Treatment of Radioactive Contaminants in Off-Gases Using Carbon Supported ETS-10 Nanosorbent, Sachin U. Nandanwar, Kai Coldsnow, Michael Green, Vivek Utgikar *(Univ of Idaho),* Piyush Sabharwall *(INL),* D. Eric Aston *(Univ of Idaho)*

11:10 a.m.

An Air-Brayton Combined Cycle Power Conversion System for Small Modular LMFBRs, Patrick Mc-Daniel, Bahman Zohuri, Cassiano de Oliviera *(Univ of New Mexico)*

Uncertainty Quantification and Sensitivity Analysis Methods

Sponsored by MCD
Session Organizer: Ryan G. McClarren *(Texas A&M)*
Chair: Piero Ravetto *(Politecnico Di Torino)*

Grand Ballroom, North B

8:30 a.m.

Application of the Differential Evolution Adaptive Metropolis (DREAM) Method for Uncertainty Quantification in Inverse Transport Problems, Keith C. Bledsoe *(ORNL),* Jeffrey A. Favorite *(LANL),* Jordan P. Lefebvre, Robert A. Lefebvre, Matthew A. Jessee *(ORNL)*

8:55 a.m.

Sparse-Grid Stochastic Collocation Uncertainty Quantification Convergence for Multigroup Diffusion, Paul W. Talbot, Anil K. Prinja *(Univ of New Mexico)*

9:20 a.m.

Mutual Information: A Generalization of Similarity Indices, Paridhi Athe, Hany Abdel-Khalik *(NCSU)*

9:45 a.m.

Performance Enhancements to the SCALE TSUNAMI-3D Generalized Response Sensitivity Capability, Christopher M. Perfetti, Bradley T. Rearden *(ORNL)*

10:10 a.m.

On the Importance of Second-Order Response Derivatives for Quantifying Non-Gaussian Features of Computed Model Responses, Dan G. Cacuci, Madalina C. Badea *(Univ of South Carolina)*

10:35 a.m.

Efficient and Exact Computation of Second-Order Response Sensitivities Using Adjoint Systems: A Paradigm Illustrative Neutron Diffusion Problem, Dan G. Cacuci *(Univ of South Carolina)*

11:00 a.m.

Further Developments of Inverse Sensitivity/Uncertainty Quantification for High Dimensional-Large Scale Constrained Problems, Bassam A. Khuwaileh, Hany S. Abdel-Khalik *(NCSU)*

Computational Thermal Hydraulics—II

Sponsored by THD
Session Organizer: Igor A. Bolotnov *(NCSU)*
Cochairs: Hisashi Ninokata *(Politecnico Di Milano),* Bao-Wen Yang *(XJTU)*

Monorail A/B

8:30 a.m.

Application of the Entropy Viscosity Method to the1-D7-Equation Model for Two-Phase Flows, Marc O. Delchini, Jean C. Ragusa, Ray A. Berry *(TAMU)*

8:55 a.m.

Thermal Hydraulic Effects of 3-D Power Variations in a PWR Fuel Pin using CFD, Daniel Walter, Victor Petrov, Annalisa Manera *(Univ of Michigan)*

9:20 a.m.

A Multiscale CFD/1D-TH Coupling Overlapping Domain Methodology for Thermal Hydraulic Systems, Timothy P. Grunloh, Annalisa Manera *(Univ of Michigan)*

9:45 a.m.

Emergency Core Cooling System Sensitivity Analysis for a Four-Loop Pressurized Water Reactor with Three Independent Injection Trains, Timothy Crook, Rodolfo Vaghetto, Alessandro Vanni, Yassin A. Hassan *(TAMU)*

10:10 a.m.

Stabilization Techniques for Simulation of High-Aspect Ratio Fluid Structure Interaction (FSI) Models of Flat Plates Under Variable Velocity Parallel Flow, Casey J. Jesse, John C. Kennedy, Gerhard H. Schnieders, Gary L. Solbrekken *(Univ of Missouri)*

10:35 a.m.

Two-Phase Flow Modeling of Steam Direct Contact Condensation as Support of the Fukushima Daiichi Accident Investigation, Marco Pellegrini, Masanori Naitoh *(Inst. of Applied Energy)*

11:00 a.m.

Development of 3D Containment Simulation Capability: High Pressure Steam Blowdown Scenario, Botros Hanna, Nam Dinh, Igor Bolotnov *(NCSU)*

11:25 a.m.

Numerical Study on Single Droplet's Rise in Steam Separator by Using VOF Method, Di Zhang *(Tsinghua Univ, Nuclear Power Inst. of China),* Qi Luo, Wei Huang *(Nuclear Power Inst. of China),* Kan Wang *(Tsinghua Univ)*

Storage and Transportation of Used Nuclear Fuel—I

Sponsored by FCWMD
Session Organizer: John C. Wagner *(ORNL)*
Cochairs: John C. Wagner *(ORNL),* Mark Nutt *(ANL)*

Monorail C

8:30 a.m.
Establishing Technical Basis for Extended Long-Term Storage of Used Fuel, Y. Y. Liu, O. K. Chopra, D. R. Diercks, Z Han, R. R. Fabian *(ANL)*

8:55 a.m.
Consequence Assessment of Fuel Reconfiguration for Dry Storage and Transportation Packages, J. M. Scaglione, G. Radulescu, K. Robb, W. J. Marshall *(ORNL)*

9:20 a.m.
Considerations for Disposition of Dry Cask Storage System Materials at End of Storage System Life, Bretvan den Akker, Rob Howard *(ORNL)*

9:45 a.m.
Integrated Data and Analysis Tool for Used Nuclear Fuel Management, K. Banerjee, J. M. Scaglione, R. A. LeFebvre *(ORNL)*

10:10 a.m.
Guidance for Performing Criticality Analyses of Fuel Storage at Light-Water Reactor Power Plants, K. W. Cummings *(NEI)*

10:35 a.m.
Spent Nuclear Fuel Shipment by Air from Hungary to Russia, Ferenc Gajdos, István Vidovszky *(Hungarian Academy of Sciences),* John Dewes *(SRNL)*

11:00 a.m.
Preliminary Evaluation of Removing Used Nuclear Fuel from Shutdown Sites, Steven J. Maheras, Ralph E. Best, Steven B. Ross, Kenneth A. Buxton *(PNNL),* Jeffery L. England *(SRNL),* Paul E. McConnell *(SNL)*

Experimental Thermal Hydraulics—III

Sponsored by THD
Session Organizer: Theron Marshall *(General Electric)*
Cochairs: Steven A. Arndt *(NRC),* Maria Avramova *(Penn State Univ)*

Castle A/B

8:30 a.m.
Design of a Scaled Experimental Facility for the NGNP Reactor Cavity Cooling System, Thien Nguyen, Victor Petrov, Annalisa Manera *(Univ of Michigan)*

8:55 a.m.
Matched-Index-of-Refraction Flow Facility for Fundamental and Applied Research, Piyush Sabharwall, Carl Stoots, Donald M. McEligot, Richard Skifton, Hugh M. Mcllroy *(INL)*

9:20 a.m.
CCFL of Steam-Condensate Two-Phase Flow in a U-Tube, Takahiro Nozue, Yuki Fujii *(Kobe Univ),* Michio Murase *(Inst. of Nuclear Safety System),* Kosuke Hayashi, Shigeo Hosokawa, Akio Tomiyama *(Kobe Univ)*

9:45 a.m.
A Multi-Purpose Thermal Hydraulic Test Facility for Support of Advanced Reactor Technologies, James E. O'Brien, Piyush Sabharwall, Su-Jong Yoon *(INL)*

Nuclear Installations Safety: General

Sponsored by NISD
Session Organizer: William C. Horak *(BNL)*
Chair: Girja S. Shukla *(NRC)*

Castle C

8:30 a.m.
Preliminary Probabilistic Safety Assessment for a Korean Research Reactor in the Conceptual Design Stage, Yoon-Hwan Lee, Won-Dea Jung, Su-Hyung Yang *(KAERI)*

8:55 a.m.
Offshore Floating Nuclear Plant (OFNP) with Spar-Type Platform Design, Jake Jurewicz, Jacopo Buongiorno, Michael Golay, Neil Todreas *(MIT)*

9:20 a.m.
International Licensing Process and Practices Development-Supporting NPP Licensing as Well as SMRs, Kristiina Söderholm Fortum, Ben Amaba *(IBM)*

9:45 a.m.
Considerations of Water Injection Timing and Volume in Accident Scenarios Relevant to the Fukushima-Daiichi Nuclear Power Plant, Ahmad Al Rashdan, Pavel Tsvetkov, Karen Vierow *(TAMU)*

10:10 a.m.
Extending RISMC Capabilities for Real-Time Diagnostics and Prognostics, Diego Mandelli, Curtis Smith *(INL)*

10:35 a.m.
Preliminary Safety Considerations for the Integral Inherently Safe Light Water Reactor (I2S-LWR), Eric Welch, Annalisa Manera *(Univ of Michigan),* Matt Memmott, Paolo Ferroni *(Westinghouse),* Ming Jun Wang, John C. Lee *(Univ of Michigan)*

Update on Status on Policy Issues in Waste Management–Panel

Sponsored by FCWMD
Session Organizer and Chair: Kathryn D. Huff *(Univ of California, Berkeley)*

Adventure

8:30 a.m.

This session will provide an overview of the changing status of waste management policy in the United States. Recently, longstanding features of the nuclear waste policy landscape have been re-evaluated nationally, such as the nuclear waste fee, potential restart of Yucca Mountain license proceedings at NRC, and NRC progress on the Waste Confidence Generic Environmental Impact Statement (GEIS) and Rule. New strategies are also on the horizon, such as a DOE goal to site a pilot interim storage facility by 2021. This panel discussion will seek to provide an overview of the current landscape related to these and other policy issues related to nuclear waste disposal.

Panelists:

- David Blee *(NIC)*
- Keith McConnell *(NRC)*
- Everett Redmond *(NEI)*
- John Kotek *(Gallatin Public Affairs)*
- Peter Swift *(SNL)*
- Steve Nesbit *(Duke Energy)*

Thorium Fuel Reprocessing and Waste Management

Sponsored by FCWMD
Session Organizer: Steven L. Krahn *(Vanderbilt Univ)*
Chair: Andrew G. Sowder *(EPRI)*

Safari

8:30 a.m.

Impact of Thorium Fuel Processing on Waste Generation Rates, R. T. Jubin *(ORNL),* T. Taiwo *(ANL),* R. Wigeland *(INL)*

8:55 a.m.

Differences in Thorium and Uranium Fuel Reprocessing, Raymond Wymer, Allen Croff, Timothy Ault, Bethany Smith, Steven Krahn *(Vanderbilt Univ)*

9:20 a.m.

An Assessment of the Attractiveness of Material Associated with Thorium Fuel Cycles, Charles G. Bathke, Holly R. Trellue *(LANL),* Bartley B. Ebbinghaus *(LLNL),* Brian A. Collins, Andrew W. Prichard, Brian W. Smith *(PNNL)*

9:45 a.m.

Safeguards Considerations for Thorium Fuel Cycles and Associated Nondestructive Assay Challenges, L. G. Worrall, A. Worrall, S. Croft, R. D. McElroy, A. M. Krichinsky, C. A. Pickett, J. L. White-Horton, J. M. Whitaker *(ORNL)*

10:10 a.m.

Comparative Assessment of Thorium Fuel Cycle Radiotoxicity, Allen G. Croff, Steven L. Krahn *(Vanderbilt Univ)*

10:35 a.m.

Processing of Graphite Based Nuclear Fuels: A Review, G. D. DelCul, B. B. Spencer *(ORNL)*

11:00 a.m.

Thorium Fuel Cycle Pilot Experiences at Oak Ridge National Laboratory, E. D. Collins, B. D. Patton, A. M. Krichinsky, D. F. Williams *(ORNL)*

Reactor Physics Analysis Methods—I

Sponsored by RPD
Session Organizer: Alexander Stanculescu *(INL)*
Chair: David W. Nigg *(INL)*

Nile

8:30 a.m.

Sensitivity/Uncertainty Analysis of Mean Generation Time with Deterministic Codes, Gerardo Aliberti, Micheal A. Smith *(ANL)*

8:55 a.m.

Development of Online Core Monitoring Methodology Applying Periodic 3DPCM for KSNP, Wi-Soo Jeong, Hae-Chan Lee, Hyeong-Seog Kim, Chang-Kue Lee, Sang-Weon Park *(KEPCO)*

9:20 a.m.

Evaluation of Effective Delayed Neutron Fraction Techniques in MC21, Stephanie A. Kempf, Timothy H. Trumbull *(Bechtel Marine Propulsion Corp)*

9:45 a.m.

Intersection Subspace Method for Uncertainty Quantification, Congjian Wang, Jason Hite, Hany S. Abdel-Khalik *(NCSU)*

10:10 a.m.

Modeling an iPWR Startup Core Cycle with VERA, Kelly Kenner *(Univ of Tennessee-Knoxville),* Rose Montgomery *(TVA),* G. Ivan Maldonado *(Univ of Tennessee-Knoxville)*

10:35 a.m.

Estimation of Sensitivity Coefficient Using Random Sampling and L1-Norm Minimization, Tomoaki Watanabe, Tomohiro Endo, Akio Yamamoto *(Nagoya Univ),* Yasuhiro Kodama, Yasunori Ohoka, Tadashi Ushio *(Nuclear Fuel Industries, Ltd.)*

Physics and Engineering Analysis of Sub-Critical Driven Systems—II

Sponsored by RPD; cosponsored by FCWMD, AAD, FED
Session Organizer and Chair: Blair P. Bromley *(Canadian Nuclear Society)*

Amazon

8:30 a.m.

Reactivity Measurements in Subcritical Assemblies Combining MSM and Area Methods, A. Talamo, Y. Gohar *(ANL),* S. Sadovich, H. Kiyavitskaya, V. Bournos, Y. Fokov *(Joint Inst. for Power and Nuclear Research-SOSNY, Minsk)*

8:55 a.m.

Impact of MAs Loading on Transient Characteristics of ADS System, Mingtao He, Liangzhi Cao, Hongchun Wu, Youqi Zheng *(Xi'an Jiaotong Univ)*

9:20 a.m.

Approach-to-Critical with the Idaho State University Sub-Critical Assembly Using the Modified Source Method, Andrew Layne, Chad Pope *(Idaho State Univ)*

9:45 a.m.

Accelerator-Based Neutron Source to Drive Sub-Critical Systems, Ross Radel, Greg Piefer, Evan Sengbusch *(Phoenix Nucl Labs)*

10:10 a.m.

Studies of Gas-Cooled Pressure-Tube Blanket Lattices for Hybrid Fusion-Fission Reactors with Thorium-Based Fuels, Blair P. Bromley *(Canadian Nuclear Society)*

Introduction to the SCALE/MAVRIC Shielding Tools—Tutorial

Sponsored by RPSD
Session Organizer and Chair: Thomas M. Miller *(ORNL)*

Wilderness

8:30 a.m.

This demonstration/tutorial will highlight the automated variance reduction capabilities of the MAVRIC sequence using several simple example shielding problems. To optimize a given tally, MAVRIC first computes an importance map and biased source distribution based on the results of approximate discrete ordinates calculations using the Denovo discrete ordinates code. The importance map and biased source are then used by the Monte Carlo functional module Monaco to compute that tally much more efficiently than an analog calculation. Examples will include: calculating dose near a spent fuel cask, calculating a dose contour map from an array of storage casks, and calculating the doses at the detectors of a criticality accident alarm system. This last example uses a fission distribution computed by KENO-VI as the source term for MAVRIC. Registered SCALE 6.1 users are welcome to bring their own laptop and follow along.

GEANT4–TUTORIAL—I

Sponsored by BMD; cosponsored by MCD, RPSD, CMPWG
Session Organizer: Arzu Alpan *(Westinghouse)*
Chair: Makato Asai *(SLAC National Accelerator Lab)*

Western

8:30 a.m.

General features of the Geant4 toolkit will be covered including an introduction to its design, a discussion of particle transport, geometry and physics options, and GUI and visualization options. The recent implementation of multi-threading and its applications will also be covered, as will advanced topics such as variance reduction techniques and physics customization. This tutorial will be delivered by members of the SLAC Geant4 team in the form of lectures and demonstrations of various aspects of the toolkit.

Nuclear Plant Instrumentation and Control and Human-Machine 2015 (NPIC & HMIT)–Preview Session

Sponsored by HFICD
Session Organizer: H. M. Hashemian *(Analysis & Measurement ServicesCorp.)*
Cochairs: Sacit Cetiner *(ORNL)*, Richard Wood *(ORNL)*

Columbia

8:30 a.m.

The 9th International Conference on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies (NPIC & HMIT) will be held in Charlotte, NC on February 21-26, 2015. The NPIC & HMIT conferences have been the largest and one of the most prestigious organizations in the field of nuclear instrumentation and controls (I&C), and human factors engineering (HFE). This panel intends to provide a snapshot of ongoing research and development activities.

Panelists:

- Hash M. Hashemian *(AMS Corp.)*
- Richard T. Wood *(ORNL)*
- Joseph Naser *(EPRI)*
- Steven A. Arndt *(NRC)*
- Edward L. Quinn *(Technology Resources)*

Nuclear Nonproliferation Technical Group: General—I

Sponsored by NNTG; cosponsored by IRD, NISD, RPSD, YMG
Session Organizer: Chris Robinson *(Y-12 NSC)*
Chair: Rian Bahran *(LANL)*

Mississippi

8:30 a.m.

Comparison of FBR and HFIR Monte-Carlo Simulations with Validation from Gamma Spectroscopy in Support of the NFASP Project, Mathew W. Swinney, Sunil S. Chirayath *(TAMU)*

8:55 a.m.

Evaluation of Hybrid K-Edge Densitometry for Pyroprocessing Material Assay, Matthew T. Cook, Steven E. Skutnik *(Univ of Tennessee)*

9:20 a.m.

Proliferation Resistance Analysis of Nuclear Fuel Cycle Facilities to Quantify the Importance of Containment, Surveillance and Physical Protection Systems, Royal A. Elmore, Sunil S. Chirayath *(TAMU),* Stanislav Edreev *(Tomsk Polytechnic Univ)*

9:45 a.m.

Development of Synthetic Urban Melt Glass for Forensic Analysis, Andrew V. Giminaro, Jerrad P. Auxier, John D. Auxier, Emilie K. Fenske, C. J. Oldham, Matthew T. Cook, Howard L. Hall *(Univ of Tennessee)*

10:10 a.m.

Application of Bayes' Theorem for Pulse Shape Discrimination, Mateusz Monterial *(Univ of Michigan),* Peter Marleau *(SNL),* Alexis Kaplan, Sara Pozzi *(Univ of Michigan)*

10:35 a.m.

Evaluations of LEU Conversion Impact on the High Temperature Experiment Performance at the MIT Reactor, Kaichao Sun, David Carpenter, Lin-wen Hu, Thomas Newton, Jr. *(MIT),* Erik Watson *(ANL)*

Data, Analysis, and Operations for Nuclear Criticality Safety—III

Sponsored by NCSD
Session Organizer: Allison D. Miller *(SNL)*
Chair: Vladimir Sobes *(ORNL)*

Grand Ballroom, South A

1:00 p.m.

Determination of Experimental Correlations Using the Sampler Sequence Within SCALE 6.2, W. J. Marshall, B. T. Rearden *(ORNL)*

1:25 p.m.

Non-Parametric, Extreme-Value Method for Estimating Bias and Bias Uncertainty in Nuclear Criticality Safety, Brian C. Kiedrowski *(LANL)*

1:50 p.m.

Evaluation of Peak Reactivity Analysis of Boiling-Water Reactor Fuel in Transportation and Storage Casks, W. J. Marshall, B. J. Ade, S. M. Bowman *(ORNL)*

2:15 p.m.

Nickel-Reflected Plutonium Metal Sphere Subcritical Measurements, Benoit Richard, Jesson Hutchinson, Theresa Cutler, Avneet Sood, Mark Smith-Nelson *(LANL)*

2:45 p.m.

Validation of keff Calculations for Boiling-Water Reactor Fuel at Peak Reactivity in Transportation and Storage Casks, W. J. Marshall, S. M. Bowman *(ORNL)*

3:10 p.m.

Reconstructing Double-Differential and Energy-Differential Resonance Cross Sections Using the R-Matrix Limited Formalism in the AMPX Code, Andrew Holcomb *(Georgia Tech),* Luiz Leal *(ORNL),* Farzad Rahnema *(Georgia Tech),* Dorothea Wiarda, Goran Arbanas *(ORNL)*

3:35 p.m.

Critical and Subcritical Data for the Revision of ANS 8.12 Standard, Debdas Biswas, Dennis Mennerdahl, Christopher Tripp, Scott Revolinski, Kermit Bunde, Jason Huffer, Michael Shea, Dominic D. Winstanley *(LLNL)*

Education, Training, and Workforce Development: General

Sponsored by ETWDD
Session Organizer and Chair: Sheldon Landsburger *(Univ of Texas at Austin)*

Grand Ballroom, South B

1:00 p.m.

Reactor Laboratory Modules Available at the UMass-Lowell Research Reactor, John R. White *(Univ of Mass-Lowell)*

1:25 p.m.

A 3D, Virtual Research Reactor with Interactive Control Room, Yoshinori Satoh *(Univ of Illinois U-C, Toshiba Co),* Ye Li, Xuefeng Zhu, Rizwan-uddin *(Univ of Illinois U-C)*

1:50 p.m.

A Simple Point Kinetics Model for Operator Training, Bruce R. Hugo *(Energy Northwest, Washington State Univ),* Ronald P. Omberg *(PNNL)*

2:15 p.m.

Educational Training of Handling Naturally Occurring Radioactive Material (NORM) in the Oil and Gas Industry, Shauna G. Landsberger, Graham George *(EPDI),* Sheldon Landsberger *(Univ of Texas at Austin)*

Computational Methods: General—II

Sponsored by MCD
Session Organizer: Ryan G. McClarren *(Texas A&M)*
Chair: Paul Hulse *(Sellafield Ltd.)*

Grand Ballroom, North B

1:00 p.m.
A Comparison of Eigensolvers for the SPN Equations, Steven Hamilton, Tom Evans *(ORNL)*

1:25 p.m.
Monte Carlo Alpha Iteration Algorithm for a Prompt Neutron Decay Constant Calculation, Hyung Jin Shim, Byoung Kyu Jeon, Soo Min Kang, Chang Hyo Kim *(Seoul National Univ)*

1:50 p.m.
Heterogeneous Variational Nodal Method with Continuous Cross Section Distribution in Space, Yunzhao Li, Yongping Wang, Hongchun Wu, Liangzhi Cao *(Xi'an Jiaotong Univ)*

2:15 p.m.
2-D/1-D Method for Neutron Transport Based on Large-Scale Parallel Computation, Wenbin Wu *(Tsinghua Univ, Nuclear Power Inst. of China),* Qing Li *(Nuclear Power Inst. of China),* Kan Wang *(Tsinghua Univ)*

2:40 p.m.
A Numerical Solution to the Point Kinetic Equations Using Spectral Deferred Correction, Yun Cai *(Tsinghua Univ, Nuclear Power Inst. of China),* Qing Li *(Nuclear Power Inst. of China),* Kan Wang *(Tsinghua Univ)*

3:05 p.m.
Development of Sensitivity Analysis Capability in RMC Code, Yishu Qiu, Kan Wang, Jiankai Yu *(Tsinghua Univ)*

Computational Thermal Hydraulics—III

Sponsored by THD
Session Organizer: Fatih Aydogan *(Univ of Idaho)*
Chair: Igor A. Bolotnov *(NCSU)*

Monorail A/B

1:00 p.m.
Multidimensional Modeling of Force Convection Subcooled Boling in Pressurized Water Reactors, Dillon Shaver, Michael Z. Podowski *(RPI)*

1:25 p.m.
Incorporation of MELCOR with CTI's Calvert Cliff's Simulator Product, Robert Sanders *(AREVA),* Barney Panfil *(CORYS Thunder, Inc.)*

1:50 p.m.
Comparison of Two-Temperature Homogenized Model, Harmonic- and Volumetric-Average Thermal Conductivity Models on Transient Analysis of Fully Ceramic Microencapsulated Fuel, Yoonhee Lee, Nam Zin Cho *(KAIST)*

2:15 p.m.
Modeling and Simulation of Solid Fluidization in a Resin Column, Si Y. Lee *(SRNL)*

2:40 p.m.
TRACE Code Calculations of MIT Pressurizer Tests for Review of SPACE Code Capability, Chanyi Song,Young Seok Bang, Andong Shin, Sweng-Wong Woo *(Korea Inst. of Nuclear Safety)*

3:05 p.m.
Optimal Meshing Methods and Schemes for the Simulationo Assembly, Guangliang Chen, Zhijian Zhang, Zhaofei Tian *(Harbin Engineering Univ)*

Storage and Transportation of Used Nuclear Fuel—II

Sponsored by FCWMD
Session Organizer: John C. Wagner *(ORNL)*
Cochairs: John C. Wagner *(ORNL),* Mark Nutt *(ANL)*

Monorail C

1:00 p.m.
Thermal Modeling Capability Development for As-Loaded Commercial Used Nuclear Fuel Casks, Kevin R. Robb, Remy R. Devoe *(ORNL),* Thomas E. Michener *(PNNL),* John M. Scaglione *(ORNL)*

1:25 p.m.
Current DCSS Thermal Analysis for Extended Storage of Spent Nuclear Fuel, Alexander Velazquez-Lozada, Ghani Zigh, Jorge Solis *(NRC)*

1:50 p.m.
Spent Fuel Pool K-Effective Sensitivity to Uniform Neutron Absorber Degradation, Amrit Patel *(NRC)*

2:15 p.m.
Mitigation Potential of Higher Burnup Fuel in Spent Fuel Pools with Uniform Neutron Absorber Degradation, Amrit Patel *(NRC)*

2:40 p.m.
Dry Storage Cask Shake Table Experiments, A. Farghal Maree, David H. Sanders *(Univ of Nevada, Reno)*

3:05 p.m.
A Bayesian Approach to Monitoring Spent Fuel Using Cosmic Ray Muons, S. Chatzidakis, M. Alamaniotis, L. H. Tsoukalas *(Purdue Univ)*

Young Professional Thermal Hydraulics Research Competition

Sponsored by THD; cosponsored by YMG
Session Organizers: Wade R. Marcum *(Oregon State Univ),* Rui Hu *(ANL),* Philippe Bardet *(The George Washington Univ)*
Cochairs: Rui Hu *(ANL),* Philippe Bardet *(The George Washington Univ)*

Castle A/B

1:00 p.m.
On High Order Numerical Schemes for 1-D Fluid Model, Ling Zou, Haihua Zhao, Hongbin Zhang *(INL)*

1:25 p.m.
SFR Duct Wall Temperature Prediction with a Porous Medium Model, Yiqi Yu, Elia Marzari, J. Thomas *(ANL)*

1:50 p.m.
On the Natural Frequency of Fueled Experimental Plates in Air and Water—Experimental Study, P. L. Harmon, Wade R. Marcum, S. Liu, M. Moussaoui, A. Weiss *(Oregon State Univ),* W. F. Jones, N. Woolstenhulme *(INL)*

2:15 p.m.
On the Natural Frequency of Fueled Experimental Plates–Numerical Study, K. Britsch, Wade R. Marcum, T. K. Howard, P. L. Harmon *(Oregon State Univ)*

2:40 p.m.
Development of Bubble Tracking Capability for Level-Set Interface Tracking Method, Jun Fang, Igor A. Bolotnov *(NCSU)*

3:05 p.m.
Modeling Fuel Assemblies on Large Shake Tables, Noah A. Weichselbaum, Morteza Rahimi-Abkenar, Majid Manzari, Philippe M. Bardet *(George Washington Univ)*

3:30 p.m.
A Numerical Approach to Solve Governor Equations of a System Code, Zheng Fu, Fatih Aydogan *(CAES)*

Nuclear Installations Safety: Containment Response and Severe Accidents

Sponsored by NISD
Session Organizer: Edward D. Blandford *(Univ of New Mexico)*
Chair: Diego Mandelli *(INL)*

Castle C

1:00 p.m.
Filtration of Particulates and Pressure Drop in Fibrous Media in Resolution of GSI-191, Amir Ali, Cody Williams, Edward D. Blandford, Kerry Howe *(Univ of New Mexico)*

1:25 p.m.
Fiberglass Calcium Leaching Release Rate Characterization in Post LOCA Conditions, Sterling Olson, Kerry Howe, David Pease, Amir Ali, Daniel LaBrier, Edward D. Blandford *(Univ of New Mexico)*

1:50 p.m.
Resolution of GSI-191: Zinc Chemical Effects During a PWR LOCA Event, David Pease, Kerry Howe, Sterling Olson, Amir Ali, Daniel LaBrier, Edward D.Blandford *(Univ of New Mexico)*

2:15 p.m.
MOCKA Experiments on MCCI of Metal and Oxide Melt with Siliceous Concrete, A. Miassoedov, J. Foit, T. Cron *(KIT)*

2:40 p.m.
Consequences of Degraded Containment in a Severe Nuclear Power Plant Accident, Zachary Jankovsky, Christopher Jones, Donald Kalinich *(SNL)*

3:05 p.m.
Out-Containment Gaseous Iodine Removal Efficiency by Alkaline Spray, Irfan Younus, Man Sung Yim *(KAIST)*

Fuel Cycle and Waste Management: General—I

Sponsored by FCWMD
Session Organizer and Chair: Jean-Francois Lucchini *(LANL)*

Adventure

1:00 p.m.
Why Reconsider a Molten Salt Reactor?, Steven Krahn *(Vanderbilt Univ),* Charles Forsberg *(MIT),* Bethany Smith, Timothy Ault *(Vanderbilt Univ),* Andrew Sowder *(EPRI),* Nick Irvin *(Southern Company)*

1:25 p.m.
Reducing the Molten Salt Reactor (MSR) Accident Source Term, Charles Forsberg *(MIT)*

1:50 p.m.
Burnable Absorber Designs for a Conceptual Boron-Free SMR, Do Ik Chang *(KEPCO),* Hyeong-Heon Kim *(KEPCON E&C),* Kibong Seong, Jin sun Kim *(KEPCO)*

2:15 p.m.
Evaluation of the Reactivity Feedback at Hot Full Power Conditions for Sustainable PWR MOX Fuel Cycle, Alexey I. Soldatov, Taylor N. Coddington, Michael A. Perlin, Andrew C. Klein, Todd S. Palmer *(Oregon State Univ)*

2:40 p.m.
Estimating Worker Collective Doses from a Revised Approach to Managing Commercial Used Nuclear Fuel, Bethany Smith, Steven Krahn, Allen Croff *(Vanderbilt Univ),* Andrew Sowder *(EPRI)*

3:05 p.m.
Fuel Cycle Transition Analysis Under Uncertainty, Urairisa Phathanapirom, Erich Schneider *(Univ of Texas at Austin)*

Promising Thorium Fuel Cycles, Technology Gaps, and Identification of Data Needs to Support Them–Panel

Sponsored by FCWMD
Session Organizer and Chair: Steven L. Krahn *(Vanderbilt Univ)*

Safari

1:00 p.m.

A panel session will be held to consider information from the paper sessions and offer expert views on thorium fuel cycles that appear more (or less) promising; and where thorium fuel cycle data/technology gaps exist, how those data gaps might be filled. The findings which result from this panel should be useful in prioritizing subsequent thorium research and development for any number of relevant organizations. The panel session will also serve as a forum for discussing mechanisms and venues for future information exchanges on thorium fuel cycle options. The panel members will be drawn from a range of interested entities, which include the session chairs, and representatives of present interested organizations.

Panelists:

- Steven Krahn *(Vanderbilt)*
- Jess Gehin *(ORNL)*
- Julian Kelly *(THOR Energy)*
- Luc Van Den Durpel *(AREVA)*
- P. K. Wattal *(BARC)*
- Hongjie Xu *(Shanghai Inst of Applied Physics)*

Reactor Physics Analysis Methods—II

Sponsored by RPD
Session Organizer: Alexander Stanculescu *(INL)*
Chair: Sandra Dulla *(Politecnico Di Torino)*

Nile

1:00 p.m.

Resonance Self-Shielding Method with Resonance Interference Factor Library, Sooyoung Choi, Azamat Khassenov, Deokjung Lee *(UNIST)*

1:25 p.m.

TDKENO: A Hybrid Time-Dependent Transport Analysis Tool, Sedat Goluoglu, Justin Paluch *(Univ of Florida),* Mark DeHart, Sean Morrell *(INL)*

1:50 p.m.

Comparison of Spatial Source Expansion Methods in the Three Dimensional Transport Method LEAF, Yuki Kato, Tomohiro Endo, Akio Yamamoto *(Nagoya Univ)*

2:15 p.m.

Fuel Pin Problem Solution via an Accelerated COMET Method, Kyle Remley, Farzad Rahnema *(Georgia Tech)*

2:40 p.m.

Impact of Improved Experimental Uncertainty Quantification on the Evaluated ^{239}Pu Prompt Fission Neutron Spectrum, Denise Neudecker, Patrick Talou, Toshihiko Kawano *(LANL)*

3:05 p.m.

Improvements to the SP3 Discontinuity Factors in PWR Pin-by-Pin Calculation, Yunzhao Li, Bin Zhang, Hongchun Wu, Liangzhi Cao *(Xi'an Jiaotong Univ)*

Physics of Compact Reactors for Terrestrial and Space Applications

Sponsored by RPD; cosponsored by ANSTD
Session Organizer: John Darrell Bess *(INL)*
Chair: Blair P. Bromley *(Canadian Nuclear Society)*

Amazon

1:00 p.m.

Nuclear Demonstration Test Design for the Kilo Power Space Reactor, Patrick McClure, David Poston *(LANL),* Marc Gibson *(NASA Glenn Research Center)*

1:25 p.m.

Full Submersion Criticality Accident for Low Enriched Uranium Nuclear Thermal Rockets, Paolo Venneri, Yonghee Kim *(KAIST),* Peter Husemeyer, Stephen Howe *(USRA)*

Aerospace Nuclear Science and Technology: General

Sponsored by ANSTD
Session Organizer: Martin B. Sattison *(INL)*
Chair: Wesley R. Deason *(Center for Space Nuclear Research)*

Amazon

1:55 p.m.

A Small Fission Reactor with an Accident-Tolerant Control Drum System for Space Application, Hyun Chul Lee, Tae Young Han, Hong Sik Lim *(KAERI)*

2:20 p.m.

Nuclear Thermal Propulsion with Only Special Nuclear Material of Low Strategic Significance (Category III), Michael Eades, Thomas Blue *(Ohio State Univ),* Leroy Hardin *(NRC)*

2:45 p.m.

Mid-Band Corrosion in Rover/NERVA Fuels: an Acoustic Response to Turbopump Operation and Their Axial Temperature Profile, R. C. O'Brien, P. J. Husemeyer *(INL)*

3:10 p.m.

Multi-Layer Shielding Analysis for an Evaluation of SPE Radiation, S. I. Sriprisan, S. K. Aghara *(Univ of Mass-Lowell)*

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

GEANT4 –Tutorial—II

Sponsored by BMD; cosponsored by MCD, RPSD, CMPWG
Session Organizer: Arzu Alpan *(Westinghouse)*
Chair: Dennis H. Wright *(SLAC National Accelerator Lab)*

Western

1:00 p.m.

General features of the Geant4 toolkit will be covered including an introduction to its design, a discussion of particle transport, geometry and physics options, and GUI and visualization options. The recent implementation of multi-threading and its applications will also be covered, as will advanced topics such as variance reduction techniques and physics customization. This tutorial will be delivered by members of the SLAC Geant4 team in the form of lectures and demonstrations of various aspects of the toolkit.

Nuclear Nonproliferation Technical Group: General—II

Sponsored by NNTG
Session Organizer: Ross Christopher Robinson *(Babcock & Wilcox Y-12)*
Chair: Rian M. Bahran *(LANL)*

Mississippi

1:00 p.m.

Safeguards and Security Integration for Fuel Cycle Facilities, Benjamin B. Cipiti, M. Jordan Parks, Felicia A. Durán *(SNL)*

1:25 p.m.

Effect of Grouping Motivations on State Proliferation Pathways, Meyappan Subbaiah, William S. Charlton, Royal Elmore, Ryan Coogan, David Sweeney *(TAMU)*

1:50 p.m.

A New Approach for the Characterization of Non-Uniqueness of Used Nuclear Fuel Burnup Signatures, Steven E. Skutnik, David R. Davis *(Univ of Tennessee)*

2:15 p.m.

Correlated Neutron and Gamma-Ray Emission in MCNP6, Michael E. Rising, Avneet Sood, Patrick Talou, Ionel Stetcu, Toshihiko Kawano *(LANL)*

ANS Standards Forum

Sponsored by NCSD
Session Organizer: Lon E. Paulson *(GE Hitachi Nuclear)*
Chair: Robert D. Busch *(Univ of New Mexico)*

Grand Ballroom, South A

8:30 a.m.

Speakers to be announced.

Fuel Cycle and Waste Management: General—II

Sponsored by FCWMD
Session Organizer: Jean-Francois Lucchini *(LANL)*
Chair: Jay G. Wellwood *(Westinghouse)*

Adventure

8:30 a.m.

Development of ITER Large Metallic Radioactive Waste Treatment Process, Je Keun Chon *(ITER),* Hugh Allen *(DBD Limited),* Byung-Chan Na *(ITER)*

8:55 a.m.

Separation of $SrCl_2$ and CsCl from Ternary $SrCl_2$-Li-Cl-KCl and Quaternary $SrCl_2$-CsCl-LiCl-KCl Molten Salts via Melt Crystallization, Ammon N. Williams *(VCU),* Michael Pack *(Univ of Idaho),* Supathorn Phongikaroon *(VCU)*

9:20 a.m.

Characterization of Pentavalent and Hexavalent Americiumin Nitric Acid using X-Ray Absorption Fine Structure Spectroscopy and First-Principles Modeling, C. L. Riddle *(INL),* K. Czerwinski, E. Kim *(Univ of Nevada, Las Vegas),* P. D. Paviet *(DOE),* P. F. Weck *(SNL),* F. Poineau *(Univ of Nevada, Las Vegas),* S. Conradson *(LANL)*

9:45 a.m.

On-Line Spectroscopic Monitoring of a Weak-Acid Based Separation Scheme: pH Measurement Variability and Accuracy, Amanda Casella, Laura Hylden, Amanda Crawford, Forrest Heller, Navindra Gunawardena, Sam Bryan *(PNNL)*

10:10 a.m.

Modeling Accumulation of Thermally Fissile Material from Waste Canister Array, Alex Salazar, Joonhong Ahn *(Univ of California-Berkeley)*

Tutorial on Radiation Protection and Shielding in Aeronautics and Space Applications

Sponsored by RPD; cosponsored by ANSTD, RPSD
Session Organizer: Robert C. Singleterry, Jr. *(NASA, Langley)*
Chair: John D. Bess *(INL)*

Amazon

8:30 a.m.

The purpose of this technical session is to give a tutorial on the physics and engineering issues related to radiation protection in shielding in aeronautical (e.g. high-altitude) and space application (including low earth orbit, and interplanetary). This covers background radiation in the space environment, but also radiation that may result from the use of the nuclear power in space reactors and propulsion systems. Discussions of the computational physics tools and methods used for analyzing and designing systems for the protection of equipment and biological organisms (i.e. humans) will be covered. This tutorial should be of particular interest to members of the following divisions: RPSD, ANSTD, RPD, RRSD, IRD, MCD, and BMD.

Panelists:

- Radiation Shielding for Nuclear Thermal Propulsion, Jarvis Caffrey *(NASA MFC)*
- Solar Particle Events and the Radiation Environment at High Altitudes, Hani Al Anid *(PCAire).*
- Radiation Transport Tools for Space Radiation Shielding, Sukesh Aghara *(UMass-Lowell)*
- Galactic Cosmic Radiation Exposure of Aircraft Occupants, Kyle Copeland *(FAA)*

Fellow
presented to
Hashem M. Hashemian

For his leadership, both technical and operational, has enabled Analysis and Measurement Services Corporation to play a key role in ensuring the safe and cost-efficient operation of virtually every U.S. nuclear power plant, as well as many in Europe and Asia, through the development and application of industry-leading instrumentation and control system testing technology.

Fellow
presented to
Ayman I. Hawari

For his development of a novel, accurate, and general approach for describing the phenomenon of neutron thermalization in matter. This approach combined theoretical advances, atomistic simulations, and innovative experiments. The successful development by Prof. Hawari of experimental facilities at the North Carolina State University PULSTAR reactor is due, in part, to the use of the results of this research.

Fellow
presented to
Richard J. Kurtz

For demonstrating research excellence and program leadership for more than three decades leading to significant advances in development of damage tolerant structural materials for nuclear energy applications, including improved nondestructive inspection techniques and evaluation methods to ensure structural integrity.

Fellow
presented to
Arthur T. Motta

For his sustained contributions to the mechanistic understanding the behavior of materials in the nuclear reactor, in the areas of radiation damage, corrosion, hydriding, and mechanical testing. Pioneering and applying new techniques such as synchrotron radiation, to study material microstructure.

Fellow
presented to
David W . Nigg

For his international leadership in various areas of neutron-based radiotherapy for cancer for nearly 25 years. His achievements have included research reactor-based and accelerator-based medical neutron source design, development, construction, and testing as well as computational and experimental radiation dosimetry for radiobiological research to support clinical cancer research worldwide.

Presidential Citation
presented to
Harsh S. Desai

In recognition of his invaluable work as a Congressional Fellow. Since January 2014, Harsh has been legislative Fellow to Senator Dianne Feinstein for Energy and Transportation issues. He has gone above and beyond in his efforts. Harsh's dedication to the position and ANS has been impressive. He has demonstrated diligence in preparing scientific and technical information for Senator Feinstein, and an open willingness to share his knowlege, advice and ideas. Harsh exemplifies the value of the ANS Congressional Fellow Program.

Presidential Citation
presented to
James W. Behrens

In recognition of his consistency and tenacity in volunteer service to the American Nuclear Society. Jim has been a long-standing and active member of ANS, providing consistently high-level support for meeting events, including both the 50th and 75th Anniversaries of the Discovery of Nuclear Fission and 60th Anniversary of the ANS. He has been an invaluable member of the Society and a creative, hardworking contributor to the success of our meetings and programs.

Seaborg Medal
presented to
Charles W. Forsberg

For advancing innovative concepts in the nuclear fuel cycle, high temperature reactors, and applications of nuclear energy towards sustainable hybrid energy systems.

Mary Jane Oestmann Professional Women's Achievement Award

presented to

Shannon M. Bragg-Sitton

For exceptional service and leadership in the Light Water Reactor Sustainability Program, nuclear hybrid energy programs, and North American Young Generation in Nuclear programs.

E. Gail de Planque National Award

presented to

Gail H. Marcus

For significant contributions to the development and implementation of policies and programs relating to nuclear power research and development, regulation, and international collaboration.

Young Member Advancement Award

presented to

W. David Pointer

For his significant contributions toward young members' advancement through his support of students and young professionals involvement in all levels of the Society.

Young Member Excellence Award

presented to

Rachel N. Slaybaugh

For she has demonstrated exemplary leadership and has advanced the field of nuclear engineering with significant contributions to computational neutronics methods, education, and professional service.

Landis Public Communication and Education Award

presented to

Mary Lou Dunzik-Gougar

In recognition of a lifetime of passion and accomplishments in nuclear education and public communication.

Robert L. Long Training Excellence Award

presented to

Charlie Nesbitt

For his visionary leadership as AP1000 Training Deployment Manager at Vogtle 3&4 facilitated the successful Initial Accreditation of Operations Training (2012) & Technical Training (2014) Programs at Vogtle 3&4; the first new nuclear training programs to be accredited in 22 years.

This award will be presented at the upcoming CONTE Conference, 2015.

Eugene P. Wigner Reactor Physicist Award

presented to

Elmer E. Lewis

Professor Lewis pioneered the use of finite elements in neutronics computational methods. He subsequently spearheaded the creation of the variational nodal method, implemented in the widely employed Argonne National Laboratory code VARIANT. Among his more than 200 publications are two widely used textbooks on neutron transport computational methods and reactor physics.

Radiation Science & Technology Award

presented to

Dean J. Mitchell

For his outstanding work in developing the inverse analysis computer code GADRAS for identifying and quantifying the radioisotopes in gamma-ray spectra obtained in cargo and other monitoring applications.

This award was previously presented at an ETWDD function.

Mark Mills Award

presented to

Ahmad Alsabbagh

For his paper titled:
"Microstructure and Mechanical Behavior of Neutron Irradiated Ultrafine Grained Ferritic Steel."

Nuclear Landmark Award

presented to

High Flux Isotope Reactor

For 50 years of operation supporting research and development of the heavy actinides and other isotopes, materials irradiation studies, neutron activation analysis and neutron scattering.

Rockwell Award

presented to

Donald J. Dudziak

For his dedicated over five decades of his life to outstanding research, development, education, and mentoring in the area of radiation shielding and protection and continues to work in the field as a Los Alamos emeritus fellow, an ANS fellow, and as a journal editor.

This award was previously presented at an RPSD function.

Technical Achievement Award

presented to

Jose N. Reyes

In recognition of his exceptional contributions to the understanding of thermal hydraulics phenomena of significance to advanced nuclear reactors and for his impact on the thermal hydraulics community as a researcher, educator, and leader.

ANS Pittsburgh Section

LOCAL SECTIONS MERITORIOUS AWARD

presented to

Pittsburgh Local Section

For small local section best membership, public information, and section management awards.

ANS San Diego Section

LOCAL SECTIONS MERITORIOUS AWARD

presented to

San Diego Local Section

For small local section best meeting and programs award.

ANS Idaho Section

LOCAL SECTIONS MERITORIOUS AWARD

presented to

Idaho Local Section

For large local section best public information award.

ANS Savannah River Section

LOCAL SECTIONS MERITORIOUS AWARD

presented to

Savannah River Local Section

For large local section best membership, meeting and programs, and best section management awards.

Embedded Topical Meeting: *Technology of Fusion Energy (TOFE)*

General Chair:
Brian D. Wirth
University of Tennessee

Technical Program Co-chair:
Vincent Chan
General Atomics

Technical Program Co-chair:
Rajesh Maingi
Princeton Plasma Physics Laboratory

Major Facility Status: Stellarators

Chair: Yeong-Kook Oh *(NFRI)*

Magic Kingdom 3

1:30 p.m.
High Power Heating and Steady State Operation in the Large Helical Device, Takashi Mutoh *(NIFS),* LHD Experiment Group, invited

2:00 p.m.
Status of WEST Construction and Experimental Divertor Program, André Grosman, Jerome Bucalossi, Ph. Ghendrih, Marc Missirlian, Frank Samaille, Emmanuelle Tsitrone *(CEA),* West Project Team, invited

2:30 p.m.
Engineering Challenges of W7-X: Mechanical Instrumentation System for Commissioning and Operation, V. Bykov, K. Egorov, J. Fellinger, F. Schauer, J. P. Kallmeyer, M. Gasparotto *(Max-Planck-Inst für Plasmaphysik)*

2:50 p.m.
Commissioning Strategy of the Wendelstein 7-X Magnet System, Thomas Rummel *(Max Planck Inst for Plasma Physics)*

3:10 p.m.
Analysis of the Wendelstein 7-X Test Divertor Unit Scraper Element With Radiation Shields, Peter H. Titus *(PPPL),* A. Lumsdaine *(ORNL),* W. D. McGinnis *(Max Planck Inst for Plasma Physics),* J. Lore *(ORNL),* H. Neilson, T. Brown *(PPPL),* J. Boscary, A. Peacock *(Max Planck Inst for Plasma Physics)*

Safety and Environmental Impact of Fusion

Cochairs: Lee Cadwallader *(INL),* Laila El-Guebaly *(U Wisc)*

Magic Kingdom 4

1:30 p.m.
The Safety Approach for a European DEMO, Neill P. Taylor, Jane Johnston *(CCFE),* Dario Carloni *(KIT),* invited

2:00 p.m.
Progress and Challenges of Handling Fusion Radioactive Materials, L. El-Guebaly *(Univ of Wisconsin, Madison),* M. Zucchetti *(Politecnico di Torino),* C. D'Angelo *(Univ of Wisconsin, Madison)*

2:30 p.m.
Analysis of Activated Air Following High Yield Shots in the NIF, Hesham Khater, Sandra Brereton (*LLNL)*

2:50 p.m.
Safety Culture and Best Practices at Japan's Fusion Research Facilities, K. Rule *(PPPL),* L. Cadwallader *(INL),* M. King *(General Atomics),* Y. Takase, Y. Oshima *(Univ of Tokyo),* K. Nishimura *(NIFS),* A. Sukegawa *(JAEA)*

3:10 p.m.
Occupational Radiation Exposure (ORE) Dose Rate for U.S. DCLL TBM Replacement/Maintenance and Improving Estimates by 3-D Dose Rate Attila Calculations, Mahmoud Z. Youssef *(UCLA),* Mohamed A. Dagher *(Consultant)*

Major Facility Status: Tokamaks

Chair: Susana Reyes *(LLNL)*

Magic Kingdom 3

4:00 p.m.

NSTX Upgrade for Establishing Physics and Technology Basis for FNSF, Masayuki Ono *(PPPL),* invited

4:30 p.m.

Plasma-Wall Interaction with the ITER Material Mix in the JET Tokamak, Sebastijan Brezinsek *(FzJ),* JET-EFDA Contributors, invited

5:00 p.m.

PPPL ST-FNSF Engineering Design Details, T. Brown, J. Menard *(PPPL),* L. El. Gueblay, A. Davis *(Univ of Wisconsin, Madison)*

5:20 p.m.

Lifetime Extension of a High Power RF Vacuum Tube, S. J. Wukitch, W. Beck, A. Binus, D. Gwinn, A. Kanojia *(MIT),* S. Lenci *(Communication & Power Industries),* Y. Lin, R. Murray *(MIT),* B. Stockwell *(Communication & Power Industries),* D. Terry, R. Vieira, L. Zhou *(MIT)*

5:40 p.m.

Impurity Behavior in Fusion Plasma, Amrita Bhattacharya, Shikha Prasad, Prabhat Munshi *(IITK)*

Materials Development and Modeling—I

Cochairs: Shahram Sharafat *(UCLA),* Patrick Calderoni *(F4E)*

Magic Kingdom 4

3:50 p.m.

EU Progress on High-Heat-Flux Materials and Technology, Gerald Pintsuk *(FzJ),* Michael Rieth *(KIT),* Sehila Gonzalez *(EFDA-Close Support Unit),* invited

4:20 p.m.

Coupled DEM and CFD Models of Helium Purge Gas Thermal Transport in Ceramic Breeder Pebble Beds, Jon Van Thomas, Alice Ying, Mohamed Abdou *(UCLA)*

4:40 p.m.

Vacuum Permeator Analysis for Extraction of Tritium from DCLL Blankets, Paul W. Humrickhouse, Brad J. Merrill *(INL)*

5:00 p.m.

The First Operation of Flinak/LiPb Twin Loop Orosh²i-2 with 3T SC Magnet for Comparative Studies on Liquid Blanket Issues, Akio Sagara, Teruya Tanaka, Juro Yagi *(NIFS),* FERP members

5:20 p.m.

Study of MHD Corrosion of RAFM Steel in Laminar and Turbulent PbLi Flows in a Wall-Normal Magnetic Field, Sheida Saeidi, Sergey Smolentsev, Mohamed Abdou *(UCLA)*

Plenary Session—I, All Invited

Chair: Brian Wirth *(UTK)*

Magic Kingdom 3

8:00 a.m.

Welcome and Introductions, Brian Wirth *(UTK)*

8:05 a.m.

Chinese CFETR Status, Yuanxi Wan *(USTC/IPP),* CFETR Team

8:45 a.m.

Korean Fusion Program Roadmap Toward K-DEMO, G. S. Lee, K. Kim *(NFRI),* Y. S. Hwang, J. H. Han *(Seoul Natl Univ),* H. C. Kim, K. H. Im *(NFRI)*

9:25 a.m.

Ignition Program on the NIF: Status and Future Plans, John Lindl *(LLNL)*

Perspectives on a Fusion Nuclear Science Facility—I, All Invited

Chair: Laila El-Guebaly *(U Wisc)*

Magic Kingdom 3

10:30 a.m.

The Fusion Nuclear Science Facility (FNSF), the Critical Step in the Pathway to Fusion Energy, C. E. Kessel *(PPPL),* J. P. Blanchard, A. Davis, L. El-Guebaly *(Univ of Wisconsin, Madison),* N. M. Ghoniem *(UCLA),* P. W. Humrickhouse *(INL),* A. Khodak *(PPPL),* S. Malang *(Consultant),* B. Merrill *(INL),* N. B. Morley *(LLNL),* F. M. Poli *(PPPL),* M. E. Rensink, T. D. Rognlien *(LLNL),* A. F. Rowcliffe *(Consultant),* S. Smolentsev *(LLNL),* L. L. Snead *(ORNL),* M. S. Tillack *(Univ of California, San Diego),* P. Titus *(PPPL),* L. M. Wagnaer *(Consultant),* A. Ying *(INL),* K. Young *(Consultant),* Y. Zhai *(PPPL)*

10:55 a.m.

Opportunities and Challenges of Compact Fusion Energy, Alan Sykes, Mikhail P. Gryaznevich, David Kingham, Alan E. Costley, Jan Hugill, Colin Windsor *(Tokamak Energy Ltd),* George Smith *(Univ of Oxford),* Peter Buxton *(Univ of York),* Steven Ball, Steve Chappell, Ziad Melhem *(Oxford Instruments),* Garry Voss, John Ross *(Tokamak Energy Ltd),* Bill Huang *(FPGA),* Gideon Hammond *(Tokamak Energy Ltd)*

11:20 a.m.

Research Required to Proceed with the Design of a Fusion Nuclear Science Facility, A. M. Garofalo *(General Atomics)*

11:45 a.m.

Configuration Studies for an ST-Based Fusion Nuclear Science Facility, J. Menard, T. Brown *(PPPL),* J. Canik *(ORNL),* B. Covele *(Univ of Texas, Austin),* L. El-Guebaly *(Univ of Wisconsin, Madison),* S. Gerhardt, S. Kaye, C. Kessel *(PPPL),* M. Kotschenreuther, S. Mahajan *(Univ of Texas, Austin),* R. Maingi *(PPPL),* L. Mynsberge (U*niv of Wisconsin, Madison),* C. Neumeyer, M. Ono *(PPPL),* R. Raman *(Univ of Washington, Seattle),* S. Sabbagh *(Columbia Univ),* V. Soukhanovskii *(LLNL),* P. Valanju *(Univ of Wisconsin, Madison),* R. Woolley, A. Zolfaghari *(PPPL)*

12:10 p.m.

Studies of Nuclear Test Facilities for DEMO in Japan, T. Muroga, A. Sagara *(NIFS),* T. Norimatsu (*Osaka Univ)*

Other MFE and IFE Technology

Cochairs: Larry Baylor *(ORNL),* Wayne Meier *(LLNL)*

Magic Kingdom 4

10:30 a.m.

3D-Printed UST_2 Stellarator Status and First E-Beam Mapping Experiments, Vicente Queral *(CIEMAT)*

10:50 a.m.

Ignitor Siting in the Frame of the IGNIR Collaboration, Massimo Zucchetti *(DENERG, Politecnico di Torino/MIT),* Bruno Coppi *(MIT)*

11:10 a.m.

Fusion Based on the Inductively-Driven Metal Liner Compression of an FRC Plasmoid, John Slough (*MSNW/Univ of Washington),* George Votroubek *(MSNW LLC),* Akihisa Shimazu *(Univ of Washington)*

11:30 a.m.

Characterization of Fusion Reactions in Inertial Electrostatic Confinement Devices at the University of Wisconsin, G. L. Kulcinski, J. F. Santarius, G. A. Emmert, R. L. Bonomo, G. E. Becerra. A. N. Fancher, K. B. Hall, M. J. Jasica, A. M. McEvoy, M. X. Navarro, K. M. Michalak, C. M. Schuff *(Univ of Wisconsin, Madison)*

11:50 a.m.

Linear Induction Accelerator with Magnetic Steering for Target Injection, Ronald Petzoldt, Neil Alexander, Eric Cotner, Robert Kratz *(General Atomics)*

Poster Session—I

Cochairs: Lee Cadwallader *(INL),* Jacob Leachman *(WSU)*

Magic Kingdom 2

ITER Clite Model Comparative Analysis Using Atilla and MCNP, J. Klabacha, R. Feder *(PPPL),* A. Davis, M. Sawan *(Univ of Wisconsin, Madison)*

Development of 3-DOF Platform for High Reliability of CFETR Divertor Remote Maintenance, Wenkong Zhao, Yuntao Song *(Chinese Academy of Sciences),* Huapeng Wu *(Lappeenranta Univ of Technology),* Yong Cheng, Xuebing Peng, Hongtao Pan, Jianghua Wei, Yang Li, Xin Mao (*Chinese Academy of Sciences),* CFETR Design Team

Operation Modes of the ITER in-Tokamak Thermal Shield, H.-S. Chang, R. Maekawa, A. Forgeas, M. Chalifour *(ITER),* D.-S. Park, H.-J. Lee, Y.-M. Park (*NFRI)*

Analysis of ITER Upper Port Diagnostic First Walls, M. Smith, Y. Zhai, G. D. Loesser (*PPPL),* V. Udintsev, T. Giacomin *(ITER),* D. Johnson, A. Khodak, W. Wang, R. Feder, J. Klabacha *(PPPL)*

Final Design of the Generic Upper Port Plug Structure for ITER Diagnostic Systems, Sunil Pak *(NFRI),* Russell Feder *(PPPL),* Thibaud Giacomin, Julio Guirao, Silvia Iglesias, Fabien Josseaume *(ITER),* Douglas Loesser *(PPPL),* Philippe Maquet (*ITER),* Javier Ordieres, Marcos Panizo *(NATEC),* Spencer Pitcher, Mickael Portales *(ITER),* Maxime Proust *(CEA),* Dennis Ronden *(FOM Inst DIFFER),* Arkady Serikov *(KIT),* Alejandro Suarez *(iITER),* Victor Tanchuk (*NIIEFA),* Victor Udintsev, Christian Vacas, Michael Walsh *(ITER)*

Concept Design and Analysis of Water Hydraulic Manipulator for CFETR Blanket Maintenance, Manfen Han *(Univ of Science and Technology of China),* Yuntao Song *(Univ of Science and Technology of China/ Chinese Academy of Sciences),* Yong Cheng, Wenlong Zhao, Xiang Ji *(Chinese Academy of Sciences),* Yafeng Xu *(Anhui Univ of Science and Tech)*

Analysis of Cooling for the ITER ECH Waveguide Transmission Line, Ethan Coffey, Tim Bigelow, Greg Hanson, Arnold Lumsdaine, Claire Luttrell, David Rasmussen, Chuck Schaich *(ORNL)*

Design and Analysis of a 4-DOF Gripper for Maintenance Task in EAST Vacuum Vessel, Hongtao Pan, Yuntao Song *(Chinese Academy of Sciences/Univ of Science and Technology of China),* Yong Cheng, Xuebing Peng, Wenlong Zhao, Jianghua Wei, Yang Li, Yu Zhang *(Chinese Academy of Sciences)*

Distortion of Fuel-Ion Velocity Distribution Functions and Its Effect on Tritium Balance in Thermonuclear Plasmas, H. Matsuura, S. Sugiyama, D. Sawada *(Kyushu Univ),* O. Mitarai *(Tokai Univ)*

Design and Construction of a Coolant Purification System of the HCCR TBM, Eo Hwak Lee, Suk-Kwon Kim, Jae Sung Yoon, Hyung Gon Jin, Dong Won Lee *(KAERI),* Seungyon Cho *(NFRI)*

A New Technique for Inductive Current Drive in Tokamaks Using Permanent Magnet Rotation, A. M. Zolfaghari, J. Matteucci *(PPPL)*

Scaling Pellet Velocities Between LiD and Lexan Sources in an Electrothermal Plasma Pellet Injector Using a 1-D Capillary Code, T. E. Gebhart, A. L. Winfrey *(Virginia Tech)*

DIII-D Neutral Beam Pole Shields Design Including Copper Plate with Removable Molybdenum Insert, A. Khodak, P. Titus, I. Zatz, A. Nagy, J. Winkelman, R. Nazikian *(PPPL),* T. Scoville *(General Atomics)*

Thermal Performance of Multilayer PVD Tungsten Coating for ITER First Wall Panels, Hyunmyung Kim, Ho Jung Lee, Changheui Jang *(KAIST)*

Dynamics for HT and HTO Recovery Through Water Bubbler and CuO Catalyst, Yasuhisa Oya, Misaki Sato, Kenta Yuyama *(Shizuoka Univ),* Masanori Hara, Yuji Hatano, Masao Matsuyama *(Univ of Toyama),* Takumi Chikada (*Shizuoka Univ)*

Effect of Surface Damage on Thermal Reaction of Tungsten Monoblock, Yasufumi Tanaka, Yoshio Ueda, Heun Tae Lee *(Osaka Univ),* Masayoshi Nagata, Yusuke Kikuchi *(Univ of Hyogo),* Satoshi Suzuki, Yohji Seki *(JAEA)*

Helium Release and Surface Morphology Change of Nano-Structures of Various Metals, K. Kanda, K. Uehata, H. T. Lee, Y. Ueda *(Osaka Univ)*

Analysis on Solidified Surface of Melted Toughened, Fine-Grained Recrystallized Tungsten Exposed to TEXTOR Edge Plasma, M. Oya, Y. Ueda (*Osaka Univ),* H. Kurishita *(Tohoku Univ),* J. W. Coenen, A. Kreter *(FzJ)*

Grain Orientation Dependence of Tungsten Surface Modifications Induced by Energetic Particles, Y. Z. Jia, C. Li *(Tsinghua Univ),* H.Y. Xu *(Tsinghua Univ/Science and Technology on Surface Physics and Chemistry Lab),* G. DeTemmerman *(ITER Organization),* H. Greuner *(Max-Planck-Inst for Plasma Physics),* W. Liu *(Tsinghua Univ)*

Impact of Transients on the PFC of DEMO Reactor, B. Bazylev, Yu. Igitkhanov, R. Fetzer *(KIT)*

Transient Electromagnetic Analysis of Blanket Modules 14 and 15 in Different Sectors of the ITER Blanket System Due to Plasma Disruption, J. D. Kotulski, R. S. Coats *(SNL)*

General Overview of the Iter Low Field Side Reflectometer Diagnostic System, A. M. Zolfaghari, H. Zhang *(PPPL),* G. Hanson *(ORNL),* R. Feder, M. Messineo *(PPPL)*

Preliminary Neutronics Analysis of ITER TIP Diagnostic Corner Cube Retroreflectors, K. Tresemer, R. Feder, L. Konkel, J. Klabacha *(PPPL),* R. Wood *(Tech Source)*

Engineering Design of an X-Ray Imaging Crystal Spectrometer for the W7-X Stellarator, M. Mardenfeld *(PPPL),* S. Renard (*Max-Planck-Inst für Plasmaphysik),* N. Pablant *(PPPL),* A. Langenberg (*Max-Planck-Inst für Plasmaphysik),* R. Ellis, Hutch Neilson *(PPPL),* V. Bykov *(Max-Planck-Inst für Plasmaphysik)*

Boiling Heat Transfer Characteristics of a Cryogenic Coolant with Metal Porous Media and Thermal Analysis on a Segmented High-Temperature Superconducting Magnet, Satoshi Ito, Hidetoshi Hashizume *(Tohoku Univ)*

Equation-of-State and Thermodynamic Properties for Warm Dense Hydrogen and Deuterium Plasmas, Mofreh R. Zaghloul *(United Arab Emirates Univ)*

Shallow Liquid Metal Mirror for Ignition Beam of Laser Fusion Power Plant Based on Fast Ignition, Takayoshi Norimatsu *(Osaka Univ),* Oleg Kotyaev, Yoshinori Shimada *(Inst Laser Technol),* Kei Sasaki *(ILE, Osaka Univ),* Shinji Motokoshi *(Inst Laser Technol),* Takahisa Jitsuno, Kohei Yamanoi, Hiroshi Azechi *(ILE, Osaka Univ),* Tomoaki Kunugi *(Kyoto Univ)*

The GAMMA-FR Code Validation Against LOVA Experiments, Hyung Gon Jin, Dong Won Lee, Eo Hwak Lee, Suk Kwon Kim, Jae Sung Yoon *(KAERI),* Seungyon Cho, M-Young Ahn *(NFRI)*

Effect of Interface Between Paint and Concrete Materials in Tritium Permeation, Yuki Edao, Takumi Hayashi *(JAEA),* Satoshi Fukada *(Kyushu Univ)*

Personnel Safety with Pressurized Gas Systems, Lee Cadwallader *(INL)*

Study on the Reliability Analysis of ITER Toroidal Field Superconducting Coils Fast Discharge System, Inho Song, Jun Tao, Sergio Ciattaglia *(ITER)*

Tritium Desorption Behavior from Soil Exposed to Tritiated Water, Kazuya Furuichi, Kazunari Katayama, Hiroyuki Date, Toshiharu Takeishi, Satoshi Fukada (*Kyushu Univ)*

Fundamental Study of Wave Propagation on Liquid Surface Related to IFE Mirror, Yuji Moriyama, Tomoaki Kunugi, Takehiro Yokomine, Zensaku Kawara *(Kyoto Univ.),* Takayoshi Norimatsu *(Osaka Univ)*

LOCA Accident for the DEMO Helium Cooled Blanket, D. Carloni *(KIT),* B. Gonfiottti *(Univ of Pisa),* I. A. Maione *(KIT),* S. Paci *(Univ of Pisa),* L. V. Boccaccini *(KIT)*

Management Scenario for Reduction of Radioactive Waste on a Fusion DEMO Reactor, Y. Someya, K. Tobita, H. Utoh, N. Asakura, Y. Sakamoto, K. Hoshino, M. Nakamura, S. Tokunaga *(JAEA)*

Hydriding Rate Under Helium Blanketing on ZrCo, Ynu Hee Oh, Min Ho Chang, Hyun-Goo Kang, Dong-You Chung, Sei-Hun Yun *(NFRI)*

Quantification of Dominating Factors in Tritium Permeation in PbLi Blankets, Hongjie Zhang, Alice Ying, Mohamed Abdou *(UCLA)*

Tritium Transport Evolutions in HCCR TBM under ITER Inductive Operations, Alice Ying, Hongjie Zhange *(UCLA),* Mu-Young Anh, Youngmin Lee *(NFRI)*

Experiment on Recovery of Hydrogen Isotopes in Fluidized $Li_{17}Pb_{83}$ Blanket, Satoshi Fukada, D. Muneoka, R. Yoshimura, K. Katayama *(Kyushu Univ),* Y. Edao, T. Hayashi *(JAEA)*

Diagnostic Twin Screw Extruder: Initial Measurements of Continuous Ne, H_2, and D_2 Extrusions, J. T. Fisher, J. W. Leachman (*Washington State Univ*)

Direct Delivery of Hydrogen Isotopes from a DU Hydride Bed, Hongsuk Chung *(KAERI),* Sei-Hun Yun *(NFRI)*

Effect of Initial Bed Temperatures and Helium Contents on Hydriding Rates in a Uranium Bed, Daeseo Koo, Hongsuk Chung *(KAERI),* Sei-Hun Yun (*NFRI)*

The Influence of High-Energy Ne Ions Irradiation on Deuterium Permeation and Subsequent Retention of RAMF Steels, Yuping Xu, Feng Liu, Xiaochun Li, Sixiang Zhao, Chonghong Zhang, Guang-Nan Luo *(Chinese Academy of Sciences)*

Fundamental Control Simulation with Efflux Time for Multi-Hydride Bed Battery, Sei-Hun Yun, Min Ho Chang, Hyun-Goo Kang, Dongyou Chung, Yun Hee Oh, Seungyon Cho, Ki Jung Jung *(NFRI),* Hongsuk Chung *(KAERI),* Kyu-Min Song (*KHNP CRI),* Euy Soo Lee *(Dongguk Univ)*

Study on Tritium Supply Scenario for Fusion DEMO Reactor Using High Temperature Gas-Cooled Reactor, Yasuko Kawamoto, H. Nakaya, H. Matsuura, K. Katayama *(Kyushu Univ),* M. Goto, S. Nakagawa *(JAEA)*

UV-Induced Polymerization of Size-Controlled Pt/Poly (SDBTPGDA) Hydrophobic Catalyst Beads in Microfluidics, Jun Wei, Xiang Li, Tong Song, Zi-Fan Song, Zhen-Qi Chang *(Univ of Science and Technology of China),* Christophe A. Serra *(Univ de Strasbourg)*

Present Status of the Design of the European Dual-Coolant Lithium Lead Blanket, I. Fernandez, F. Martin-Fuertes, I. Palermo *(CIEMAT),* E. Mas de Les Valls *(Centre Internacional de Metodes Numerices en Enginyeria/Universitat Politècnica de Catalunya),* C. Moreno, E. Carella, D. Rapisarda *(CIEMAT),* L. Vala, J. Juklicek, O. Frybort *(Research Centre Rez),* A. Ibarra *(CIEMAT),* L. V. Boccaccini *(KIT)*

Preliminary Model of Tritium Migration in DCLL Blanket Concept for DEMO, Carlos Moreno, Iván Fernández *(CIEMAT),* Elisabet Mas de les Vals *(UPC),* Francisco Martin-Fuertes, David Rapisarda *(CIEMAT)*

Advanced Materials Studies for Nuclear Energy, Zhehui Wang, Stuart A. Maloy, Cris W. Barnes, Don J. Rej, C. L. Morris, Kurt F. Schoenberg, Jack S. Shlacter *(LANL),* Houyang Guo (*General Atomics)*

Engineering Study of Tritium Production with High Temperature Gas-Cooled Reactor, Minoru Goto, Shigeaki Nakagawa *(JAEA),* Hideaki Matsuura, Kazunari Katayama *(Kyushu Univ)*

Mechanical Engineering of the ITER ECE Port-Plug Based Components, C. Roman, G. Taylor, J. Hsiao, A. Khodak, C. Hause *(PPPL),* V. Udintsev *(ITER),* R. Feder, D. W. Johnson *(PPPL)*

Dynamic Model Identification of a Hybrid Robot Machine for ITER Vacuum Vessel Assembly and Maintenance Based on Neural Network Using Indirect Error Propagation, Ming Li, Huapeng Wu, Heikki Handroos *(Lappeenranta Univ of Technology)*

Analysis of ITER ECH Transmission Line Waveguide Couplings, Claire Luttrell, Ethan Coffey, Tim Bigelow, Greg Hanson, Arnold Lumsdaine, Alex Melin, David Rasmussen, Chuck Schaich *(ORNL)*

NSTX U Title III Analysis Issues. Peter H. Titus, L. Dudek, M. Smith *(PPPL)*

Perspectives on a Fusion Nuclear Science Facility—II, All Invited

Chair: Charles E. Kessel *(PPPL)*

Magic Kingdom 3

4:00 p.m.
Breeding Potential and Blanket Testing Strategy for FNSF, L. El-Guebaly *(Univ of Wisconsin-Madison),* S. Malang, L. Waganer *(Consultant)*

4:25 p.m.
R&D Needs and Progress Measurement for Liquid Metal Blankets and Systems on the Pathway from Present Experimental Facilities to FNSF, Sergey Smolentsev, Neil B. Morley, Mohamed Abdou *(UCLA)*

4:50 p.m.
Modeling the Thermomechanical Behavior of Plasma-Facing Components in FNSF for Identification of Test Requirements, James Blanchard, Carl Martin *(Univ of Wisconsin, Madison),* Nasr Ghoniem *(UCLA)*

5:15 p.m.
Overview of Fusion Nuclear Technology and Safety Research Activities in China, Yican Wu *(Chinese Academy of Sciences),* FDS Team

5:40 p.m.
Choices for Magnets in the Fusion Nuclear Science Facility, Yuhu Zhai, Peter Titus *(PPPL),* Laila El-Guebaly *(Univ of Wisconsin, Madison),* Charles Kessel *(PPPL)*

Extracting Fusion Power: Tritium and Gas Behavior

Chair: Takeo Muroga *(NIFS)*

Magic Kingdom 4

3:50 p.m.
Fusion Relevant Neutron Sources: Why IFMIF?, J. Knaster, Y. Okumura *(IFMIF/EVEDA Project Team),* invited

4:20 p.m.
High-Heat Flux Facility for High-Throughput Screening of Irradiated Materials for Fusion Applications Using Infrared Plasma Arc Lamps, Adrian Stefan Sabau *(ORNL),* Kazutoshi Tokunaga *(Kyushu Univ),* Jim Kiggans, Charles R. Schaich, Evan K. Ohriner, David C. Harper *(ORNL),* Yoshio Ueda *(Osaka Univ),* Lance L. Snead *(ORNL)*

4:40 p.m.
Neutron Source for Material and Component Tests by Using IFMIF/EVEDA Prototype Accelerator, Takeo Nishitani, Shigeru Ohira, Toshihiko Yamanishi, Masayoshi Sugimoto, Takumi Hayashi *(JAEA)*

5:00 p.m.
An Advanced Materials Irradiation Experimental Construct to Promote Materials Research at the High Flux Isotope Reactor, Nesrin Cetiner, Chris Bryan, David Felde, Young Soo Kwon, Joel McDuffee, Alexander M. Melin, Lance L. Snead, Graydon Yoder *(ORNL)*

5:20 p.m.
Experience Feedback on the Design, Development and Operation of EAST Plasma Facing Components, Xuebing Peng, Yuntao Song, Xiang Ji, Daming Gao, Han Xie, Liman Bao, Tiejun Xu, Lei Cao, Zibo Zhou, Damao Yao, Guangnan Luo, Jiangang Li *(Chinese Academy of Sciences),* EAST Team

5:40 p.m.
Irradiation Effects in Tungsten and Implications for Design Application Beyond ITER, Lance L. Snead, Lauren Garrison, T. S. Byun *(ORNL),* Michael Rieth *(KIT)*

Plenary Session—II, All Invited

Chair: Vincent Chan *(GA)*

Magic Kingdom 3

8:15 a.m.

Welcome and Introductions, Vincent Chan *(General Atomics)*

8:20 a.m.

FED Division Awards, Susana Reyes *(LLNL)*

8:30 a.m.

The Status of ITER, D. Boilson *(ITER)*

9:10 a.m.

The Technology Pathway Towards a Demonstration Fusion Reactor, Gianfranco Federici *(EUROfusion)*

ITER and Future Fusion Experiments—I

Chair: Masayuki Ono *(PPL)*

Magic Kingdom 3

10:20 a.m.

Present Status of Manufacturing and R&Ds for the JT-60SA Tokamak, Satoru Higashijima, Yutake Kamada *(JAEA),* Pietro Barabaschi *(Fusion for Energy),* Shinichi Ishida *(JAEA),* JT-60SA Team, invited

10:50 a.m.

Disruption Mitigation System Developments and Design for ITER, L. R. Baylor, C. Barbier, S. K. Combs, M. N. Erickson, P. W. Fisher, M. S. Lyttle, S. J. Meitner, D. A. Rasmussen, S. F. Smith, J. B. Wilgen *(ORNL),* S. Maruyama, G. Kiss *(ITER)*

11:20 a.m.

Impact of Updated Cross Section Libraries on ITER Neutronics Calculations, Tim D. Bohm, Mohamed E. Sawan *(Univ of Wisconsin, Madison)*

11:40 a.m.

Artificial Neural Network (ANN) Model of the Thermal-Hydraulic Response of a TF Superconducting Magnet in ITER, S. Carli, R. Bonifetto, A. Froio, T. Pomello Lobo, L. Savoldi, R. Zanino *(Politecnico di Torino)*

12:00 p.m.

Effects of Neutron Irradiation on Microstructures and Optical Performance of Multilayered Dielectric Mirrors, N. A. P. Kiran Kumar, K. J. Leonard, G. E. Jellison, L. L. Snead *(ORNL)*

DEMO and Power Plant Studies

Chair: Satoshi Konishi *(Kyoto)*

Magic Kingdom 4

10:20 a.m.

Key Challenges for Developing an Attractive Tokamak Power Plant, Mark S. Tillack *(Univ of California, San Diego),* invited

10:50 a.m.

Fundamental Strategy of DEMO Concept Development in Japan, K. Tobita, Y. Sakamoto, N. Asakura, H. Utoh, Y. Someya, M. Nakamura, K. Hoshino, Hisashi Tanigawa, S. Tokunaga *(JAEA),* invited

11:20 a.m.

Advances in Inertial Fusion Energy Technology: Designing a Chamber for High Rep-Rate Fusion Power, R. M. Hunt, K. J. Kramer, W. Meier, R. Miles, J. DeMuth, P. Rosso, T. P. Anklam, S. Reyes, A. M. Dunne *(LLNL),* R. Sacks, G. Moses *(Univ of Wisconsin, Madison),* invited

11:50 a.m.

DT Fusion Neutron Source for Hybrid Molten Salt Reactor, Robert D. Woolley *(PPPL)*

12:10 p.m.

Dynamic Simulation-Based Case Study of Fusion on Regional Power Systems, Shutaro Takeda, Satoshi Konishi *(Kyoto Univ),* Yasushi Yamamoto *(Kansai Univ),* Ryuta Kasada, Shigeki Sakurai *(Kyoto Univ)*

Poster Session—II

Cochairs: Vincent Chan *(GA),* Rajesh Maingi *(PPPL)*

Magic Kingdom 2

Impact of Focusing Grid Electrodes and Pulsed Power on Modified IEC Fusion Device, Juliusz A. Kruszelnicki, Hendrik Monkhorst, James Baciak, Joseph Mack *(Univ of Florida)*

Optimum Configuration of a Tokamak Neutron Source for Radwaste Transmutation, B. G. Hong *(Chonbuk National Univ)*

High-Yield DD or DT Fusion Neutron Generator, Ross Radel *(Phoenix Nuclear Labs),* Greg Piefer *(SHINE Medical Technologies),* Evan Sengbusch *(Phoenix Nuclear Labs)*

Numerical Analyses of Unsteady Flow Behavior in Flow Conditioner of IFMIF Liquid Lithium Target, S. Gordeev, W. Hering, R. Stieglitz *(KIT)*

Thermo-Mechanical Effects during High-Heat Flux Testing of Plasma Facing Material Specimens Using Infrared Plasma Arc Lamps, Adrian S. Sabau (*ORNL),* Kazutoshi Tokunaga *(Kyushu Univ),* Yoshio Ueda (*Osaka Univ),* Lance L. Snead, Yutai Katoh *(ORNL)*

Characterisation of Laser Driven Deuterium Ions and Their Use for Potential Compact Sources of Neutrons for Applications, J. Fernández (*UPM),* S. Kar, H. Ahmed, D. Doria, D. Gwynne, K. Naughton, F. Hanton *(Queens Univ),* M. Swantusch, M. Cerchez *(Heinrich-Heine-Univ),* H. Powell, D. MacLellan *(Univ of Strathclyde),* M. Borghesi *(Queens Univ),* J. Alvarez, J. M. Perlado *(UPM)*

Applicability of 2-Step N Gettering System to Higher N Concentration for Li Purification of IFMIF Target, Akihiro Suzuki, Takuma Higashi *(Univ of Tokyo),* Juro Yagi *(NIFS),* Takayuki Terai *(Univ of Tokyo)*

Neutronic Analysis of IFMIF High Flux Test Module for High Temperature Irradiation, Takehike Yokomine, Takahide Yoshida, Tomoaki Kunugi *(Kyoto Univ),* Eiichi Wakai *(JAEA)*

Conceptual Layout Design of CFETR Hot Cell Facility, Zheng Gong *(Univ of Science and Technology of China),* Minzhong Qi, Yong Cheng, Yuntao Song *(Chinese Academy of Sciences)*

Design Description for a Coaxial Helicity Injection Plasma Start-up System for a ST-FNSF, R. Raman *(Univ of Washington),* T. Brown *(PPPL),* L. A. El-Guebaly *(Univ of Wisconsin, Madison),* T. R. Jarboe, B. A. Nelson *(Univ of Washington),* J. E. Menard *(PPPL)*

Strength Evaluation of HAZ in Electron Beam Welded ARAA by Small Punch Test for HCCR TBM in ITER, Jae-Sung Yoon, Kyu In Shin, Dong Won Lee, Suk-Kwon Kim, Hyung Gon Jin, Eo Hwak Lee *(KAERI),* Seungyon Cho *(NFRI)*

FEM Modeling of Pebble Bed/Structural Wall Separation, Chunbo (Sam) Zhang, Alice Ying, Mohamed A. Abdou *(UCLA)*

ITER Blanket Shield Block Collaborative Design Within ENOVIA Database, Shuqin Wu *(ITER, China Office),* Weishan Kang *(Southwestern Inst of Physics)*

Tritium Modeling for ITER Test Blanket Module, Iuri Nicolotti *(DENERG - Politecnico di Torino),* Alice Ying *(UCLA),* Massimo Zucchetti *(DENERG - Politecnico di Torino),* Mohamed Abdou *(UCLA)*

Hydrophobic Platinum Honeycomb Catalyst Applicable to Tritium Oxidation Reactor, Yasunori Iwai *(JAEA),* Hitoshi Kubo, Yusuke Ohshima, Hiroshi Noguchi *(Tanaka Kikinzoku Kogyo K. K.),* Yuki Edao *(JAEA),* Junichi Taniuchi *(Tanaka Kikinzoku Kogyo K.K.)*

Recent Achievements in Advanced Neutron Multiplier and Breeder Materials Production, Aniceto Antonio *(KBHF GmbH),* Anton Möslang, Regina Knitter *(KIT),* Sören Müller *(TU-Berlin),* Christopher Dorn *(Materion Brush Inc.)*

Conceptual Design of the DEMO Relevant Liquid Ring Pump Train for JET DTE2, Thomas Giegerich *(KIT),* Nicolas Bekris *(EFDA),* Barry Butler (*CCFE),* Christian Day *(KIT),* Michael Gethins, Sergej Lesnoj *(CCFE),* Ralf Müller, Santiago Ochoa, Peter Pfeil *(KIT),* Robert Smith *(CCFE),* JET-EFDA Contributors

Inspection of the Flow Characteristics of Electrothermal Plasma Discharges Using a Two-Dimensional Fluid Model, M. J. Esmond, A. L. Winfrey *(Virginia Tech)*

Modeling Tritium Breeding Blanket Candidate Design for FNSF, Wen Wu, Vincent Chan, Andrea Garofalo *(General Atomics)*

Evaluation of Physical Properties of the Molten Salt Mixture Flinabe for a Fusion Blanket System Using Molecular Dynamics Simulation, H. Shishido, N. Yusa, H. Hashizume *(Tohoku Univ),* Y. Ishii, N. Ohtori *(Niigata Univ)*

Numerical Investigation of the Effect of the Wall Conductance Ratio on MHD Flow in a Pipe Under a Transverse Non-Uniform Magnetic Field, Gautam Pulugundla, Sergey Smolentsev, Mohamed Abdou *(UCLA)*

Fusion Deployment Scenario Considering Future Energy System with an Innovative Electricity Storage, Satoshi Konishi, Shitaro Takeda (*Kyoto Univ),* Yasushi Yamamoto *(Kansai Univ),* Ryuta Kasada *(Kyoto Univ)*

Preliminary Study on Applying Discrete Ordinates Code Supporting Unstructured Tetrahedral Mesh to the 40-Degree Toroidal Segment ITER Model, Jong Woon Kim, Cheol Woo Lee, Young-Ouk Lee, Dong-Won Lee *(KAERI),* Seungyon Cho *(NFRI)*

Activation Analyses for the RAFM Steel under Development in Korea, Cheol-Woo Lee, Young-Ouk Lee, Dong Won Lee *(KAERI),* Seungyon Cho, Mu-Young Ahn *(NFRI)*

Applicability Study of Hydride Materials for Radiation Shielding in Helical Reactor FFHR-d1, Teruya Tanaka *(NIFS),* Hiroaki Muta *(Osaka Univ),* Yoshimitu Hishinuma, Hitoshi Tamura, Takeo Muroga, Akio Sagara *(NIFS)*

Shutdown Dose Rate Analysis Using the Multi-Step CADIS Method, Ahmad M. Ibrahim, Douglas E. Peplow, Joshua L. Peterson, Robert E. Grove, Seth R. Johnson *(ORNL)*

Performance Test for the Qualification of Korea Heat Load Test Facility, Suk-Kwon Kim, Hyung Gon Jin, Eo Hwak Lee, Jae-Sung Yoon, Dong Won Lee *(KAERI),* Seungyon Cho *(NFRI)*

Hypervapotron Mockup Experiment and Analysis for Application into the Plasma Facing Component, Dong Won Lee, Hyung Gon Jin, Eo Hwak Lee, Jae Sung Yoon, Suk Kwon Kim *(KAERI),* S. Cho *(NFRI)*

Evaluation of Cooling Conditions for a High Heat Flux Testing Facility Based on Plasma-Arc Lamps, Carlos H. Charry, Said I. Abdel-Khalik, Minami Yoda *(Georgia Tech),* Adrian S. Sabau, Lance L. Snead *(ORNL)*

Instrumentation and Analysis of the W7-X Inertially Cooled Test Divertor Unit Scraper Element Design, A. Lumsdaine *(ORNL),* J. Boscary, J. Fellinger *(Max Planck Inst for Plasma Physics),* J. Harris *(ORNL),* H. Höelbe, R. Köenig *(Max Planck Inst for Plasma Physics),* D. McGinnis, J. Lore *(ORNL),* H. Neilson *(PPPL),* A. Peacock *(Max Planck Inst for Plasma Physics),* P. Titus *(PPPL),* J. Tretter *(Max Planck Inst for Plasma Physics)*

DNS of Heat Transfer in an Impinging Round Jet with Confined Wall, S. Satake, H. Ohtsuka, Y. Aoyagi *(Tokyo Univ of Science),* T. Yokomine, T. Kunugi *(Kyoto Univ)*

DNS of MHD Wall Shear Turbulent Flow with Slip-Wall, S. Satake, M. Kimura, S. Saitou *(Tokyo Univ of Science),* T. Kunugi *(Kyoto Univ)*

DNS of Turbulent Heat Transfer in Pipe Flow via the HELIOS Supercomputer System at IFERC-CSC, S. Satake, H. Sawamura, M. Kimura *(Tokyo Univ of Science),* T. Kunugi *(Kyoto Univ)*

Anisotropy of Mechanical Property of Potassium and Rhenium Doped Tungsten Alloys Plate for Fusion Reactor Application, Makoto Fukuda, Shuhei Nogami, Kiyohiro Yabuuchi, Akira Hasegawa *(Tohoku Univ),* Takeo Muroga (*NIFS)*

Effects of Alloying and Dispersion Strengthening on Thermal Stress Distribution of Tungsten Monoblock Divertor, Makoto Fukuda, Shuhei Nogami, Kiyohiro Yabuuchi, Akira Hasegawa *(Tohoku Univ),* Koichiro Ezato, Satoshi Suzuki *(JAEA),* Hitoski Tamura, Takeo Muroga *(NIFS)*

Flow Instabilities in Non-Uniformly Heated Helium Jet Arrays Used for Divertor PFCs, D. L. Youchison *(SNL)*

Influence of Liquid-Lithium on the Near-Threshold Fatigue Crack Behavior of Fusion-Relevant Steels, R. M. Hunt, S. G. Torres, B. Choi, B. El-Dasher, A. M. Dunne *(LLNL)*

Concerns About Lithium Safety and Some Implications for Fusion Components, R. E. Nygren *(SNL)*

Evaluation of Tritium Confinement Performance of Alumina and Zirconium with Tritium Production in a High-Temperature Gas-Cooled Reactor for Fusion Reactors, Kazunari Katayama, Hiroki Ushida, Hideaki Matsuura, Satoshi Fukada *(Kyushu Univ),* Minoru Goto, Shigeaki Nakagawa *(JAEA)*

Various Methods for Al_2O_3, ZrO_2, Ta_2O_5 Coatings as a Tritium Permeation Barrier, Yang-Il Jung, Jeong-Yong Park, Hyun-Gil Kim, Dong-Won Lee *(KAERI),* Se-Hun Kwon *(Pusan National Univ),* Seungyon Cho *(NFRI)*

Mechanical Properties of Dissimilar Metal Weld Joint of F82H and SUS316L Steels, S. Nogami *(Tohoku Univ),* H. Serizawa *(Osaka Univ),* A. Hasegawa *(Tohoku Univ),* T. Nagasaka *(NIFS),* M. Fukuda, K. Yabuuchi *(Tohoku Univ)*

Fatigue Crack Initiation of F82H Reduced Activation Ferritic/Martensitic Steel, S. Nogami, A. Hasegawa, M. Fukuda, K. Yabuuchi *(Tohoku Univ)*

Effect of Helium on Irradiation Creep Behavior of B-Doped F82H Irradiated in HFIR, M. Ando, T. Nozawa, T. Hirose, H. Tanigawa, E. Wakai *(JAEA),* R. E. Stoller, J. Myers *(ORNL*)

Creep Property of a High-Purity Low-Activation Vanadium Alloy NIFS-HEAT-2, T. Nagasaka, T. Tanaka, T. Muroga, A. Sagara *(NIFS)*

Ductile-Phase-Toughened Tungsten for Plasma-Facing Materials, K. H. Cunningham, G. R. Odette, K. Fields, D. Gragg, F. W. Zok *(Univ of California, Santa Barbara),* C. H. Henager, Jr., R. J. Kurtz (*PNNL)*

Pulsed Operation of Glow-Discharge-Driven Inertial Electrostatic Confinement Fusion Device, Kai Masuda, Ryota Nakamatsu, Taiju Kajiwara, Kazuki Inoue *(Kyoto Univ)*

Investigation of Effective Thermal Conductivity for Pebble Beds Based on CFD and DEM Methods for WCCB Blanket of CFETR, Lei Chen, Songlin Liu *(Chinese Academy of Sciences),* Alice Ying *(UCLA),* Kai Huang, Xuebin Ma, Xiaoman Cheng, Kecheng Jiang *(Chinese Academy of Sciences)*

Parallel Operation of Two Compact Inertial Electrostatic Confinement Fusion Devices, H. Osawa, K. Makino, Y. Kawahira, S. Tashima, M. Ohnishi *(Kansai Univ)*

Bridging the Gap Between Celestial Mechanics and Nuclear Fusion: Examining Fusion Confinement Through Tube Dynamics, C. M. Koch, A. L. Winfrey *(Virginia Tech)*

Transmutation Blanket Power Optimization for a Gas Dynamic Mirror, B. Sims, C. K. Choi *(Purdue Univ)*

Viper—A Fusion Propulsion System for a Deep Space Probe, George H. Miley, Drew Ahern, Akshata Krishnamurthy, George Chen *(Univ of Illinois*)

First Wall Materials Effects on Nuclear Criticality Calculations of Fusion-Fission Systems, Carlos Eduardo Velasquez *(Univ Federal de Minas Gerais/FINEP/CNPq),* Claubia Pereira, Maria Auxiliadora F. Veloso, Antonella L. Costa *(Universidade Federal de Minas Gerais/Inst Nacional de Ciencia e Tech de Reatores Nucleares Inovadores/CNPPq/FINEP/CNPq)*

Feasibility Study on Gas Divertor Concept with High Thermal Conductivity Porous Media, Kazuhisa Yuki, Makoto Kawamoto, Munehito Hattori, Koichi Suzuki *(Tokyo Univ Sci)*

Effect of Non-Uniform Deformation on Low Cycle Fatigue Properties of Electron Beam Weld Joint of F82H Steel, S. Nogami, M. Fukuda (*Tohoku Univ),* T. Kato, H. Tanigawa *(JAEA),* A. Hasegawa, K. Yabuuchi *(Tohoku Univ)*

Disruption Analysis of the Proposed KDEMO Inner Blanket Support Structure, Peter H. Titus, H. Neilson, T. Brown *(PPPL),* K. Kim *(NFRI)*

Divertors and PMI Challenge

Chair: Ryan Hunt *(LLNL)*

Magic Kingdom 3

4:00 p.m.

Advanced Divertor Geometries for Power Exhaust in Next Generation Tokamaks, M. Kotschenreuther, S. Mahajan *(Univ of Texas, Austin),* invited

4:30 p.m.

The Present Status and Future Perspective of the Applications of Liquid Metals for Plasma-Facing Components in Magnetic Fusion Power Reactors, Y. Hirooka *(NIFS),* G. Mazzitelli *(ENEA),* S. Mirnov *(TRINITI),* M. Ono *(PPPL),* M. Shimada *(JAEA),* F. L. Tabares *(CIEMAT),* invited

5:00 p.m.

Tungsten Exposed to Multiple Energy Helium Implantation, Lauren M. Garrison *(ORNL),* Gerald L. Kulcinski *(Univ of Wisconsin, Madison)*

5:20 p.m.

HIDRA: Hybrid Illinois Stellarator/Tokamak Device for Research and Applications, D. Andruczyk, D. N. Ruzic, J. P. Allain, D. Curreli *(Univ of Illinois at Urbana - Champaign),* HIDRA Team

5:40 p.m.

Reducing Hydrogen Retention in AOD (Advanced Outer Divertor) in Alcator C-Mod, Sam Pierson, Phil Michael, Atma Kanojia, Rui Vieira, Dave Terry, Soren Harrison, Brian Labombard, Bruce Lipschultz *(MIT)*

Blanket Development, Planning and Testing for ITER

Chair: Mark Tillack *(UCSD)*

Magic Kingdom 4

4:00 p.m.

Status of ITER TBM Program, Satoshi Konishi *(Kyoto Univ),* David Campbell *(ITER),* Maurizio Gasparotto *(Max-Planck-Inst für Plasmaphysik),* Luciano Giancarli *(ITER),* invited

4:30 p.m.

Qualifying Nuclear Weapons Enterprise Legacy Beryllium Metal for ITER, William T. Rogerson, Jr., Sam W. Brown *(Y-12 NSC),* Bradley Nelson *(ORNL),* Robert Hardesty *(Peregrine Falcon Corp.)*

4:50 p.m.

Status of HCLL and HCPB TBM Instrumentation Development, Pattrick Calderoni *(Fusion for Energy)*

5:10 p.m.

Development of Sandwich Flow Channel Inserts for an EU DEMO Dual Coolant Blanket Concept, Prachai Norajitra, Widodo Widjaja Basuki *(KIT),* Maria Gonzalez, David Rapisarda (*CIEMAT),* Magnus Rohde, Luigi Spatafora *(KIT)*

5:30 p.m.

Design and Pre-Test Calculations for Thermal Loading of a Helium-Cooled First Wall Mock-up in the HELOKA Facility, F. Bonelli *(Politecnico di Torino/KIT),* L. V. Boccaccini, B-E. Ghidersa, I. Maione *(KIT),* L. Savoldi, R. Zanino *(Politecnico di Torino)*

Plenary Session—III, All Invited

Chair: Rajesh Maingi *(PPPL)*

Magic Kingdom 3

8:00 a.m.

Welcome and Introductions, Rajesh Maingi *(PPPL)*

8:05 a.m.

Fusion Materials Research and Development Needs, Richard Kurtz *(PNNL)*

8:45 a.m.

Materials Research in Fusion Energy Sciences, Peter J. Pappano *(DOE)*

9:25 a.m.

Overview of the Fusion Engineering in Japan, H. Hashizume *(Tohoku Univ),* T. Nishitani *(JAEA),* S. Konishi *(Kyoto Univ),* Y. Ueda *(Osaka Univ),* S. Fukada *(Kyushu Univ),* A. Sagara *(NIFS)*

ITER and Future Fusion Experiments—II

Cochairs: Jaime Marian *(UCLA),* David N. Hill *(LLNL)*

Magic Kingdom 3

10:30 a.m.

Multi-Physics Engineering Analysis for an Integrated Design of ITER Diagnostic First Wall and Diagnostic Shield Module, Y. Zhai, G. D. Loesser, M. Smith *(PPPL),* V. Udintsev, T. Giacomin *(ITER),* D. Johnson, A. Khodak, W. Wang, R. Feder, J. Klabacha *(PPPL)*

10:50 a.m.

Experimental Study of the Propellant Gas Load Required for Pellet Injection with ITER-Relevant Operating Parameters, S. K. Combs, L. R. Baylor, C. R. Foust *(ORNL),* A. Frattolillo *(ENEA C. R. Frascati),* M. S. Lyttle, S. J. Meitner *(ORNL),* S. Migliori *(ENEA C. R. Frascati)*

11:10 a.m.

Design Description and Current Status of the Tokamak Cooling Water System of ITER, Seokho Kim *(ORNL),* Giovanni Dell Orco *(ITER)*

11:30 a.m.

Numerical Analysis of Coolant Flow and Heat Transfer in ITER Diagnostic First Wall, A. Khodak, G. Loesser, Y. Zhai *(PPPL),* V. Udintsev *(ITER),* J. Klabacha, W. Wang, D. Johnson, R. Feder *(PPPL)*

11:50 a.m.

Energy and Particle Loads on the DEMO Modules of PFC, Yu. Igitkhanov, R. Fetzer, B. Bazylev, L. Boccaccini *(KIT)*

12:10 p.m.

Tritium Transport Analysis in the First Wall of Water Cooled Ceramic Breeder Blanket for CFETR, Kai Huang, Songlin Liu, Guangnan Luo, Xuebin Ma, Lei Cheng, Xiaoman Cheng, Kecheng Jiang *(Chinese Academy of Sciences)*

Materials Test Facilities

Cochairs: Arnold Lumsdaine *(ORNL),* Yoshio Ueda *(Osaka Univ)*

Magic Kingdom 2

10:30 a.m.

Fusion Technology Information from ITER In-Vessel Components Applicable to DEMO and Beyond, A. R. Raffray, F. Escourbiac, J. Fuentes, L. Giancarli, B. Macklin, A. Martin, M. Merola, R. Mitteau, J. Palmer *(ITER),* invited

11:00 a.m.

Research Plan and Initial Results of Japan-U.S. Collaboration Project PHENIX, Yoshio Ueda (*Osaka Univ),* Peter Pappano *(DOE),* Yuji Hatano *(Univ of Toyama),* Takehiko Yokomine *(Kyoto Univ),* Lance Snead *(ORNL),* Richard Nygren *(SNL),* Tatsuya Hinoki *(Kyoto Univ),* Akira Hasegawa *(Tohoku Univ),* Yutai Katoh *(ORNL),* Yasuhisa Oya *(Shizuoka Univ),* Brad Merrill *(INL),* Dean Buchenauer *(SNL),* invited

11:30 a.m.

Effects of Surface Conditions on Hydrogen Plasma-Driven Permeation Through a Ferritic Steel Alloy F82H, Haishan Zhou *(Graduate Univ Advanced Studies),* Yoshi Hirooka, Naoko Ashikawa (*Graduate Univ for Advanced Studies/NIFS)*

11:50 a.m.

Deuterium Retention and Permeation Kinetics in Iron-Irradiated Tungsten, Takumi Chikada, Kenta Yuyama, Misaki Sato, Xiao-Chun Li, Yasuhisa Oya *(Shizuoka Univ)*

12:10 p.m.

Effect of Heat Treatment on Hydrogen Isotope and Helium Retention Behavior for Tungsten and C^+ Implanted Tungsten, Misaki Sato, Kenta Yuyama, Xiao-Chun Li *(Shizuoka Univ),* Naoko Ashikawa, Akio Sagara *(NIFS),* Naoaki Yoshida *(Kyushu Univ),* Takumi Chikada, Yasuhisa Oya (*Shizuoka Univ)*

Divertors and High Heat Flux Components

Chair: Rene Raffray *(ITER)*

Magic Kingdom 3

1:30 p.m.

Wendelstein 7-X Approaches Operation—Review of Construction, Status of Commissioning, and Initial Research Plan, Thomas Klinger *(Max-Planck Inst for Plasma Physics), invited*

2:00 p.m.

EAST Tungsten Monoblock Divetor Development and Experimental Results, G.-N. Luo, D. M. Yao *(Chinese Academy of Sciences),* G. H. Liu *(Advanced Technology & Materials Co.),* F. Ding, L. Cao, Q. Li *(Chinese Academy of Sciences),* S. G. Qin *(Advanced Technology & Materials Co.),* J. Wu, Z. B. Zhou, W. J. Wang, S. X. Zhao *(Chinese Academy of Sciences),* Y. L. Shi *(Advanced Technology & Materials Co.),* Y. Xu, H. M. Mao, T. Xu *(Chinese Academy of Sciences),* T. J. Wang *(Advanced Technology & Materials Co.),* J. G. Li *(Chinese Academy of Sciences),* invited

2:30 p.m.

ARIES-ACT-1 Plasma Disruption Magnetic and Structural Analysis, C. J. Martin J. P. Blanchard *(Univ of Wisconsin, Madison)*

2:50 p.m.

A Numerical Investigation of the Thermal-Hydraulics of the Helium-Cooled Modular Divertor with Multiple Jets, B. Zhao, B. H. Mills, S. I. Abdel-Khalik, M. Yoda *(Georgia Tech)*

3:10 p.m.

An Experimental Study of the Helium-Cooled Modular Divertor with Multiple Jets at Nearly Prototypical Conditions, B. H. Mills, B. Zhao, S. I. Abdel-Khalik, M. Yoda *(Georgia Tech)*

Fuel Cycle and Breeding

Cochairs: Paul Humrickhouse *(INL),* Jacob Leachman *(WSU)*

Magic Kingdom 2

1:30 p.m.

Fusion Exhaust Pumping Systems—Evolution from Experimental Devices to DEMO, Christian Day *(KIT),* invited

2:00 p.m.

A New Hydrogen Processing Development Facility, J. E. Klein, A. S. Poore, X. Xiao, D. W. Babineau *(SRNL)*

2:20 p.m.

Tritium Permeation of Structural Materials for Fusion and Generation IV Very High Temperature Reactors, S. Thomson, K. Pilatzke, K. McCrimmon, I. Castillo, S. Suppiah *(AECL)*

2:40 p.m.

Diagnostic Twin Screw Extruder: Experimental Validation of Numerical Heat Transfer and Flow Models for Ne, H_2, and D_2 Extrusions, J. T. Fisher, J. W. Leachman *(Washington State Univ)*

3:00 p.m.

An Innovative Natural Uranium-Thorium Fueled Fusion-Fission Blanket with Closed Thorium-Uranium Fuel Cycle, S. C. Xiao, Jing Zhao, Z. Zhou *(Tsinghua Univ),* Y. Yang *(Chinese Academy of Sciences)*

3:20 p.m.

Preliminary Studies of Pressure-Tube Blanket Lattices with Thorium-Based Fuels for a Hybrid Fusion-Fission Reactor, Blair P. Bromley *(Canadian Nuclear Society)*

Addressing the PMI Challenge

Chair: Yoshi Hirooka *(NIFS)*

Magic Kingdom 3

4:00 p.m.

Engineering Challenges and Opportunities with Liquid Metal Plasma-Facing Components, M. A. Jaworski *(PPPL)*

4:20 p.m.

Development of Functionally Graded Tungsten/EUROFER97 Coating for First Wall Application, D. D. Qu, W. W. Basuki, J. Gibmeier *(KIT),* R. Vaßen *(FzJ),* J. Aktaa *(KIT)*

4:40 p.m.

Multiphysics Analysis of the Wendelstein 7-X Actively Cooled Divertor Scraper Element, E. Clark *(Univ of Tennessee),* A. Lumsdaine *(ORNL),* J. Boscary *(Max Planck Inst for Plasma Physics),* K. Ekici *(Univ of Tennessee),* J. Harris, D. McGinnis, J. Lore *(ORNL),* A. Peacock, J. Tretter *(Max Planck Inst for Plasma Physics)*

5:00 p.m.

Surface Effects of Exposure of Tungsten to High Heat Flux in the Electrothermal Plasma Source PIPE, J. R. Echols, A. L. Winfrey *(Virginia Polytech Inst & State Univ)*

5:20 p.m.

Effects of Tungsten Melt Layer Motion, Vapor Shielding, and Prompt Re-Deposition to the ELMy H-Mode Operation, Kenzo Ibano, Tee Long Lang, Satoshi Togo, Yuichi Ogawa *(Univ of Tokyo)*

5:40 p.m.

Design, Analysis and Fabrication of a New Magnet Power Supply System for Accelerator-Based In-Situ Materials Surveillance in Alcator C-Mod, Lihua Zhou, Rui Vieira, Jeffrey Doody, William Beck, David Terry, William Cochran, James Irby, Zach Hartwig, Harold Barnard, Brandon Sorbom, Dennis Whyte *(MIT)*

Materials Development and Modeling—II

Cochairs: Yutai Katoh *(ORNL),* Jeffrey Doody *(MIT)*

Magic Kingdom 2

4:00 p.m.

Promises and Challenges for High Temperature Ceramics and Composites as Fusion In-Vessel Component Materials, Yutai Katoh, Lance Snead *(ORNL),* Steve Zinkle *(ORNL/Univ of Tennessee),* Lauren Garrison *(ORNL),* Tatsuo Shikama *(Tohoku Univ),* invited

4:30 p.m.

Dual Ion Irradiation Studies of Reduced Activation Tempered Martensitic Steels and Nanostructured Ferritic Alloys, Takuya Yamamoto, G. Robert Odette, Yuan Wu *(Univ of California, Santa Barbara),* Sokuke Kondo, Akihiko Kimura *(Kyoto Univ)*

4:50 p.m.

Low Temperature Fracture Toughness of 14YWT Nanostructured Ferritic Alloy, M. E. Alam, G. R. Odette, N. J. Cunningham, D. Gragg *(Univ of California, Santa Barbara),* D. T. Hoelzer *(ORNL),* S. A. Maloy *(LANL)*

5:10 p.m.

Analysis of EAST's New Tungsten Divertor and Cooling System During a Disruption with Halo Currents, Jeffrey Doody, Robert Granetz *(MIT),* Damao Yao *(Chinese Academy of Sciences),* William Beck, Lihua Zhou *(MIT),* Zibo Zhou, Lei Cao, Xuan Xiao *(Chinese Academy of Sciences),* Rui Vieira, Stephen Wukitch, Jim Irby *(MIT)*

5:30 p.m.

Fabrication and Characterization of Fe - {110}$Y_2Ti_2O_7$ Mesoscopic Interfaces: Implications to the Development and Optimization of Nanostructured Ferritic Alloys, Tiberiu Stan, Stephan Kraemer, Yuan Wu, G. R. Odette *(Univ of California, Santa Barbara)*

5:50 p.m.

On the Cohesive Strength of Helium-Loaded Grain Boundaries in BCC Fe, Xiaoxun Zhang *(Shanghai Univ of Eng Science),* G. Robert Odette *(Univ of California, Santa Barbara),* Richard J. Kurtz, Fei Gao *(PNNL)*

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ANS

NATIONAL COMMITTEES

Accreditation Policies & Procedures
Sunday, 11 a.m. - 12 p.m.
Location: Nile

Board of Directors
Professional Division Reports
Wednesday, 4 - 5:30 p.m.
Location: Magic Kingdom 1
Board of Directors
Thursday, 8 a.m. - 3 p.m.
Location: Magic Kingdom 1

Bylaws & Rules
Sunday, 4 - 5:30 p.m.
Location: Explorer

Communications
Sunday, 4 - 6 p.m.
Location: Frontier

Finance
Tuesday, 2 - 7 p.m.
Location: Magic Kingdom 1

Honors & Awards
Monday, 4 - 6 p.m.
Location: Columbia

International
Sunday, 11:30 a.m. - 2:30 p.m.
Location: Magic Kingdom 2

Local Section Workshop
Sunday, 8 a.m. - 12 p.m.
Location: Safari

Membership
Sunday, 10 a.m. - 12 p.m.
Location: Monorail C

National Program
NPC Screening
Sunday, 10 a.m. - 12 p.m.
Location: Castle A/B
NPC National Meeting Sub Committee
Wednesday, 11:30 a.m. - 12 p.m.
Location: Congo
NPC Program
Wednesday, 4 - 7 p.m.
Location: Sleeping Beauty

NEED
Sunday, 7:30 - 9:30 p.m.
Location: Tiki

Planning
Sunday, 2 - 4 p.m.
Location: Castle C

President's Meeting w/Committee Chairs
Sunday, 8 - 9 a.m.
Location: Monorail A/B

President's Meeting w/Division Chairs
Sunday, 9 - 10 a.m.
Location: Monorail A/B

Professional Development Coordination
Tuesday, 4 - 5 p.m.
Location: Explorer

Professional Divisions
Committee Meeting
Wednesday, 5:30 - 7 p.m.
Location: Congo
Workshop
Saturday, 5 - 6:30 p.m.
Location: Monorail A/B

Professional Engineering Exam
PEEC Workshop
Saturday, 5 - 10 p.m.
Location: Nile
PEEC Single Reference Development
Sunday, 12:30 - 2:30 p.m.
Location: Magic Kingdom 3
PEEC Committee Meeting
Sunday, 4 - 6 p.m.
Location: Magic Kingdom 2

Professional Women In ANS
Monday, 4 - 6 p.m.
Location: Explorer

Public Policy
Wednesday, 11:30 a.m. - 1:30 p.m.
Location: Explorer

Publications Steering
Meetings, Proceedings & Transactions
Sunday, 9 - 10 a.m.
Location: Explorer
Book Publishing
Sunday, 11 a.m. - 12:30 p.m.
Location: Explorer
Technical Journals
Sunday, 1 - 4 p.m.
Location: Explorer
Nuclear News Editorial Advisory
Sunday, 4 - 5:30 p.m.
Location: Wilderness
Nuclear Technology Advisory
Sunday, 4:30 - 5:30 p.m.
Location: Monorail C
Publications Steering
Monday, 4:30 - 6:30 p.m.
Location: Tiki

Scholarship Policy & Coordination
Monday, 12 - 1 p.m.
Location: Columbia

Student Sections
Executive
Monday, 6 - 7 p.m.
Location: Magic Kingdom 1
Reports
Monday, 7 - 8 p.m.
Location: Magic Kingdom 1
Subcommittee on Retaining Students
Tuesday, 12 - 1 p.m.
Location: Explorer

SPECIAL COMMITTEES

Special Committee on the Congressional Fellow Program
Tuesday, 3:30 - 4:30 p.m.
Location: Congo

Special Committee on Utility Engagement
Tuesday, 9 - 11 a.m.
Location: Explorer

OTHER COMMITTEES

Christian Nuclear Fellowship
Monday, 7 - 10 p.m.
Location: Columbia

Exhibitor Feedback Meeting
Tuesday, 9 - 10 a.m.
Location: Frontier

International Nuclear Societies Council
Tuesday, 4 - 7 p.m.
Location: Frontier

KNS-US Chapter Meeting
Monday, 4:30-6:30 pm
Location: Mississippi Room

NEDHO
Sunday, 4 - 6 p.m.
Location: Adventure

NURETH
Tuesday, 7 - 9 a.m.
Location: Magic Kingdom 1

Pacific Nuclear Council
Sunday, 9 - 11:30 a.m.
Location: Castle C

UWC Planning Committee
Sunday, 1:30 - 2:30 p.m.
Location: Safari

DIVISION COMMITTEES

Accelerator Applications
Executive
Monday, 11:30 a.m. - 1:30 p.m.
Location: Explorer

Aerospace Nuclear Science & Technology
Sunday, 12 - 2 p.m.
Location: Monorail C

Biology & Medicine
Computational Medical Physics Working Group
Sunday, 10 - 11 a.m.
Location: Congo
Committee of the Whole
Sunday, 4 - 5:30 p.m.
Location: Congo

Decommissioning & Environmental Sciences
Program
Sunday, 3:30 - 4:30 p.m.
Location: Castle A/B
Executive
Sunday, 4:30 - 5:30 p.m.
Location: Castle A/B

Education, Training & Workforce Development
Program
Sunday, 10:30 a.m. - 12 p.m.
Location: Adventure
Alpha Nu Sigma National Honor Society
Sunday, 1 - 2 p.m.
Location: Castle C
University/Industry/Government Relations
Sunday, 1:30 - 2 p.m.
Location: Adventure
Executive
Sunday, 2 - 4 p.m.
Location: Adventure

Fuel Cycle & Waste Management
Program
Sunday, 12 - 1 p.m.
Location: Congo
Executive
Sunday, 1 - 2:30 p.m.
Location: Congo
Technical Operating & Standards Committee
Sunday, 2:30 - 3:30 p.m.
Location: Congo

Fusion Energy
Executive
Sunday, 3 - 5 p.m.
Location: Oasis

Human Factors, Instrumentation, & Controls
Program
Sunday, 11 a.m. - 12 p.m.
Location: Zambezi
Executive
Sunday, 12 - 2:30 p.m.
Location: Zambezi

Isotopes & Radiation
Joint Program Committee - I&R/BM
Sunday, 1:30 - 2:30 p.m.
Location: Tiki
Executive
Sunday, 2:30 - 4 p.m.
Location: Tiki

Materials Science & Technology
Executive
Monday, 7 - 9 p.m.
Location: Explorer

Mathematics & Computation
Program
Sunday, 1 - 2:30 p.m.
Location: Frontier
Executive
Sunday, 2:30 - 4 p.m.
Location: Frontier

Nuclear Criticality Safety
Education Meeting
Sunday, 1 - 2 p.m.
Location: Magic Kingdom 4
Program
Sunday, 2 - 3 p.m.
Location: Magic Kingdom 4
Executive
Sunday, 3 - 4:30 p.m.
Location: Magic Kingdom 4

Nuclear Installations Safety
Program
Sunday, 4 - 6 p.m.
Location: Castle C
Executive
Sunday, 7:30 - 9:30 p.m.
Location: Castle C

Nuclear Nonproliferation (TG)
Special Advisory Committee
Sunday, 1:30 - 2:30 p.m.
Location: Nile
Program
Sunday, 2:30 - 3:30 p.m.
Location: Nile
Executive
Sunday, 3:30 - 4:30 p.m.
Location: Nile
NNTG/IRD/FC&WM Integration Meeting
Sunday, 4:30 - 5 p.m.
Location: Nile

Operations & Power
Program
Sunday, 2:30 - 4 p.m.
Location: Safari
Executive
Sunday, 4 - 6 p.m.
Location: Safari

Radiation Protection & Shielding
Joint Benchmark Committee
Sunday, 1 - 2 p.m.
Location: Magic Kingdom 1
Program
Sunday, 2 - 4 p.m.
Location: Magic Kingdom 1
Executive
Sunday, 4 - 6 p.m.
Location: Magic Kingdom 1

Reactor Physics
Honors & Awards
Sunday, 10 - 11 a.m.
Location: Amazon
Goals & Planning
Sunday, 1 - 2 p.m.
Location: Amazon
Program
Sunday, 2 - 4 p.m.
Location: Amazon
Executive
Sunday, 4 - 6 p.m.
Location: Amazon

Robotics & Remote Systems
Executive
Sunday, 12 - 4 p.m.
Location: Wilderness

Thermal Hydraulics
Program
Sunday, 2:30 - 4:30 p.m.
Location: Zambezi
Executive
Sunday, 4:30 - 6 p.m.
Location: Zambezi

Young Members Group (TG)
Executive
Monday, 11:30 a.m. - 1 p.m.
Location: Magic Kingdom 1

STANDARDS COMMITTEES

ANS Standards Board
Tuesday, 9 a.m. - 5 p.m.
Location: Sleeping Beauty

ANS-3.14
Wednesday, 10 a.m. - 12 p.m.
Location: Zambezi

ANS-8.1
Tuesday, 7 - 8:30 a.m.
Location: Explorer

ANS-8.12
Tuesday, 4:30 - 6:30 p.m.
Location: Zambezi

ANS-8.20
Sunday, 9 a.m. - 12 p.m.
Location: Wilderness

ANS-8.23
Monday, 8 a.m. - 12 p.m.
Location: Oasis
Tuesday, 1 - 5 p.m.
Location: Oasis
Thursday, 12 - 5 p.m.
Location: Outpost

ANS - 8.28
Tuesday, 1 - 4 pm
Location: Frontier

ANS-8.3
Monday, 8 - 11 a.m.
Location: Tiki

ANS-10.8
Wednesday, 10 a.m. - 1 p.m.
Location: Oasis
Thursday, 10 a.m. - 1 p.m.
Location: Zambezi

ANS-20.1
Thursday, 8 a.m. – 12:00 p.m.
Location: Tiki

ANS-30.2
Tuesday, 5:30 – 6:30 p.m.
Location: Tiki

ANS-54.1
Wednesday, 8:30 a.m. - 4:30 p.m.
Location: Tiki

ESCC
Wednesday, 8 a.m. - 12 p.m.
Location: Frontier

LLWRCC
Monday, 7:30 a.m. - 2:30 p.m.
Location: Magic Kingdom 2

NCSCC
Monday, 1 - 4 p.m.
Location: Congo

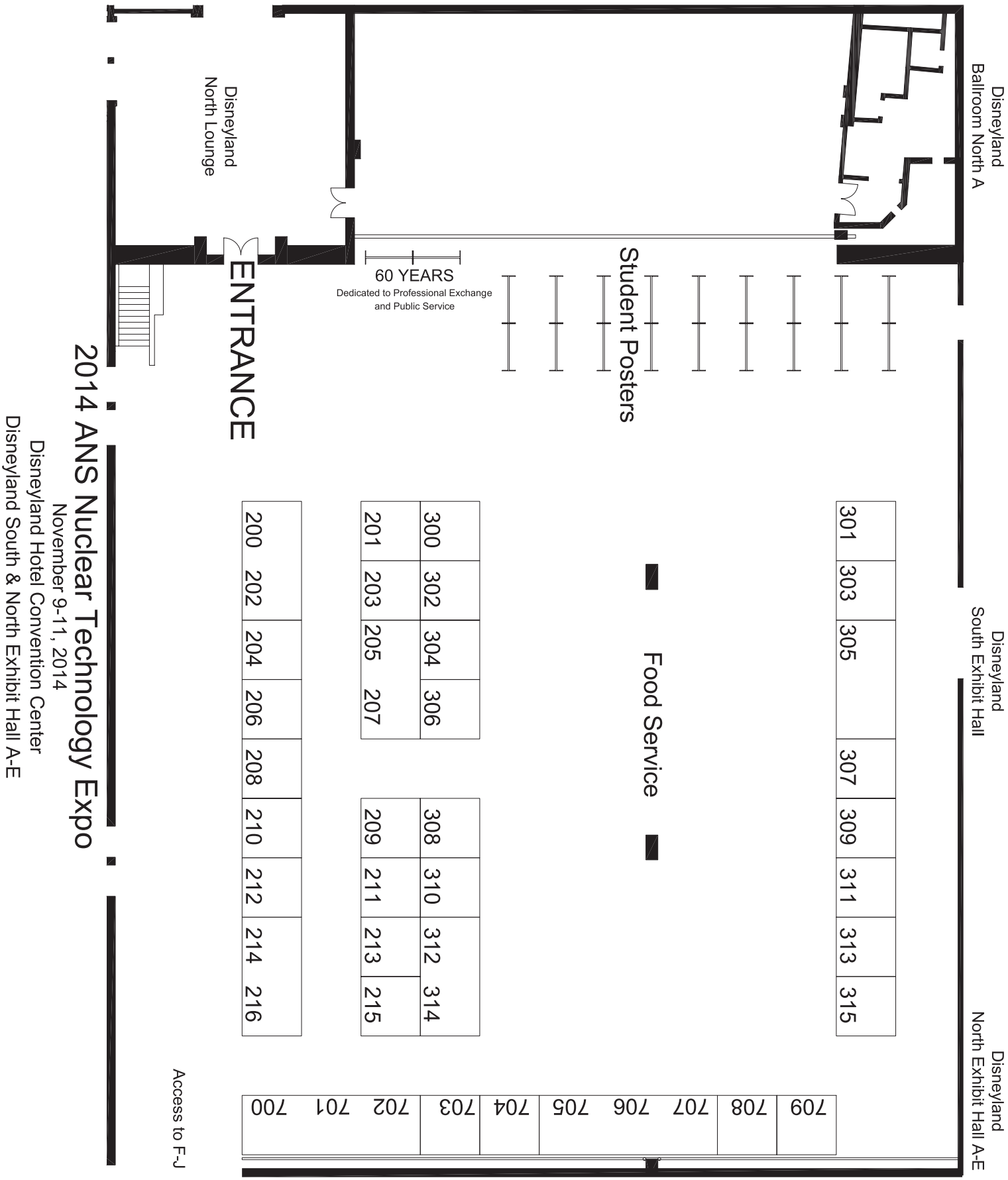
NRNFCC
Wednesday, 8 - 10 a.m.
Location: Zambezi

Policy Task Group
Sunday, 5 -7 p.m.
Location: Tiki

RARCC
Monday, 11 a.m. - 12 p.m.
Location: Congo

Reactor Physics Standards (ANS-19)
Monday, 8:30 - 10:30 a.m.
Location: Columbia

RP3C
Monday, 2:30 - 6 p.m.
Location: Magic Kingdom 2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ENTRANCE
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Disneyland Ballroom North A
60 YEARS
Dedicated to Professional Exchange and Public Service
Student Posters
Food Service
Disneyland South Exhibit Hall
Disneyland North Exhibit Hall A-E
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American Nuclear Society
700, 701, 702

As the premier international society serving nuclear professionals since 1954, the American Nuclear Society (ANS) advocates discovery and progress in nuclear science to benefit humanity. Visit the Society's booth and experience a sampling of the products and services offered. Peruse the books, magazines and journals of ANS Scientific Publications and ANS Magazines. Explore the Center for Nuclear Science and Technology Information and other ANS Outreach initiatives. Update your member profile, place a book order or just chat with ANS staff.

Argonne National Lab
305

Argonne National Laboratory, Argonne, IL

Argonne National Laboratory continues to advance the safe, sustained use of nuclear energy by integrating scientific and engineering breakthroughs in the design and operation of next generation energy systems. Stop by the Argonne booth to learn more and register to win a piece of history – a block of CP-1 graphite!
www.ne.anl.gov

AREVA
200, 202

As a world leader in nuclear power, AREVA in North America (AREVA Inc.) combines U.S. and Canadian leadership to provide utilities with proven expertise and uncompromising dedication to safety in every stage of the nuclear fuel cycle, reactor design and construction, and operating services. AREVA also invests in renewable energies to develop, via partnerships, high technology solutions. Through the complementary nature of nuclear and renewables, AREVA's nearly 5,000 U.S. and Canadian employees contribute to building tomorrow's energy model: Supplying the greatest number of people with energy that is safer and with less CO2.
us.areva.com

ASI Marine
204

ASI Marine offers a full range of services including underwater inspection, commercial diving, and marine geophysical and hydrographic surveys. Our team of expert and experienced divers, engineers, and technicians employ a fleet of advanced remotely operated vehicles (ROV's) equipped with the latest sonar and video imaging, and survey and inspection technologies. For more information contact info@asi-group.com or visit asi-group.com.

ATR National Scientific User Facility (NSUF)
300

The Advanced Test Reactor National Scientific User Facility offers unparalleled opportunities to researchers. ATR NSUF provides its users with no-cost access to world-class nuclear research facilities, technical expertise from experienced scientists and engineers, and assistance with experiment design, assembly, safety analysis and examination. Visit us at the Expo, booth 300, or visit our website (https://atrnsuf@inl.gov)

Ceradyne, Inc., a 3M company
312, 314

Ceradyne, Inc. (formerly Boron Products, LLC) is a leading manufacturer of enriched boron products. Our focus is on nuclear reactor sustainability by manufacturing optimized materials with emphasis on proprietary stable boron isotopes for criticality control in nuclear power operations, nuclear fuel management and control, and waste management technologies.
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COH Inc. - REEL
201

COH, Inc. part of the REEL Group with REEL SAS and NKMNOELL Special Cranes GmbH, designs, manufactures and services custom design High Safety Overhead Handling Equipment needed in the Nuclear Industry such as Fuel Handling Systems, Reactor Building, Turbine Hall Cranes – Gantry & EOT Cranes – Remote handling Devices for Hot Cells, plus also Internals for RPV, Underwater Storage Racks, Containers and casks for nuclear fuel and waste.
www.coh.ca

Doosan HF Controls Corporation
311

Doosan HF Controls, headquartered in Carrollton Texas USA, is an I&C solutions provider that has supplied and serviced Instrumentation and Control (I&C) systems to American and International clients for over 50 years across the fossil and nuclear markets. Doosan HF Controls has become a major nuclear supplier as it expands its business portfolio.
http://www.hfcontrols.com
John A. Stevens
Doosan HF Controls Corp.
1624 W. Crosby Road - #124, Carrollton, TX 75006
Phone 469.568.6556 • Cell 214.455.7204
Email: john.stevens@doosan.com
Web Site: http://www.hfcontrols.com

EXCEL Services Corporation
705, 706, 707

EXCEL Services Corporation, Rockville, MD
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www.excelservices.com
Donald R. Hoffman – President/CEO
donaldh@excelservices.com
301.984.4400

FNC Technology Co., Ltd.
211

FNC Technology Co.,Ltd. (FNC) is a growing engineering company on a fast track with bold visions to provide technical services and engineering solutions of the highest level for the Korean nuclear society and beyond. FNC has achieved the professionalism and built up experience to play an important role as the Korean premier nuclear engineering company to provide engineering solutions of high quality. www.fnctech.com
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Forum on Energy, A Project of The Howard Baker Forum
208

The Howard Baker Forum was founded by former Senator Howard Baker in Washington, D.C. to provide a platform for examining critical issues affecting the nation's progress at home and its relations abroad. Through the U.S. - Japan Roundtable on Nuclear Energy Cooperation and Forum on Energy, The Forum enhances cooperation and improves public understanding of nuclear energy. http://www.howardbakerforum.org/
The Howard Baker Forum
Washington, D.C.
Howardbakerforum.org
Holly Keller
Business Manager
Holly.keller@howardbakerforum.org

Goodnight Consulting
709

Goodnight Consulting is a management consulting firm who serves the global electric power industry with a concentration on nuclear clients. We identify risks and uncover opportunities at the intersection of labor and technology. Our key services include:

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- Organizational Realignment
- Cultural Assessments
- Process Evaluation & Redesign
- HR Services

IAEA Careers
203

IAEA Careers, Argonne, IL
The International Atomic Energy Agency (IAEA) in Vienna, Austria is the world's center for cooperation in the nuclear field committed to promoting safe, secure and peaceful uses of nuclear technology. IAEA offers opportunities to engage current, meaningful issues of global peace, security and development while working in a multicultural workplace. https://international.anl.gov

IBM
213

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Innovative Systems Software
704

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Innovative Systems Software
3585Briar Creek Ln
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iRobot Corporation
310

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ITD USA, Knoxville, TN
313

The ITD USA Inc. has activities in this special market of nuclear technical equipment and installation. Our main customers are the manufacturers and users of radioactive material as sealed sources, radiochemicals and radiopharmaceuticals. Our main production programs are single cell or cell rows with special incell-equipment. Master-Slave Manipulators realized the remote controlled handling of objects and tools in these cells. We have an experienced staff that guarantees the highest quality of our products Customer specific innovative product solutions and a product related personnel training are in our service range. www.itd-usa.com

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210

Klein Steel is a NY-based, NQA-1 compliant, metals service center serving customers worldwide. Klein Steel offers a full range of services including commercial grade dedication, supply chain management, processing, kitting and component manufacturing. Named a 2014 finalist for AMM Service Center of the Year, Klein Steel is acknowledged as an innovator and industry leader. Klein Steel also received the IndustryWeek Best Plants award in 2011, the Rochester Business Ethics Award in 2012 and has been named to the Rochester Top 100 15 times over the past 19 years.
www.kleinsteel.com
For further information, please contact Jim Doran: jdoran@kleinsteel.com or 585-739-9484.

Lockheed Martin
301

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Mitsubishi Electric Power Products
209

Mitsubishi Electric Corporation (MELCO) is a world leader in designing, manufacturing and implementing advanced nuclear power plant control solutions, with more than 30 years of experience and plant-wide digital control systems installed in over twenty operating nuclear power reactors worldwide. www.meppi.com/nuclear
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Nuclear Applications Company, Oceanside, CA
215

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Nuclear Energy University Program (NEUP)
302

Nuclear Energy University Programs funds nuclear research and equipment upgrades at U. S. colleges and universities, and student educational support. NEUP is helping the Department of Energy accomplish its mission of leading the nation's investment in the development and exploration of advanced nuclear science and technology.
www.neup.gov

Nuclear Plant Journal
306

Nuclear Plant Journal, a US publication now in its 32nd year, provides technical information exchange among managers and engineers in nuclear power industry worldwide. Circulation is 12,000 (BPA Worldwide audited). The Journal is published six-times per year and reaches every country in the world with a civilian nuclear energy program. The Journal is published in digital as well as printed version. The Products & Services Directory is published yearly in December
Online: NuclearPlantJournal.com;
facebook.com/nuclearplantjournal;
youtube.com/user/nuclearplantjournal;
twitter.com/npjtweet. Representative: Anu Agnihotri.

Nuclear Science and Security Consortium (NSSC) • University of California, Berkeley
303

The Nuclear Science and Security Consortium (NSSC) is a network of universities and national laboratories, which trains students in relevant nuclear disciplines in preparation for research and leadership roles in the national laboratories. NSSC's collaborative approach replaces the boundaries that separate disciplines with a more inclusive Science-Technology-Policy interface.
nssc.berkeley.edu

Nuclear Three Inc.
304

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Nuclear Three Inc. has served nuclear energy since 1965. We offer reactor operations reviews, strategic planning, temporary executive support at CNO and CEO levels. Also we serve as an advisor to the financial industry on investment risk assessment for nuclear energy.
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Oak Ridge National Laboratory
205, 207

Oak Ridge National Laboratory, Oak Ridge, TN
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www.ornl.gov

Presray Corporation
212

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www.presray.com

RadiaBeam Systems, Santa Monica, CA
703

RadiaBeam Systems provides a wide range of electronic isotope replacements, high-power electron and X-ray linacs, and radiography sources. Our custom engineered and fabricated turnkey accelerator systems are suited for the next generation of applications in the nuclear, energy, security and industrial sectors. Visit us at booth 703 or www.radiabeamsystems.com for more information.

Sarens Group
308

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Point of contact: Steve Kenney
Sarens USA, Inc.
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510-865-2400

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315

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University of Maryland • A. James Clark School of Engineering
309

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Contact information:
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Tel: 301-405-7200

University of Pittsburgh • Swanson School of Engineering
708

University of Pittsburgh Swanson School of Engineering Graduate Programs in Nuclear Engineering (available via distance learning)

Pitt's Master of Science (MS) and Graduate Certificate in nuclear engineering programs include coursework in nuclear operations and safety, nuclear science, and nuclear systems and policy. Students are working professionals, who "attend" class remotely in real time via the Internet (with full interaction). They also may view lectures in archived form. http://www.engineering.pitt.edu/nuclear/

Janet L. Littrell, Director of Distance Learning, Swanson School of Engineering, University of Pittsburgh
412-383-7027 (phone)
Jll119@pitt.edu
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Varian Security & Inspection Products
206

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Contact Information:
Name: Greg Failla
Phone: 253.857.1056 x101
Email: Gregory.Failla@varian.com
Web: www.varian.co m

Virginia Tech Nuclear Engineering Program
Booth 307

The Virginia Tech Nuclear Engineering Program offers graduate degrees through the Department of Mechanical Engineering, which is consistently ranked in the top 10% of Mechanical departments nationally. Research opportunities are available in the traditional sub-disciplines associated with fission power, and in nuclear materials, nuclear medicine, fusion engineering, and plasma science.
www.nuclear.ncr.vt.edu

Westinghouse Electric Company
214, 216

Westinghouse Electric Company offers a wide range of nuclear plant products and services to utilities throughout the world, including fuel, spent fuel management, service and maintenance, instrumentation and control, and advanced nuclear plant designs, including the Generation III+ AP1000 nuclear power plant.

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www.westinghousenuclear.com

ANS Organization Membership

The American Nuclear Society salutes our Organization Members* as aiding in our mission to promote nuclear science and technology to benefit humanity.

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American Electric Power Service Corp.

American Nuclear Insurers

AREVA

Arizona Public Service Co.

ATC Nuclear

Atomic Energy of Canada, Ltd. (AECL)

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Varian Security & Inspection Products

Westinghouse Electric Co., LLC

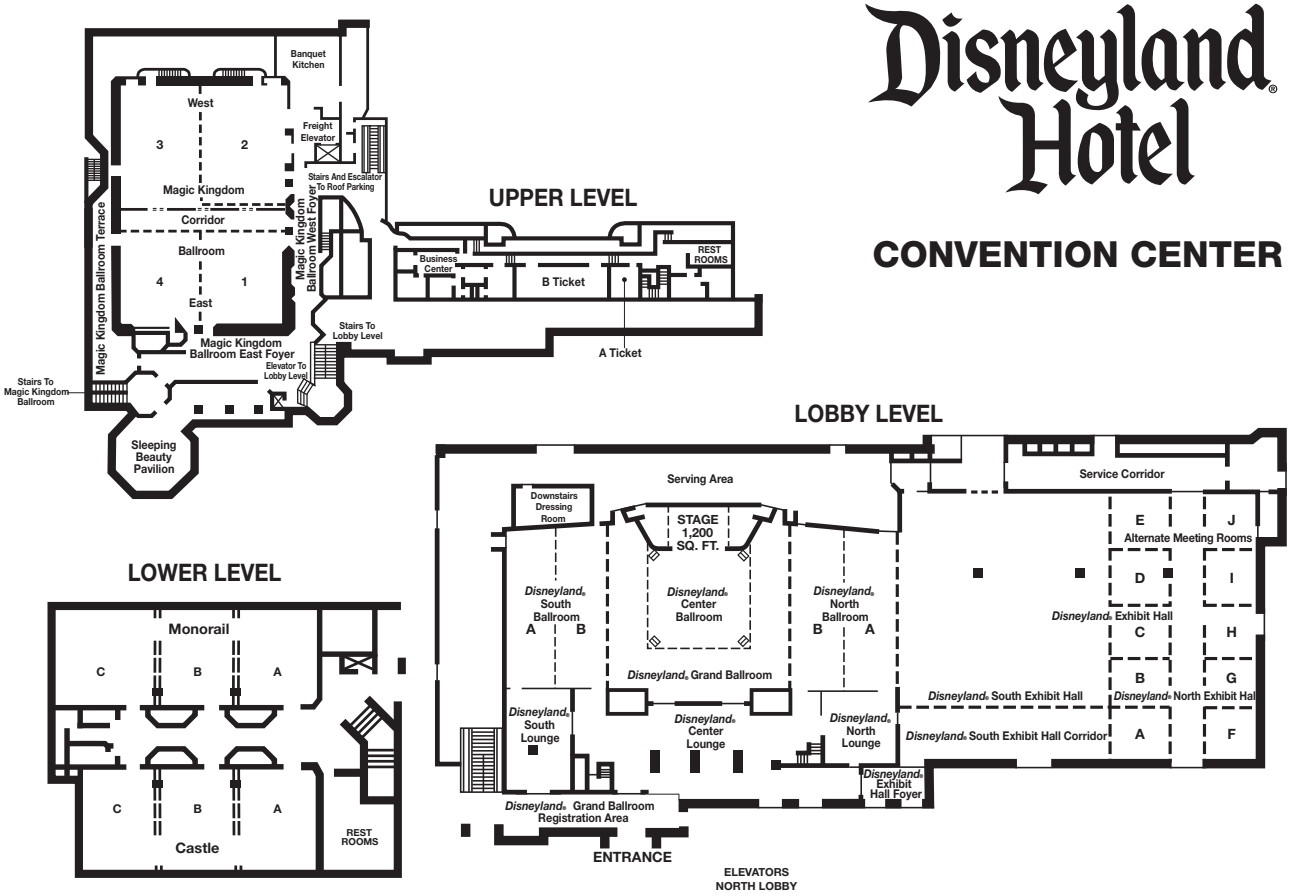
Wolf Creek Nuclear Operating Corp.

*See ans.org/orgmembers/memberlist for post-print roster updates.

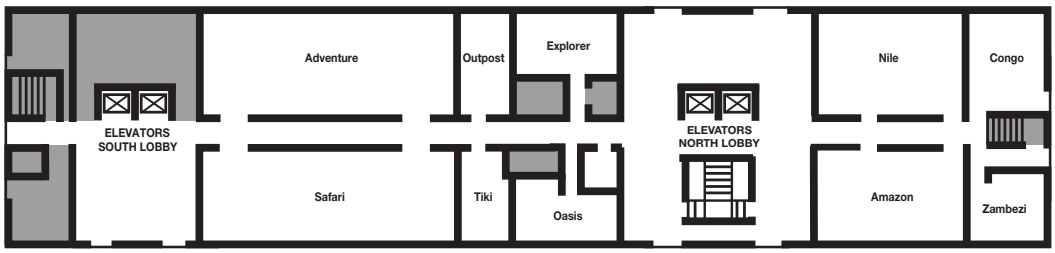
FANTASY TOWER

Disneyland® Hotel

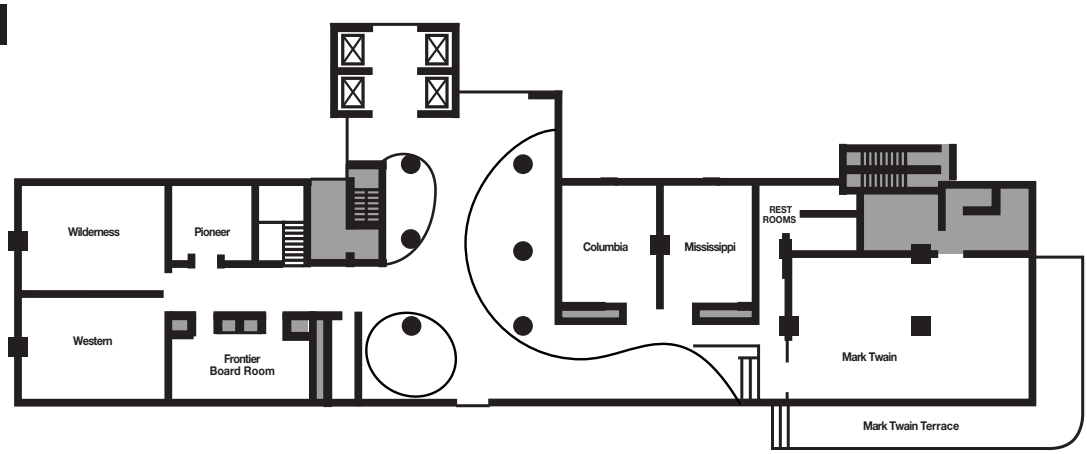
CONVENTION CENTER



ADVENTURE TOWER



FRONTIER TOWER



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HOTEL FEATURES & SERVICES

1 Front Desk
2 Guest Services
3 Bell & Valet Services
4 Rose Court Garden
5 Adventure Lawn
6 Frontier Lawn
7 *Magic Kingdom*® Lawn
8 Fitness Center
9 Guest Laundry
10 Business Center

SHOPPING & RECREATION

11 Disney's Fantasia Shop
12 small world Gifts & Sundries
13 Monorail Pool & Slides
14 D Ticket Pool
15 E Ticket Pool
16 Outdoor Fireplace

RESTAURANTS & LOUNGES

17 Steakhouse 55 & Lounge
18 Goofy's Kitchen
19 Tangaroa Terrace
20 Trader Sam's
21 The Coffee House

LEGEND

- E Elevators
- Restrooms
- Telephones
- ATM
- Monorail Station
- Bus Pick-Up
- Designated Smoking Areas
- AED Automated External Defibrillator

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CONVENTION & BANQUET FACILITIES

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Lower Level (Entrance Near Steakhouse 55)
- Castle A-C Room
- Monorail A-C Room

Main Level
- *Disneyland*® Grand Ballroom
  - North, Center, & South Ballroom
  - North, Center, & South Lounge
- *Disneyland*® Exhibit Hall

Upper Level
- *Magic Kingdom*® Ballroom 1-4
- Sleeping Beauty Pavilion
- A Ticket Room
- B Ticket Room

Adventure Tower

Nile	Tiki
Congo	Safari
Zambezi	Adventure
Amazon	Outpost
Oasis	Explorer

Frontier Tower

Western	Mississippi
Wilderness	Mark Twain
Pioneer	Frontier Board Room
Columbia	

Outdoor Event Areas
- Rose Court Garden
- Adventure Lawn
- Frontier Lawn
- *Magic Kingdom*® Lawn

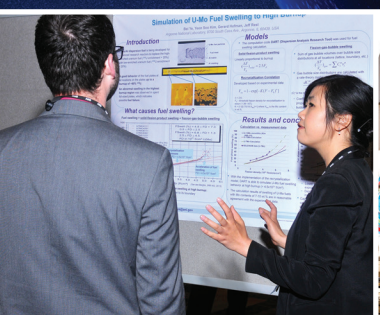
GUEST ROOMS

Fantasy Tower: __00 - __35
Adventure Tower: __36 - __67
Frontier Tower: __68 - __99
(Add first two numbers for floor number)

ANS Conference

2015 Annual Meeting

Nuclear Technology: An Essential Part of the Solution



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