



Your FCWMD Leadership Team

We all thank you for being a member of the ANS FCWMD and we look forward to meeting and working with you. Please don't hesitate to reach out to us with suggestions or if you'd like to get involved.

Officers

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Kathryn D. Huff – Vice Chair

Jean-Francois (Jef) Lucchini – Secretary /Treasurer

Jared A. Johnson – Technical Program

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Executive Committee (Terms Expiring)

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Emory D. Collins (2016)

Matthew L. Dennis (2016)

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Terry A. Todd (2017)

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Visit our Website

fcwmd.ans.org

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A Message from the Officers

Welcome to the Fall 2015 Fuel Cycle & Waste Management Division newsletter! This is the first newsletter in this format, and we hope you will find it easy to read!

It's almost the end of the year, and it's a good time to celebrate the good work of some of our members, and honor their contribution to the field and to the Society. Take the time to get to know the 2015 Randall Scholarship recipient (p.2), and this year Lifetime Achievement Award and Significant Contribution Award recipients (p.4 and 5). We are also acknowledging our new Program Chair (p.6), and our three new Executive Committee members (p.7 and 8). They all deserve Kudos!

As always, FCWMD is proposing many technical sessions to this coming Winter meeting in DC (p.3), and to

the 2016 Annual meeting in June (p.6). Please come and attend our sessions in November, and solicit papers to our sessions in June!

Your feedback on this newsletter, on our new website (www.fcwmd.ans.org) and on any current topics in fuel cycle and FCWMD activities is always most welcome. Please do not hesitate to send short articles on your field of work to share with all of our members.

We all hope to see you in November in DC and June in New Orleans.

Jef Lucchini,

FCWMD Secretary/Treasurer,
on behalf of the FCWMD Officers



MISSION

The Fuel Cycle and Waste Management Division (FCWMD) is devoted to all aspects of the nuclear fuel cycle including waste management, worldwide. Division specific areas of interest and involvement include uranium conversion and enrichment; fuel fabrication, management (in-core and ex-core) and recycle; transportation; safeguards; high-level, low-level and mixed waste management and disposal; public policy and program management; decontamination and decommissioning environmental restoration; and excess weapons materials disposition.

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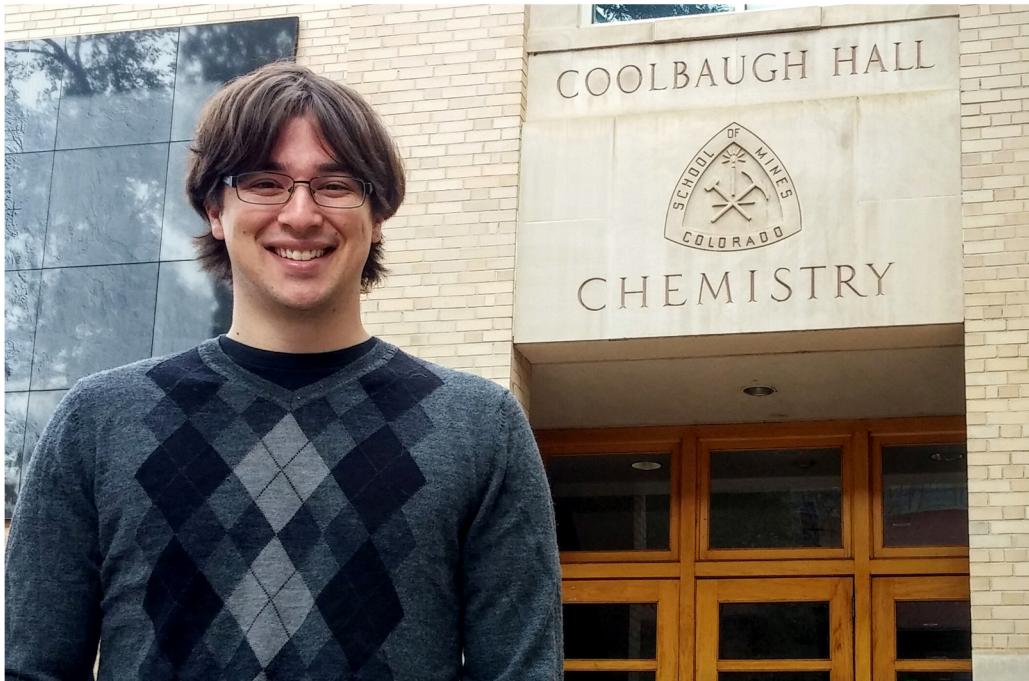
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2015 J. Randall Scholarship

Michael Servis, Colorado School of Mines

Did you know?

This award is in honor of Dr. John D. Randall. It is awarded yearly to a "student pursuing graduate studies in the areas of science and engineering related to the nuclear fuel cycle and radioactive waste management." Dr. Randall was the Deputy Commission and the Executive Director of the Low-Level Radioactive Waste Program for the state of New York, and was a professor of nuclear engineering at Texas A&M, where he directed the Nuclear Science Center from 1958 to 1983. He was a fellow of the American Nuclear Society and a recipient of the Society's Exceptional Service Award. During 1991-1992, Dr. Randall served as national chairman of the Society's Fuel Cycle & Waste Management Division and its Honors & Awards Committee.

I was born and grew up in East Lansing, Michigan. I graduated from Carleton College in Northfield, Minnesota in 2011 where I studied physics. I was a pitcher there on the baseball team. I also did some research in experimental low temperature physics concerning the helium superfluid transition. I have since been at the Colorado School of Mines as a PhD student in Nuclear Engineering working with Dr. Jenifer Braley and Dr. David Wu in the chemistry department. My research has involved experimental and molecular simulation work on understanding third phase formation in solvent extraction processes relevant to nuclear fuel reprocessing.

FCWM- Sponsored Scholarships

Educating and supporting the development of the future workforce is critical to the continued growth of nuclear science and technology. Each year, the ANS awards numerous scholarships to college undergraduates and graduate students pursuing nuclear-related degrees. An important activity of the Fuel Cycle and Waste Management Division is sponsoring scholarships to acknowledge the contributions of our young members to the field.

Currently, FCWMD is sponsoring two scholarships:

- **The J. Randall Scholarship**

Periodicity:

Annually

Presented:

Usually at the ANS National Annual Meeting
2015 Awardee will be honored at the Winter Meeting

Nomination Deadline:

February 1

- **The Michael Lineberry Memorial Scholarship**

This scholarship is to be established in memory of Michael Lineberry who passed away last year. Dr. Lineberry had previously served as Treasurer of ANS, and was a key member of the FCWM Division.

Information on the FCWMD Scholarships can be found on the FCWMD website, under the "Scholarships" tab.

November 8-12, 2015
Marriott Wardman Park
Washington, DC

2015 ANS Winter meeting

Twelve FCWMD sessions ...

1. - **International Perspective of Electrochemical Recycling**—Panel, **Mon. p.m.**
Session Organizer/Chair: **Patricia D. Paviet (DOE)**
Panelists:• Fiona Rayment (NNL) • Mark Williamson (ANL) • Eric Loewen (GE Hitachi) • Luc Van Den Durpel (Nuclear-21) • Rushan Lin (China Inst of Atomic Energy) • Do Hee (Korean Atomic Energy Research Inst) • Jean-Paul Glatz (Inst of Transuranics)
2. - **Re-Establishing Plutonium-238 Production in the United States**, **Tues. a.m.**
Session Organizer: **Robert M. Wham (ORNL)** *Cochairs:* Robert M. Wham (ORNL), John Bess (INL) cosponsored by ANSTD (**8 papers**)
3. - **Collaborative R&D for Future Nuclear Energy**—Panel, **Tues. p.m.**
Session Organizer/Chair: **Fiona E. Rayment (NNL)**
Panelists:• Andrew Griffith (US DOE) • Andrew Sherry (UK National Nuclear Lab) • Luc Van Den Durpel (Nuclear-21.Net) • Terry Todd (INL)
4. - **Updates on Nuclear Waste Repository Projects**, **Wed. a.m.**
Session Organizer/Chair: **Jean-Francois Lucchini (LANL)** (**5 papers**)
5. - **Progress in U.S. DOE's Fuel Cycle R&D Program**—Panel, **Wed. a.m.**
Session Organizer/Chair: **Jack D. Law (INL)**
Panelists:• Stephanie Bruffey (ORNL) • Amanda Casella (PNNL) • Kevin Field (ORNL) • Jason Harp (INL) • Ed Hoffman (ANL) • Eric Rauch (LANL) • Laura Maggos (ANL) • Nick Klymyshyn (PNNL)
6. - **Public Perception of Risk: Strategies to Address the "Perception Gap" with Nuclear Technologies**—Panel, **Wed. a.m.**
Session Organizer/Chair: **Steve Skutnik (Univ of Tennessee)**
Panelists:• David Ropeik (Ropeik & Associates) • Dan Kahan (Yale Univ) • Daniel Mussatti (NRC) • Margaret Harding (4Factor Consulting) • Katherine Rowan (Georgetown Univ)
7. - **Integrated Spent Nuclear Fuel Management Analysis Capabilities—I**, **Wed. p.m.**
Session Organizer/Chair: **John M. Scaglione (ORNL)** (**6 papers**)
8. - **Integrated Spent Nuclear Fuel Management Analysis Capabilities—II**, **Wed. p.m.**
Session Organizer/Chair: **John M. Scaglione (ORNL)** (**5 papers**)
9. - **Recycle and Reuse of Used Nuclear Fuel Resources**, **Wed. p.m.**
Session Organizer/Chair: **Guillermo Daniel DelCul (ORNL)** (**4 papers**)
10. - **Fuel Cycle and Waste Management: General—I**, **Thurs. a.m.**
Session Organizer: **Jean-Francois Lucchini (LANL)** Chair: Jared Johnson (ORNL) (**9 papers**)
11. - **Fuel Cycle and Waste Management: General—II**, **Thurs. p.m.**
Session Organizer/Chair: **Jean-Francois Lucchini (LANL)** (**9 papers**)
12. - **Proliferation Risk and Sustainability of Nuclear Energy Systems**—Panel
Sponsored by NNPD; cosponsored by FCWMD **Wed. a.m.**
Session Organizer: **Luc G.G. Van Den Durpel (Nuclear-21.net)** *Chair:* Robert A. Bari (BNL)

... for you to attend!

How to Propose Conference Sessions

Jared A. Johnson of Oak Ridge National Laboratory is our Program Chair, and he will be welcome to take your suggestions. Any member can propose, organize or chair a session at an ANS meeting, just follow the steps below. You have a great idea but don't want to chair the session? That's OK; we probably have another member willing to help out.

1. Have a title, and write a 100-word description about the intended session/topic. Specify if it will be a panel or paper session.
2. Submit the summary at the Program Committee meeting or send it to anyone on the leadership team to represent it for you. Sessions are decided on a year in advance. During the upcoming ANS Winter meeting, we will choose sessions for the 2016 Winter meeting in Las Vegas, NV.
3. Solicit experts to submit summaries by the deadline (usually about six months in advance) of the meeting in which the session will occur.

Did you know?

Among the 20 ANS Divisions that propose sessions at the 2015 Winter meeting in Washington, DC, your FCWM Division offers 12 sessions.

This is more than any other division!

Our last three national meetings were also very prolific: 10 sessions at the 2014 and 2015 Annual meetings, 16 sessions at the 2014 Winter meeting

Way to go, FCWMD!



2015 FCWM Lifetime Achievement Award Emory Collins, Oak Ridge National Laboratory

Emory D. Collins is Senior Technical Advisor for Advanced Fuel Cycles and Isotope Production and Lead Radiochemical Engineer in the Nuclear Security and Isotopes Technology Division at Oak Ridge National Laboratory. He has over 50 years of experience in chemical engineering and technical management, primarily in the fields of radiochemical separations, transuranium element processing, and advanced nuclear fuel cycles. He is nationally and internationally recognized in these fields, and has been the U.S. representative for the OECD/NEA Expert Group on Fuel Cycle Chemistry for the past 10 years. He has served as ORNL Program Manager for the DOE Nuclear Energy Advanced Fuel Cycle Initiative, with responsibility for projects in separations, fuel development, and systems analysis. He was a member of the NNSA design review team for the U.S. MOX Fuel Fabrication Facility from 1999 to 2006 and provided oversight for aqueous purification of plutonium, facility design, and chemical safety. Earlier, he was Program Manager and Section Head for Isotope Production at ORNL, manager of the Uranium-233 pilot plant, and technical group leader for the Transuranium Element Production Program. Also, he was co-designer of the ion exchange process used to decontaminate high-activity-level water following the reactor accident at Three Mile Island Unit-2, and served as ORNL program manager for technical assistance to the TMI-2 recovery program. Mr. Collins is active in several technical societies, including the American Nuclear Society and the American Institute of Chemical Engineers. He has received several prestigious awards, including the 2004 Glenn T. Seaborg Award for Actinide Separations, a 2007 IR-100 Award, four patents, and is the author of numerous technical publications. He is currently involved in projects to re-establish production of plutonium-238 in the U.S. and to recover and recycle zirconium from used nuclear fuel cladding.

ANS Position Statement #45

A team with representatives from FCWMD and the Nuclear Nonproliferation Policy Division (NNPD) updated Position Statement (PS) 45 Nuclear Fuel Recycling (ANS-45-2014). PS 45 was originally adopted in 2002 after several attempts during the 1990s. It was updated in 2007 without substantial changes to the original statement and had limited references and no background information. The revised PS includes appropriate references and background information including discussion of the BRC recommendations on fuel recycle and the information developed in the aftermath of Fukushima related to the MOX fuel performance.

The other FCWM Position Statements can be found on the FCWMD website, under the "Issues" tab. Periodic review is recommended with full updates in 2 to 4 years. The Division recently formed a revision committee to update Public Policy Statement PS 46 Risk-Informed and Performance-Based Regulations for Nuclear Technology.

Anyone interested in helping update or draft position statements can contact the FCWMD Chair, Jeffery R. Brault.

Did you know?

This award was established in 2014 by the Fuel Cycle and Waste Management Division to recognize individuals who have made major lifetime contributions that significantly advanced the scientific, engineering, societal, or regulatory aspects of the nuclear fuel cycle and/or the nuclear waste management mission.

The award is a plaque given at the opening or President's plenary session. An article detailing the achievement will be published in RadWaste Solutions, and a blog post commemorating the achievement will be posted on the FCWMD website or ANS Nuclear Cafe. The highlights of the award ceremony including the picture with ANS president will be advertised in Nuclear News.

2015 FCWM Significant Contribution Award

John Kessler, Electric Power Research Institute

"I am honored to have been given the ANS FCWMD 2015 Significant Achievement Award. During my 25+ years working on various spent fuel, LLW, and HLW management projects I now have a deeper appreciation of both the challenges and successes of managing these waste streams.

Prior to the late 1980s to early 1990s most of us thought spent fuel and HLW would be straightforward (and that I would see the operation of a spent fuel and HLW disposal facility in the US during my career!). In almost all countries it has been anything but the case. While many of the technical challenges of disposal have been and can be overcome, it has been recognized that the major challenge is public "acceptance", which, in turn, has a direct effect on political support for disposal projects, and has had an indirect effect on the nature and execution of disposal regulations. Spent fuel, LLW, and HLW programs in several countries have had to start almost completely over to address these issues. As many of us in the FCWMD are technical people, it is important for us to understand the public perspective and to be prepared to address public concerns. This underscores our need to be as objective and humble as possible about our work – and especially to hone our communication skills at all levels of detail.

Since disposal has been delayed in most countries by many decades, it is now imperative that existing storage systems be thoroughly evaluated to understand how long they will maintain compliance with applicable regulations. In the near future new storage/transportation systems will likely need to be designed with not only improved longevity, but also improved inspectability. Regarding spent fuel management, delays in disposal and/or the lack of reprocessing facilities have caused spent fuel pools to approach and even reach their capacity. In the US, moving spent fuel out of the pools into dry storage began back in 1986. Today, in the US alone there are well over 2000 dry storage systems located at most operating reactor sites and all decommissioned sites. Hence, there now exists the need to perform RD&D for storage and transportation systems related to prediction of the ability of the systems to continue to meet regulations, which will include basic and applied R&D, the development of inspection systems, and the development of mitigation techniques (e.g., weld repair, use of more corrosion-resistant materials, and storage system replacement).

Having spent over 20 years of my career on the development of waste forms for disposal and methods for predicting the long-term behavior of the proposed Yucca Mountain disposal facility, I had to make the change to working on mostly technical issues related to safe, long-term storage of spent fuel followed by transportation after decades of initial storage. The public is justifiably concerned that spent fuel and HLW storage will become de facto permanent disposal. Hence, I now spend most of my time identifying the necessary R&D to support prediction of storage system behavior, but also some time related to addressing public concerns about long-term storage.

I want to repeat my thanks to the FCWMD and those who nominated and supported my candidacy for this 2015 Lifetime Achievement Award. For the reasons given above, I see the role of the FCWMD to increase in importance related to the future of the nuclear industry."

John Kessler



From 1993 to June 1995 John was the manager of the High-Level Waste and Spent Fuel Management Program at EPRI (formerly the Electric Power Research Institute). His background includes Yucca Mountain total system performance assessment using probabilistic methods, colloid-aided contaminant migration research, LLW and spent fuel storage system design, waste solidification R&D, and aging management for used fuel storage systems. John holds a BS and MS in Nuclear Engineering from the University of Illinois at Urbana-Champaign, and a Ph.D. in Hydrogeology from the University of California at Berkeley.

John has led EPRI's effort in developing a probabilistic approach to understanding the overall impact of disposing of spent fuel in the candidate repository at Yucca Mountain.

On the spent fuel storage side, John co-organized an international effort to obtain the necessary technical bases to support extended used fuel storage (>60 years). John is leading R&D to develop dry cask storage inspection techniques and the joint development of an extended storage demonstration program for high burnup used fuel.

Other work in the program John manages involves assessment of spent fuel pool safety, modeling of advanced fuel cycles, collection of high burnup used fuel properties, and spent fuel pool criticality analyses.

Did you know?

This award was established in 2014 by the Fuel Cycle and Waste Management Division to recognize individuals or teams for a successful accomplishment that significantly advanced the scientific, engineering, societal, or regulatory aspects of the nuclear fuel cycle and/or the nuclear waste management. Awards may be given to an individual or collectively to a team for success on a single project, activity, contribution, or sustained initiative related to the nuclear fuel cycle and/or nuclear waste management.

The award will be a plaque given at the opening or President's plenary session. An article detailing the achievement will be published in RadWaste Solutions, and a blog post commemorating the achievement will be posted on the FCWMD website or the ANS Nuclear Cafe.

Meet our new FCWMD Program Chair!

Jared A. Johnson, Oak Ridge National Laboratory

Dr. Johnson has been a staff researcher at ORNL's Radiochemical Engineering Development Center for 7 years. He holds a Ph.D. in Chemical Engineering from the University of Tennessee, from which he also earned his BS and MS in Chemical Engineering. He has conducted research on various facets of nuclear fuel reprocessing for 10 years with a focus on head-end and solvent extraction processes. Dr. Johnson has also conducted research in the areas of radioisotope production and nuclear waste form development. Through these efforts, he has worked in both glovebox and hot cell environments. His areas of expertise include material characterization, radiochemistry, and off-gas abatement. Dr. Johnson spent 2013-2015 serving as a technical advisor to NA-22's Nuclear Weaponization and Material Production Detection Team. He currently is the Technical Team Lead for the National Security and Nuclear Energy Team in the Nuclear Materials Processing Group.



Proposed FCWMD Sessions for the 2016 ANS Annual Meeting in New Orleans, LA

- 6a. Advanced Fuel Cycle Technology (**Jinsuo Zhang**)
- 6b. Fuel Cycle Analysis (**Katy Huff**) (Arrielle Opotowsky)
- 6c. Heat Storage and Hybrid Energy Systems (**Charles Forsberg**) (co-sponsored: OPD)
- 6d. Recycle and Reuse of Used Nuclear Fuel Resources (**Bill DeCul**)
- 6e. University Research in Fuel Cycle and Waste Management (**Jack Law**)
- 6f. Consolidated Storage of Commercial Used Fuel (**Steve Nesbit**)
- 6g. The Waste Isolation Pilot Plant—On the Way to Recovery (**Jef Lucchini**)
- 6h. Fuel Cycle and Waste Management: General (**Jared Johnson**)
- 6i. Advances in Transportation Risk Assessment (**Ruth Weiner**)

*Papers can be submitted (<http://epsr.ans.org/meeting/?m=146>) until January 8, 2016.
Don't wait! Submit your paper now!*

Our new Executive Officers

Steven L. Krahn, Vanderbilt University

Professor of the Practice of Nuclear Environmental Engineering, Vanderbilt University, Nashville, TN. BS University of Wisconsin (1978), MS University of Virginia (1994), PhD University of Southern California (2001). Previous positions include: Deputy Assistant Secretary for Safety & Security and R&D Office Director, US Department of Energy - Office of Environmental Management (2007-2010); Senior Vice President/Senior Consulting Nuclear Engineer, Perot System Government Services (2000-2007); Deputy Technical Director and other SES positions, US Defense Nuclear Facilities Safety Board (1991-1998); Consulting Engineer (1988-1991); Nuclear Engineer, US Naval Nuclear Propulsion Program (1978-1988). Teach graduate courses in Nuclear Environmental Engineering and perform research in the nuclear fuel cycle, potential Thorium fuel cycles and development of nuclear technology; authored or co-authored more than 40 journal and conference papers on nuclear fuel cycle & nuclear safety topics. Member AIChE, INCOSE, presented the DOE Career Meritorious Service Award in 2010 and elected to American Academy of Environmental Engineers & Scientists 2013, Board Certified Environmental Engineer.



"I look forward to the opportunity to serve the ANS and the division on the Executive Committee. I am interested in helping the Division advance the understanding of fuel cycle technologies and issues within ANS and to the public, in general. I particularly enjoy being involved in rekindling the interest of students in studying the nuclear fuel cycle and understanding its world-wide scope and impact."
Steven Krahn



Patricia Paviet, Department of Energy

Dr. Patricia Paviet is the Director of the Office of Systems Engineering & Integration at the U.S. Department of Energy, in the Office of Nuclear Energy. Her office is responsible for the R&D activities related to material recovery and waste-form development, uranium extraction from seawater as well as fuel cycle options and scenario system analysis. Prior to joining DOE, she was the Deputy Director of the Institute of Nuclear Energy Science and Technology for fuel cycle research and education at the Idaho National Laboratory (INL) where she was responsible for strengthening and expanding INL's university partnerships to areas such as actinide science, separations, safeguards and instrumentation. From 2006 to 2010, she was associate professor at the Idaho State University and University of Nevada Las Vegas where she created and taught classes on the back end of the nuclear fuel cycle. She has worked for AREVA as the chemical safety lead for the MOX project based at the Savannah River Site. For the last 25 years her research work has focused on the speciation and behavior of radionuclides and actinides under industrial reprocessing conditions as well as under nuclear repository conditions. Her expertise directly supports the different process needs for advanced recycling technologies. She is originally from France and received her Ph.D. in radiochemistry co-sponsored by CEA and COGEMA in 1992 from the University of Paris XI.

Sven O. Bader, AREVA Federal Services



Currently Dr. Bader is an Advisory Engineer in the Used Fuel and Waste division of AREVA Federal Services. He has spent more than 20 years working on fuel cycle activities including on the MOX Fuel Fabrication Facility (MFFF), the Recycling Plant under Global Nuclear Energy Partnership Program (GNEP), the Yucca Mountain Project, the Centralized Interim Storage Facility (CISF), the U.S. EPR Reactor Project, and an assortment of smaller DOE projects (e.g., potential Sr-90 collection from the raffinates stream at La Hague). His primary focus has been on nuclear safety, licensing, and conceptual design activities. He has a Bachelor's of Science, Masters, & PhD in Nuclear Engineering from North Carolina State University.

"My commitment is to contribute to the growth of the FCWMD by continuing to emphasize the need for the U.S. to return to a position of global leadership in the fuel cycle field by emphasizing the need to develop recycling facilities. ANS Position Statement 45 provides a solid basis for this need and a position from which to build on. A fuel cycle that is integrated will provide a solid basis to place nuclear to the forefront of a means for providing clean, baseload energy in the U.S."

Sven Bader



Top Fuel 2016 is coming to Boise, Idaho, USA

September 11-16, 2016

Top Fuel, also called the Light Water Reactor (LWR) Fuel Performance Meeting, is an annual topical meeting organized by the American Nuclear Society, the European Nuclear Society, the Atomic Energy Society of Japan, the Chinese Nuclear Society and the Korean Nuclear Society. Top Fuel's primary objective is to bring together leading specialists in LWR fuel from around the world to analyze advances in nuclear fuel technology and to use the findings of the latest cutting-edge research to help manufacture the high performance nuclear fuels of today and tomorrow.

Visit www.inl.gov/TopFuel2016 for meeting details and to download the [Call for Papers](#) .

The abstract submission deadline is January 15, 2016.

Papers will be accepted in the following tracks:

1. Fuel Performance Reliability, Operations and Maintenance Experience
2. Advances in Fuel Technologies (e.g., Enhanced Accident Tolerant Fuel)
3. Transient and Off-normal Fuel Behavior
4. Used Fuel Storage, Transportation and Reuse/Recovery
5. Fuel Modeling and Analysis

For assistance, please contact:

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