Plutonium Futures—The Science 2018
A Topical Conference on Plutonium and Actinides

Official Program

September 9-14, 2018
Wyndham San Diego Bayside
San Diego, California, USA
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Plutonium Futures–The Science 2018
A Topical Conference on Plutonium and Actinides

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Kristiana Salazar (LANL)

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David Clark (Los Alamos National Laboratory)
## Daily Schedule

### Sunday, September 9

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:00 pm – 7:00 pm</td>
<td>Registration</td>
<td>Pacific Foyer</td>
</tr>
<tr>
<td>1:00 pm – 1:50 pm</td>
<td>Tutorial Session 1</td>
<td>Coast Room</td>
</tr>
<tr>
<td>2:00 pm – 2:50 pm</td>
<td>Tutorial Session 2</td>
<td>Coast Room</td>
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<tr>
<td>3:00 pm – 3:50 pm</td>
<td>Tutorial Session 3</td>
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<tr>
<td>4:00 pm – 4:50 pm</td>
<td>Tutorial Session 4</td>
<td>Coast Room</td>
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<tr>
<td>6:00 pm – 8:00 pm</td>
<td>Welcome Reception</td>
<td>Loma Vista Terrace</td>
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### Monday, September 10

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Location</th>
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<tbody>
<tr>
<td>7:30 am – 4:30 pm</td>
<td>Registration</td>
<td>Pacific Foyer</td>
</tr>
<tr>
<td>7:30 – 8:30 am</td>
<td>Morning Coffee Break</td>
<td>Pacific AB</td>
</tr>
<tr>
<td>8:15 am – 8:30 am</td>
<td>Welcome</td>
<td>Pacific AB</td>
</tr>
<tr>
<td>8:30 am – 9:45 am</td>
<td>Plenary Session—I</td>
<td>Coast Room</td>
</tr>
<tr>
<td>9:50 am – 10:15 am</td>
<td>Morning Break</td>
<td>Pacific CD</td>
</tr>
<tr>
<td>12:30 pm – 2:30 pm</td>
<td>Working Lunch/ Poster Session 1</td>
<td>Pacific Foyer</td>
</tr>
<tr>
<td>2:30 pm – 3:45 pm</td>
<td>Plenary Session—II</td>
<td>Pacific AB</td>
</tr>
<tr>
<td>3:50 pm – 6:20 pm</td>
<td>Technical Sessions</td>
<td>Pacific CD</td>
</tr>
<tr>
<td>4:20 pm – 4:35 pm</td>
<td>Afternoon Break</td>
<td>Pacific CD</td>
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### Tuesday, September 11

<table>
<thead>
<tr>
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<th>Activity</th>
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<tbody>
<tr>
<td>7:30 – 8:30 am</td>
<td>Morning Coffee Break</td>
<td>Pacific Foyer</td>
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<tr>
<td>8:00 am – 4:30 pm</td>
<td>Registration</td>
<td>Pacific AB</td>
</tr>
<tr>
<td>8:30 am – 9:45 am</td>
<td>Plenary Session—III</td>
<td>Coast Room</td>
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<tr>
<td>9:50 am – 12:20 pm</td>
<td>Technical Sessions</td>
<td>Pacific AB</td>
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<tr>
<td>10:20 am – 10:35 am</td>
<td>Morning Break</td>
<td>Coast Room</td>
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<tr>
<td>12:30 pm – 2:30 pm</td>
<td>Working Lunch/ Poster Session 2</td>
<td>Pacific CD</td>
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<td>2:30 pm – 3:45 pm</td>
<td>Plenary Session—IV</td>
<td>Pacific AB</td>
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<td>3:50 pm – 6:20 pm</td>
<td>Technical Sessions</td>
<td>Pacific AB</td>
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<tr>
<td>4:20 pm – 4:35 pm</td>
<td>Afternoon Break</td>
<td>Pacific CD</td>
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# Daily Schedule

## Wednesday, September 12

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<tr>
<td>7:30 – 8:30 am</td>
<td>Morning Coffee Break</td>
<td>Pacific Foyer</td>
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<tr>
<td>8:00 am – 11:00 am</td>
<td>Registration</td>
<td>Pacific Foyer</td>
</tr>
<tr>
<td>8:30 am – 9:45 am</td>
<td>Plenary Session—V</td>
<td>Pacific AB</td>
</tr>
<tr>
<td>9:50 am – 12:20 pm</td>
<td>Technical Sessions</td>
<td>Pacific AB</td>
</tr>
<tr>
<td>10:20 am – 10:35 am</td>
<td>Morning Break</td>
<td>Pacific Foyer</td>
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<tr>
<td>7:00 pm – 9:00 pm</td>
<td>Banquet &amp; After Dinner Speaker</td>
<td>Pacific CD</td>
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## Thursday, September 13

<table>
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<tr>
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<td>Morning Coffee Break</td>
<td>Pacific Foyer</td>
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<tr>
<td>8:00 am – 4:30 pm</td>
<td>Registration</td>
<td>Pacific Foyer</td>
</tr>
<tr>
<td>8:30 am – 9:45 am</td>
<td>Plenary Session—VI</td>
<td>Pacific AB</td>
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<tr>
<td>9:50 am – 12:20 pm</td>
<td>Technical Sessions</td>
<td>Pacific AB</td>
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<tr>
<td>10:20 am – 10:35 am</td>
<td>Morning Break</td>
<td>Pacific Foyer</td>
</tr>
<tr>
<td>12:30 pm – 2:30 pm</td>
<td>Attendee Luncheon</td>
<td>Loma Vista Terrace</td>
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<tr>
<td>2:30 pm – 3:45 pm</td>
<td>Plenary Session—VII</td>
<td>Pacific AB</td>
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<tr>
<td>3:50 pm – 6:20 pm</td>
<td>Technical Sessions</td>
<td>Pacific AB</td>
</tr>
<tr>
<td>4:20 pm – 4:35 pm</td>
<td>Afternoon Break</td>
<td>Pacific Foyer</td>
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## Friday, September 14

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Location</th>
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<tbody>
<tr>
<td>8:00 am – 10:30 pm</td>
<td>Registration</td>
<td>Pacific Foyer</td>
</tr>
<tr>
<td>8:30 am – 9:45 am</td>
<td>Plenary Session—VIII</td>
<td>Pacific AB</td>
</tr>
<tr>
<td>9:50 am – 12:30 pm</td>
<td>Technical Sessions</td>
<td>Pacific AB</td>
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<tr>
<td>10:20 am – 10:35 am</td>
<td>Morning Break</td>
<td>Pacific Foyer</td>
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<tr>
<td>12:45 pm – 1:15 pm</td>
<td>Closing</td>
<td>Pacific AB</td>
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</table>
MEETING INFORMATION

Plutonium Futures—The Science 2018 is a topical conference that provides an international forum for the presentation and discussion of current research on physical and chemical properties of plutonium and other actinide elements. This is the tenth conference in the series of acclaimed international conferences initiated by Los Alamos and Lawrence Livermore National Laboratories in 1997. The 2018 conference is co-sponsored by Los Alamos and Lawrence Livermore National Laboratories and the American Nuclear Society (ANS).

Plutonium Futures conferences provide an international forum for the discussion of current research on the physical and chemical properties of plutonium and other actinide elements. By bringing people of diverse disciplines together, the conference aims to enhance the dialogue among scientists and engineers on the fundamental properties of plutonium and other actinide elements, and their technological consequences.

REGISTRATION

Location: Pacific Foyer

Name badges must be worn during all technical sessions, and events. Certain events require a ticket, and may entail an additional cost.

REGISTRATION HOURS

<table>
<thead>
<tr>
<th>Date</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Sunday, September 9</td>
<td>5:00 - 7:00 pm</td>
</tr>
<tr>
<td>Monday, September 10</td>
<td>7:30 am-4:30 pm</td>
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<tr>
<td>Tuesday, September 11</td>
<td>8:00 am-4:30 pm</td>
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<tr>
<td>Wednesday, September 12</td>
<td>8:00 am-11:00 am</td>
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<tr>
<td>Thursday, September 13</td>
<td>8:00 am-4:30 pm</td>
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<tr>
<td>Friday, September 14</td>
<td>8:00 am-10:30 am</td>
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ANS CODE OF ETHICS

Preamble
Recognizing the profound importance of nuclear science and technology in affecting the quality of life throughout the world, members of the American Nuclear Society (ANS) are committed to the highest ethical and professional conduct.

Fundamental Principle
ANS members as professionals are dedicated to improving the understanding of nuclear science and technology, appropriate applications, and potential consequences of their use.

To that end, ANS members uphold and advance the integrity and honor of their professions by using their knowledge and skill for the enhancement of human welfare and the environment; being honest and impartial; serving with fidelity the public, their employers, and their clients; and striving to continuously improve the competence and prestige of their various professions.

ANS members shall subscribe to the following practices of professional conduct:

Principles of Professional Conduct
1. We hold paramount the safety, health, and welfare of the public and fellow workers, work to protect the environment, and strive to comply with the principles of sustainable development in the performance of our professional duties.
2. We will formally advise our employers, clients, or any appropriate authority and, if warranted, consider further disclosure, if and when we perceive that pursuit of our professional duties might have adverse consequences for the present or future public and fellow worker health and safety or the environment.
3. We act in accordance with all applicable laws and these Practices, lend support to others who strive to do likewise, and report violations to appropriate authorities.
4. We perform only those services that we are qualified by training or experience to perform, and provide full disclosure of our qualifications.
5. We present all data and claims, with their bases, truthfully, and are honest and truthful in all aspects of our professional activities. We issue public statements and make presentations on professional matters in an objective and truthful manner.
6. We continue our professional development and maintain an ethical commitment throughout our careers, encourage similar actions by our colleagues, and provide opportunities for the professional and ethical training of those persons under our supervision.
7. We act in a professional and ethical manner towards each employer or client and act as faithful agents or trustees, disclosing nothing of a proprietary nature concerning the business affairs or technical processes of any present or former client or employer without specific consent, unless necessary to abide by other provisions of this Code or applicable laws.
8. We disclose to affected parties, known or potential conflicts of interest or other circumstances, which might influence, or appear to influence, our judgment or impair the fairness or quality of our performance.
9. We treat all persons fairly.
10. We build our professional reputation on the merit of our services, do not compete unfairly with others, and avoid injuring others, their property, reputation, or employment.
11. We reject bribery and coercion in all their forms.
12. We accept responsibility for our actions; are open to and acknowledge criticism of our work; offer honest criticism of the work of others; properly credit the contributions of others; and do not accept credit for work not our own.
ABOUT ANS

Mission
ANS provides its members with opportunities for professional development. It also serves the nuclear community by creating a forum for sharing information and advancements in technology, and by engaging the public and policymakers through communication outreach.

Code of Ethics
Recognizing the profound importance of nuclear science and technology in affecting the quality of life throughout the world, members of the American Nuclear Society (ANS) are committed to the highest ethical and professional conduct.

To that end, ANS members as professionals are dedicated to improving the understanding of nuclear science and technology, appropriate applications, and potential consequences of their use.

Statement on Diversity
The American Nuclear Society (ANS) is committed, in principle and in practice, to creating a diverse and welcoming environment for everyone interested in nuclear science and technology. Diversity means creating an environment – both in ANS and in the profession – in which all members are valued equitably for their skills and abilities and respected equally for their unique perspectives and experiences. Diverse backgrounds foster unique contributions and capabilities, and so creation of an inclusive Society ultimately leads to a more creative, effective, and technically respected Society.

ANS believes that everyone deserves opportunities for learning, networking, leadership, training, recognition, volunteering in Society activities, and all the other benefits that involvement in the Society brings, regardless of age, color, creed, disability, ethnicity, gender identity and expression, marital status, military service status, national origin, parental status, physical appearance, race, religion, sex, or sexual orientation. The selection of a member to serve in ANS’s volunteer leadership structure shall be based solely on the member's ability, interest and commitment to serve. In particular, ANS encourages members at each level of the Society and in each Professional Division and Technical Group to make special efforts to recruit underrepresented minorities and women to ensure that they are adequately represented in the Society.

Respectful Behavior Policy (Abbreviated)
The open exchange of ideas, freedom of thought and expression, and productive scientific debate are central to the mission of the American Nuclear Society (ANS). These require an open and diverse environment that is built on dignity and mutual respect for all participants and ANS staff members, and is free of bias and intimidation.

ANS is dedicated to providing a safe, welcoming, and productive experience for everyone participating in Society events and other Society activities regardless of age, color, creed, disability, ethnicity, gender identity and expression, marital status, military service status, national origin, parental status, physical appearance, race, religion, sex, or sexual orientation. Creation of a safe and welcoming environment is a shared responsibility held by all participants. Therefore, ANS will not tolerate harassment of or by participants (including ANS volunteer leaders and staff members) in any form. Disciplinary action for participants found to have violated this principle may include reprimand, expulsion from an event or activity with or without a refund, temporary or permanent exclusion from all ANS events and activities, suspension or expulsion from volunteer leadership positions or groups, and/or suspension or expulsion from Society membership, as appropriate.

If you or someone else experiences harassment, regardless of how you otherwise choose to initially handle the situation, you are encouraged to report the situation to ANS. It is possible that the behavior you experienced is part of a larger pattern of repeated harassment. Please alert ANS to behavior you feel to be harassment regardless of the offender’s identity or standing in the Society.

The designated contact for reports at the Plutonium Futures–The Science 2018 is ANS Executive Director Bob Fine. Bob can be reached at rfine@ans.org.

The complete Respectful Behavior Policy can be found at www.ans.org/about/rbp. If you have questions about the policy, please contact ANS Executive Director Robert C. Fine at 708-579-8200 or rfine@ans.org.

Consent to Use Photographs and Videos: All attendance of registered participants, attendees, exhibitors, sponsors and guests (“you”) at American Nuclear Society (“ANS”) meetings, courses, conventions, conferences, or related activities (“Events”) constitutes an agreement between you and ANS regarding the use and distribution of your image, including but not limited to your name, voice and likeness (“Image”). By attending the ANS Events, you acknowledge and agree that photographs, videotaping, live feed video and audio, and/or audio recordings may be taken of you and you grant ANS the right to use, in perpetuity, your Image in any electronic or print distribution, or by other means hereinafter created, both now and in the future, for media, art, entertainment, promotional, marketing, advertising, trade, internal use, educational purposes or any other lawful purpose.
SUNDAY, SEPTEMBER 9

Tutorial Session: Nuclear Fuel
Session Chair: Mitch Meyer (INL)
Location: Coast Room Time: 1:00-1:50 pm

This tutorial will provide an overview of the history, design, and behavior of solid fuel systems for advanced reactors, with examples focused on metal fuels. Nuclear fuel, the heart (coeur) of fission reactors, operates in an extreme environment. Fission energy is transferred to the fuel matrix primarily through electronic stopping of highly charged fission fragments, with masses between ~75 and 155 amu and energies of 70-100 MeV, causing both damage creation and annealing. Since each fission reaction produces two or more fission products, there is large burnup dependent change in fuel composition. A significant percentage (~25%) of the fission products are the insoluble gases xenon and krypton, which precipitate and are redissolved through fission dependent processes. The fissile phase interacts with the cladding both chemically and mechanically. These processes cause profound changes to microstructure and material properties throughout the life of the fuel.

Tutorial Session: Predictive Modeling of Actinide Chemistry
Session Chair: Ping Yang (LANL)
Location: Coast Room Time: 2:00-2:50 pm

Nuclear energy represents a critical tool to ensure sustainable energy supplies and curb greenhouse gases. However, the development of nuclear energy is still hampered by safety concerns associated with handling and processing of spent fuel and high-level waste. The complicated electronic structure of actinide complexes leads to their versatility of chemical bonding, reactivity, and spectral and magnetic properties. I will present recent progress in quantum chemical computations applied to heavy element molecular chemistry and surface chemistry providing a molecular-level picture, and demonstrate how the synergy between theory and experiments has greatly accelerated the understanding of f-orbital participation in chemical bonding across the actinide series.

Tutorial Session: Plutonium X-ray Diffraction: A Tutorial
Session Chair: Brian L. Scott (LANL)
Location: Coast Room Time: 3:00-3:50 pm

Single crystal and powder X-ray diffraction techniques helped define plutonium science during its genesis in the mid twentieth century. The structural information provided by these techniques, including the three-dimensional structures of molecules and associated bond distances and angles, have laid the foundation for understanding chemical reactivity and properties in plutonium. This presentation will give a brief overview of X-ray diffraction, and the types of information this technique provides. The early history of plutonium crystallography, and the role it played in the development of the actinide series will be addressed. An overview of important X-ray structures that helped advance plutonium science, including the discovery of new valence states, chemical bonds, periodic trends, covalency, and other important phenomena will be given. The presentation will close with potential pit-falls and corresponding solutions relevant to practicing plutonium crystallography, addressing absorption, heavy atoms and pseudo symmetry, hydrogen atom location and refinement, and safe containment of radioisotopes.

Tutorial Session: Photon and Electron Spectroscopy of Plutonium Materials
Session Chair: John Joyce (LANL)
Location: Coast Room Time: 4:00-4:50 pm

A broad overview of the most common electron and photon spectroscopies used for Pu research will be presented. We will also look briefly at Pu microscopy capabilities and how microscopy couples to provide complementary information to spectroscopy. There will be some discussion of the unique and sometimes limiting restrictions of conducting Pu research at user facilities. Advances in facility and spectroscopy capabilities will be highlighted with emphasis on recent capabilities enabling new science in Pu materials. We will cover a range of Pu materials from metals to oxides and a number of interesting compounds including PuCoGa$_5$, PuTe and PuSb$_2$. Among the photon and electron techniques covered will be EXAFS, XAS, XPS, UPS and SEM.
MONDAY, SEPTEMBER 10
PLENARY SPECIAL SESSIONS - 8:15 AM

Welcome Session
Session Chair: Franz Freibert (LANL)
Location: Pacific AB Time: 8:15-8:30 am

Speakers to be announced.

Plenary Session—I
Session Co-Chairs: Donald T. Reed (LANL), Scott K. McCall (LLNL)
Location: Pacific AB Time: 8:30-9:45 am

8:30 am: WIPP Operations and the Disposal of Plutonium, Todd A. Shrader (DOE-CBFO), invited
9:10 am: The Advantage of Fission Fragment Damage, M. K. Meyer (INL), S. Pimbllott (INL), S. Zinkle, M. Lang (Univ of Tennessee Knoxville), invited

TECHNICAL SESSIONS - 9:50 AM

Metallurgy and Materials Science—I
Session Chair: Scott K. McCall (LLNL)
Location: Pacific AB Time: 9:50 am-12:20 pm

9:50 am: Plutonium Alloys and Delta Phase Stability: Solute Element Diffusion Plays an Important Part in the Martensitic Reversion Process and the Corrosion Phenomenon., B. Oudot, B. Ravat (CEA), A. Perron (LLNL), L. Jolly, C. Guéneau, F. Delaunay (CEA), invited
10:35 am: Effects of Irradiation-Induced Electronic Excitation on Simple and Complex Oxides, Cameron Tracy (Stanford Univ), invited
11:10 am: Atom Probe Tomography Analysis of Plutonium, Dallas Reilly, Edgar Buck, Amanda Casella, Jordan Corbey, Timothy Lach, Tenisha Meadows, Daniel Perea, Karl Pitts, Jon Schwantes (PNNL)
11:35 am: Dependence of Mechanical Properties of Actinides on Nano-Grain Structure and Alloying Addition Distribution, A. V. Karavaev, V. V. Dremov, F. A. Sapozhnikov, G. V. Ionov (RFNC)
12:00 pm: Perspectives in Using Raman Spectroscopy for Characterizing the Microstructure of Plutonium-Bearing Materials, Laetitia Medyk (CEA), Patrick Simon, Aurélien Canizares (CEMHTI), Dario Manara, Rudy J. M. Konings, Jean-Yves Colle (EC-JRC), Romain Vauchy, Christophe Valot (CEA), Gilles Montagnac (CNRS), Philippe M. Martin (CEA)

Environmental Chemistry—I
Session Chair: Donald T. Reed (LANL)
Location: Coast Room Time: 9:50 am-12:20 pm

10:35 am: Pu Transport Mechanisms in the Environment: Field Evidence, Conceptual Models, Experimental Data, and Remediation Strategies, Mavrik Zavarin (LLNL), invited
11:10 am: Examination of the Effect of Alpha Radiolysis on Pu(IV/V) Sorption to Minerals Using Multiple Pu isotopes, A. Schnurr (KIT), B. Powell (Clemson Univ)
11:35 am: Terrestrial Distribution of Pu in China: A Review of Published Data, Sixuan Li, Qiuju Guo (Peking Univ)
12:00 pm: Pu Redox Chemistry in the Presence of Iron-Bearing Minerals and EDTA, Nicole A. Moore (Univ of Notre Dame), Ezgi Yalcintas, Donald T. Reed (LANL), Amy E. Hixon (Univ of Notre Dame)
MONDAY, SEPTEMBER 10
TECHNICAL SESSIONS - 12:30 PM

Working Lunch/Poster Session—I
Location: Pacific CD Time: 12:30-2:30 pm

1. Laser Spectroscopy and Detection of Actinides/Lanthanides in Solutions, Igor Izosimov (JINR)
2. State and Composition of U Contained Within Fukushima Daiichi Derived Ejecta Particulate: Implications for Near-Surface Actinide Contamination and Species Mobility, P. G. Martin (Univ of Bristol), Y. Satou (JAEA), T. B. Scott (Univ of Bristol)
3. Screening of Serum Protein Expression Level in Plutonium Exposed Workers by Antibody Microarray Technique, Ying Liu, Mengxi Cheng, Xiaohui Ren (CAEP)
4. Application of Graphene Hydrogel-Based Materials for Radioactive Wastewater Treatment, Yan-Rong He, Zhao-Yi Tan, Dong Zhang (CAEP)
7. Low Temperature Radiation Damage Study of δ-Phase 239PuGa Alloys by Neutron Diffraction, Alice I. Smith, Sven C. Vogel, Jianzhong Zhang, Scott Richmond, Michael Ramos, James Gallegos, Franz J. Freibert (LANL)
8. Non-Equilibrium Chemical Routes to Metal Reduction, Ryan Stillwell, Kiel Holliday, Yaakov Idell, Jason Jeffries (LLNL)
11. On Materials Damage at the End of the α-Particle Path, B. A. Nadykto S. S. Sokolov, A. I. Panov, A. V. Samodolov (RFNC-VNIIEF)
12. Out with the Old and in with the New: Plutonium Materials Research Enhancements at Los Alamos National Laboratory, Jeremy N. Mitchell, Terry G. Holesinger, Matthew M. Schneider, Paul H. Tobash (LANL)
15. Feasibility Study of Separation of Plutonium from Metallographic Epoxy Mounts Using a Cremated Remains Processor, Jerzy Kulis (LANL)
16. Study on the Leaching of Actinides from Nuclear Fuel Debris, Akira Kirishima, Daisuke Akiyama (Tohoku Univ), Takayuki Sasaki (Kyoto Univ), Nobuaki Sato (Tohoku Univ)
17. The Selectively Separation of Cerium(III) by Sodium Bismuthate Nano-Sheets, Ning Wang, Chu-Ting Yang, Sheng Hu (CAEP)
19. Electrochemical Behavior of Lns on Active Electrode and Thermodynamic Date of Lns Intermetallic Compounds in LiCl-KCl Molten Salts, Tao Jiang, Ning Wang (CAEP)
20. GNEP-Sponsored Feasibility Studies of MOX Fuel Cycles in American BWRs and PWRs, Thongchai Patchana, Craig Hove, Thomas Bajat (Framatome), Dieter Bender (retired)
21. Structural and Electrochemical Investigations of Trivalent and Tetravalent Metal-Doped UO2, Sang Ho Lim (KAERI/UST), Jeongmook Lee, Janndee Kim, Young-Sang Youn, Jong-Yun Kim (KAERI)
MONDAY, SEPTEMBER 10
TECHNICAL SESSIONS - 12:30 PM

Working Lunch/Poster Session—I Continued
Location: Pacific CD Time: 12:30-2:30 pm

47. New Perspective on the Civil Utilization of Depleted Uranium: Superior Dosimeters and Scintillators, Shuao Wang (Soochow Univ)

49. Radiolytic Recombination of H₂, O₂ and N₂ over PuO₂ and Ceramic Oxide Surrogates, Darryl Messer, Luke Jones (Dalton Cumbrian Facility/Univ of Manchester), Robin Orr (NNL), Sven Koehler (Dalton Cumbrian Facility/Univ of Manchester/Manchester Metropolitan Univ), Simon Pimblott (Dalton Cumbrian Facility/Univ of Manchester/INL)

51. Possibility of Actinide Protection with Metal Coatings, T. Kazakovskaya, E. Goryachev, S. Bezrukov (RFNC-VNIIEF)

53. The Temperature-Dependent Transition From Parabolic to Linear Oxide Growth on Uranium Determined by Grazing Angle X-Ray Diffraction, C. K. Saw, Y. Idell, W. J. Siekhaus (LLNL)


57. Spectroscopic Ellipsometry Investigation of Time Dependent Oxidation Rates of Uranium in Pure Oxygen, Y. Idell, W. Siekhaus, K. Bloibaum, W. McLean II (LLNL)


61. Modelling the Surface Chemistry of Plutonium Oxide, Jonathan Collard, Nikolas Kaltsoyannis (Univ of Manchester)

63. Effects of Sputtering on Pu Surface by STM/STS/AES, Miles F. Beaux, Neliza León Brito, Igor O. Usov (LANL)

65. Microscopic Characterization of Teardrop Specimens Exposed to Plutonium Bearing Materials, Juan G. Duque, Josh Narlesky, Mary Ann Stroud, Daniel Rios, Elizabeth J. Kelly, Stephen A. Joyce, John M. Berg, D. Kirk Veirs, Laura A. Worl (LANL)

67. The First Principles Study of Interaction Properties Between Reactive Molecules and Pu-Dioxide Surface, Bo Sun, Hai Feng Liu, Hai-Feng Song (IAPCM)


75. Pressure-Driven Insulator-Metal Transition in Cubic Phase UO₂, Li Huang (CAEP), Yilin Wang (BNL), Philipp Werner (Univ of Firbourg)

77. Uranium Nitride U₂N₃ as a Novel Thermoelectric Material, Jing Liu, Zhong Long, Yin Hu, Kezhao Liu (CAEP)

79. Lanthanide and Actinide Imidophosphorane Chemistry: Molecular Models of Mixed-Valent f-Element Materials, Henry S. La Pierre, Natalie T. Rice, Thaige P. Gompa, Dominic P. Russo (Georgia Tech), Joshua Telser (Roosevelt Univ), Lukas Palatinus (Czech Academy of Sciences), John Bacsa (Georgia Tech)


83. Synthesis and Characterization of Tetravalent Actinide Complexes with Nitrogen Donor Ligands, Sebastian Schöene, Roger Klotitz, Juliane Mäerz, Peter Kaden, Michael Patzschke (HZDR), Peter W. Roesky (KIT), Thorsten Stumpf, Atsushi Ikeda-Ohno (HZDR)

85. Characterization and Kinetic Study of Plutonium III and IV Oxalates, Christopher R. Armstrong (PNNL)

87. The Synthesis and Characterization of Anhydrous Actinide Chlorides and Organic Cations, Jared Stritzinger, George Goff (LANL)

89. GD-MS Analysis of Al-Ga and Sn-Ga Alloys as Simulants for Actinide Materials. Kelly Pilcher (AWE)

MONDAY, SEPTEMBER 10
PLENARY SPECIAL SESSIONS - 2:30 PM

Plenary Session—II
Session Co-Chairs: Krzysztof Goñy (INL), John K. Gibson (LBNL)
Location: Pacific AB Time: 2:30-3:45 pm

2:30 pm: Chemical Separations for the Nuclear Fuel Cycle, T. A. Todd (INL), invited


TECHNICAL SESSIONS - 3:50 PM

Nuclear Fuel Cycle—I
Session Chair: Krzysztof Goñy (INL)
Location: Pacific AB Time: 3:50-6:20 pm

3:50 pm: Separation of Neptunium from Actinides in Acidic Feeds Using Different Extractants, P. K. Mohapatra (BARC), invited

4:35 pm: Closing the Nuclear Fuel Cycle, Mark A. Williamson (ANL), invited

5:10 pm: Radiolytic Gas Generation From Adsorbed Water on the Surface of PuO₂, Luke Jones (Univ of Manchester), Robin Orr, Howard Sims (NNL), Simon Pimbblott (INL)


6:00 pm: Plutonium and Uranium Coordination in the SiC Layer of Irradiated TRISO Fuel, Rachel Seibert (IIT), Kurt Terrani (ORNL), Jeff Terry (IIT)

Solution and Gas Phase Chemistry—I
Session Chair: John K. Gibson (LBNL)
Location: Coast Room Time: 3:50-5:55 pm

3:50 pm: Redox Behavior of Pu(III/IV) in Dilute to Concentrated Saline Systems, E. Yalcintas (LANL), A. N. Gaiser, T. Albrecht-Schmitt (Florida State Univ), Donald T. Reed (LANL), invited

4:35 pm: Plutonium Environmental Chemistry: Mechanisms for the Surface-Mediated Reduction of Pu(VI), Amy E. Hixon (Univ of Notre Dame), invited

5:10 pm: Ln/An-C Bonding in Biscarbene Complexes: A Relativistic Theoretical Study, Qun-Yan Wu, Zhi-Fang Chai (CAS), John K. Gibson (LBNL), Wei-Qun Shi (CAS)

5:35 pm: Speciation of Plutonium and Uranium in Natural Seawater and in P. Lividus Sea Urchin, M. R. Beccia, B. Reeves, M. Malouvier (Université Côte d’Azur), T. Dumas, P. Moisy (CEA, DEN), P. L. Solari (Synchrotron SOLEIL), M. Monfort, C. Moulin (CEA, DAM, DIF), D. K. Shuh (LBNL), C. Den Auwer (Université Côte d’Azur)

6:00 pm: New Chelating Agents for Plutonium Pulmonary Decorporation, L. Léost, L. Vincent, N. Sbirrazzuoli (Inst de Chimie de Nice), J. Roques (Univ Paris-Sud), A. Van Der Meeren (CEA), C. Hennig, A. Rossberg (HZDR), C. Den Auwer, C. Di Giorgio (Inst de Chimie de Nice)
TUESDAY, SEPTEMBER 11
PLENARY SPECIAL SESSION - 8:30 AM

Plenary Session—III
Session Co-Chairs: Franz Freibert (LANL), Mavrik Zavarin (LLNL)
Location: Pacific AB Time: 8:30-9:45 am

8:30 am: Plutonium Nanoparticles—Formation and Properties, Stepan Kalmykov (Moscow State Univ)

9:10 am: Metallurgy of PuGa Alloys: The Latest Insights into δ-Phase Stability and Oxidation, B. Ravat, B. Oudot, L. Jolly, F. Lalire, A. Perron, F. Delaunay (CEA), invited

TECHNICAL SESSIONS - 9:50 AM

Metallurgy and Materials Science—II
Session Chair: Franz Freibert (LANL)
Location: Pacific AB Time: 9:50 am-12:20 pm

9:50 am: In Stream Monitoring of Off-Gasses from Plutonium Fluorination, Amanda Casella (PNNL), Job Bello (Spectra Solutions), Sam Bryan, Richard Clark (PNNL), Calvin Delegard (TradeWinds), Jennifer Carter, Forrest Heller, Amanda Lines, Bruce McNamara (PNNL), invited


11:10 am: EXAFS Studies of Radiation Damage and Annealing in Pu, Daniel T. Olive, Alison L. Pugmire, Franz J. Freibert (LANL), Corwin H. Booth (LBNL)


12:00 pm: A New Paradigm in Actinide Research: Nuclear Materials Science at the Micron-Scale, Dallas Reilly, Reid Peterson, Dallas Reilly, Richard Clark, Daniel Perea, Richard Buckner, Edgar Buck, John Cliff, Michelle Conroy, Timothy Lach, Paul MacFarlan (PNNL), J. David Robertson (Univ of Missouri, Columbia), Camille Palmer, Todd Palmer (Oregon State Univ), Sue Clark (PNNL)

Environmental Chemistry—II
Session Chair: Mavrik Zavarin (LLNL)
Location: Coast Room Time: 9:50 am-12:20 pm


10:35 am: Pu Mobility in the Vadose Zone: Influence of Organic Matter, Redox Cycling, and PuO2 Dissolution, Brian A. Powell (Clemson Univ/SRNL), Nathan Conroy, Melody Maloubier, Kathryn Peruski (Clemson Univ), Hilary Emerson (Florida International Univ), Daniel I. Kaplan (SRNL), Mavrik Zavarin, Annie Kersting (LLNL)

11:10 am: Probing Plutonium Dioxide Nanoparticles with Synchrotron Methods, Evgeny Gerber (ESRF/HZDR/Lomonosov Moscow State Univ), Anna Romanchuk (Moscow State Univ), Ivan Pidchenko, Christoph Hennig (ESRF/HZDR), Alexander Trigub (Kurchatov Inst), Stephan Weiss (HZDR), Andreas C. Scheinost (ESRF/HZDR), Stepan Kalmykov (Moscow State Univ), Kristina O. Kvashnina (ESRF/HZDR)


12:00 pm: A Comparison of Plutonium Abundance in Soil from Sites in the United Kingdom Measured with High Efficiency, High-Resolution γ-Ray Spectroscopy, Neutron Assay and Accelerator Mass Spectrometry, C. Tighe (Lancaster Univ), M. Cristl (ETH), C. Degueldre (Lancaster Univ), J. Andrew (Dounreay Site Restoration Ltd), M. J. Joyce (Lancaster Univ)
2. Uranium(VI) Complexation with Aqueous Silicates in the Acidic to Alkaline pH-Range, Henry Løesch (HZDR), Jan Tits (PSI), Nina Huittinen (HZDR)


6. Trivalent Impurities Promote Oxygen Vacancy Segregation and Increase Oxygen Transport at Actinide Oxide Grain Boundaries, Adam R. Symington, James Grant (Univ of Bath), Marco Molinari (Univ of Huddersfield), Stephen C. Parker (Univ of Bath)

8. Aliovalent Actinide Incorporation into Zirconium(IV) Oxide—Spectroscopic Investigations of Defect Fluorite Structures, Manuel Eibl (HZDR), Samuel Shaw, Katherine Morris (Univ of Manchester), Thorsten Stumpf, Nina Huittinen (HZDR)

10. What Metallurgical Phenomena Can We Deduce from High-Precision Bulk Density Measurements?, Alexandria N. Marchi, Ryan M. Holguin, Franz J. Freibert (LANL)

12. L-Base Lathe at Los Alamos National Laboratory, Wendel Brown (LANL)

14. The PreCalc Project: Development of a Dynamic Model for Plutonium Processing, Lindsay E. Roy, Christopher South, Si Young Lee, Chaitanya Deo (SRNL)


18. Study of Young’s Modulus of Alpha and Delta Plutonium, Clarissa A. Yablinsky, Meghan J. Gibbs, Taylor R. Jacobs, Miranda L. Williams, Carlos D. Archuleta, Tomas A. Martinez, Tariq A. Saleh (LANL)

20. Advanced X-Ray Diffraction Line Profile Analysis Methods for Understanding the Microstructure Properties Distributions of Plutonium Oxide as a Function of Processing Conditions, Lucas E. Sweet, Jordan F. Corbey (PNNL), Matteo Leoni (Univ of Trento)

22. Towards the Electrolytic Oxide Reduction (EOR) of PuO₂: Mitigating Side Reactions in the Cerium System, Marisa J. Monreal, J. Matt Jackson, David A. T. Rodriquez, Kirk R. Weibrod (LANL), Michael F. Simpson (Univ of Utah)


28. Phase Identification and Thermophysical Properties Evaluation of As-Cast and Annealed Pu-Zr Alloys, Cynthia Papesch (INL), Assel Aitkaliyeva (INL, Univ of Florida)

30. Microfluidic Devices Applied to Uranium and Plutonium Extraction, Janelle Droessler, Eric Auchtner, Kevin Boland, Rebecca Chamberlin, Casey Finstad, George Goff, Quintessa Guengerich, David Kimball, Justin Marquez, Quinn McCulloch, John Rowley, Bradley Skidmore, Kirk Weibrod, Stephen Yarbro (LANL)


34. Plutonium Rock-Like Oxide Fuel (ROXf) System, Their Once-Through Burning and Usage., Ashraf Elsayed Mohamed Mohamed (Brno Univ)

36. An Overview Plutonium Work at NSUF Facilities at Los Alamos National Laboratory, Tarik A. Saleh, Thomas J. Venhaus, Adrian S. Losko, Sven C. Vogel (LANL)

38. Automation Separation and LSC Determination of Plutonium, Qinghua Xu, Zhonghua Xiong, Binyuan Xia, Hailing Zhang, Huanhuan Ding, Weidong Liu (CAEP)

40. Computational Modeling of Pu III Oxalate Precipitation in Acid Solution, Jacob L. Bair, Kerry E. Garrett, David G. Abrecht (PNNL)

42. Pu Surface Science Lab Capabilities at Los Alamos National Laboratory, Kevin S. Graham, Thomas Venhaus, John J. Joyce, Daniel Olive, Sarah Hernandez (LANL)

44. The Experimental Research on Oxidation Kinetics of Uranium Surface Treated by Laser Nitriding, Yin Hu, Haibo Li, Jianwei Qin, Xiaofang Wang, Yongbin Zhang, Yanzhi Zhang, Kezhao Liu (Science and Technology on Surface Physics and Chemistry Lab)

46. Recent Progress of Uranium Surface Nitridation, Ke-zhao Liu, Xiaofang Wang, Yin Hu, Zhong Long, Lizhu Luo (CAEP)
Technical Sessions:  
Tuesday September 11

TUESDAY, SEPTEMBER 11  
TECHNICAL SESSIONS - 12:30 PM

Working Lunch/Poster Session—II Continued  
Location: Pacific CD  
Time: 12:30-2:30 pm

48. Corrosion of Uranium in Liquid Water Under Contained Conditions with a Headspace Deuterium Overpressure, A. Banos, T. B. Scott (Univ of Bristol)

50. Comparison of Oxidation Behaviors of UN$_{0.68}$ and UN$_{1.66}$ by XPS, Lizhu Luo, Yin Hu, Kezhao Liu, Xiaolin Wang (CAEP)

52. Molecular Coordination on Erbium and Plutonium Surfaces: An Infrared Spectroscopy Study, J. D. Anderson, K. Campbell, T. J. Venhaus (LANL)

54. Sorption of Trivalent f-Elements by Biomaterials of Marine Origin — A TRLFS and Solid-State NMR Study, Kaitlin Kim Karlotta Kammerlander (Technische Univ Dresden), Nina Huittinen (HZDR), Silvia Paasch (Technische Univ Dresden), Thorsten Stumpf (HZDR), Eike Brunner (Technische Univ Dresden)

56. ToF-SIMS Analysis of Hydrogen Within the Native Plutonium Oxide Layer, Thomas J. Venhaus, Sarah C. Hernandez (LANL), Paul Roussel (AWE)


60. Effects of Oxygen Gas Exposure on the Electrical Properties and Electronic Structure of a 7 Atomic % Ga Stabilized δ-Pu Sample Surface, Neliza León-Brito, Miles F. Beaux II, Igor O. Usos (LANL)

62. Computational Tools for Uranium Compounds, Andrew Miskowiec, Ashley E. Shields, Jennifer L. Niedziela, Marie C. Kirkegaard (ORNL)

64. First Principles Investigation of the Electronic and Magnetic Structure of Pu$_6$Fe, Sarah C. Hernandez, John M. Wills (LANL)

66. Strong Anharmonicity in Uranium: Deeper Understanding Through Principal Vibrational Mode Analysis, Sven P. Rudin (LANL)


74. Observation of Intense X-Ray Scintillation in a Uranyl Organic Framework, Yaxing Wang (Soochow Univ/Sichuan Univ), Xuemiao Yin (Soochow Univ), Ning Liu (Sichuan Univ), Zhifang Chai, Chuan Wang (Soochow Univ)

76. Probing Uranium Complexation with Bio-Inspired Octadentate Hydroxyprydinonate (HOPO) and Catecholamide (CAM) Chelators, Korey P. Carter, Gauthier J.-P. Deblonde, Corwin H. Booth (LBNL), Rebecca J. Abergel (LBNL/Univ of California, Berkeley)

78. Probing the Influence of Acidity and Temperature to Th(IV) on Hydrolysis, Nucleation, and Structural Topology, Jian Lin, Jian-Qiang Wang (CAS)


82. Theoretical Insights on the Actinide Endohedral Borospherenes, Cong-Zhi Wang, Tao Bo, Jian-Hui Lan, Qun-Yan Wu, Zhi-Fang Chai, Wei-Qun Shi (CAS)

84. Alpha Energy Spectrum From a Plutonium Metal Surface From a Plutonium Metal Surface, Yongqiang Wang, Daniel Olive, Scott Richmond (LANL)

86. Desorption of Plutonium from Altered Nuclear Melt Glass Colloids, Claudia Joseph, Enrica Balboni, (LLNL), Teresa Baumer (Univ of Notre Dame), Kenri Treinen, Anne B. Kersting, Mavrik Zavarin (LLNL)

88. Regulatory Perspectives on Plutonium Oxidation States at the Waste Isolation Pilot Plant, Carlsbad, New Mexico, USA, E. F. U. Santillan (EPA)

90. Age Dating of Bulk Plutonium Materials. Kelly Pilcher (AWE)
TUESDAY, SEPTEMBER 11
PLENARY SPECIAL SESSIONS - 2:30 PM

Plenary Session—IV
Session Co-Chairs: P. K. Mohapatra (BARC), Dirk Bosbach (FzK)
Location: Pacific AB Time: 2:30-3:45 pm

2:30 pm: Waste Forms for the Nuclear Fuel Cycle, William J. Weber (Univ of Tennessee), Rodney C. Ewing (Stanford Univ), E. R. Vance, Daniel Gregg (ANSTO), Sylvain Peuget (CEA), Thierry Wiss (EC-JRC), invited

3:10 pm: Exploring and Expanding High Oxidation States of Actinides, John K. Gibson (LBNL), Monica Vasiliu (Univ of Alabama), Wibe A. de Jong (LBNL), Kirk A. Peterson (Washington State Univ), Phuong D. Dau, Yu Gong (LBNL), David A. Dixon (Univ of Alabama)

TECHNICAL SESSIONS - 3:50 PM

Nuclear Fuel Cycle—II
Session Chair: Prasanta Kumar Mohapatra (BARC)
Location: Pacific AB Time: 3:50-6:20 pm

3:50 pm: Pu Dissolution Yield of a Spent SFR MOX Fuel as a Function of Axial Position in the Reactor (PHENIX NESTOR-3 Tests), Nathalie Reynier-Tronche, Emilie Buravand, Eric Esbelin, Laurent Huyghe, Stephane Grandjean, Benedicte Arab-Chapelet (CEA)

4:35 pm: Microstructural Characterization of Pu-Based Fuels, Assel Aitkaliyeva (Univ of Florida), invited

5:10 pm: Recent Research Activities on the Separation and Coordination Chemistry of Transuranium Elements at INET, Chao Xu, Jing Chen (Tsinghua Univ)

5:35 pm: Cesium Separation from Aqueous Streams by Calix-Mono-Crown-Arene, Marie Simonnet, Yuji Miyazaki, Shinichi Suzuki, Tohru Kobayashi, Hideaki Shiwaku, Resuke Doi, Tsuyoshi Yaita (JAEA)

6:00 pm: A New Chemical Route of Nuclear Fuel (U,Pu)/O₂⁻ by Advanced Thermal Denitration in the Presence of Organic Additive, Martin Leblanc (CEA/ICSM), Gilles Leturcq, Eléonore Welcombe (CEA), Xavier Deschanels (ICSM), et Thibaud Delahaye (CEA)

Solution and Gas Phase Chemistry—II
Session Chair: Dirk Bosbach (FzJ)
Location: Coast Room Time: 3:50-6:20 pm

3:50 pm: Preparation of a New Water Soluble Polynuclear Peroxide Complex of Pu(IV), Matthieu Virot, Elodie Dalodière, Thomas Dumas (CEA), Oliver Dieste Blanco, Thierry Wiss (EC-JRC), Philippe Moisy, Sergey I. Nikitenko (CEA)

4:35 pm: Actinide-Iron Multiple Bonds in AnFe(CO)₃ and O AnFe (CO)₃ (An = Th, Pa, U, Np, Pu) Complexes, Jia-Qi Wang, Han-Shi Hu, Minfgei Zhou, Jun Li (Tsinghua Univ), invited

5:10 pm: A New Look at the Chelation of Transplutonium Elements Through EXAFS Spectroscopy, Gauthier J-P. Deblonde, Corwin H. Booth (LBNL), Morgan P. Kelley, Jing Su, Enrique R. Batista, Ping Yang (LANL), Rebecca J. Abergel (LBNL/ Univ of California, Berkeley)

5:35 pm: Characterization of Isostructural An(IV) Complexes with Hetero-Donor Imine Ligands, Thomas Radoske (HZDR), Olaf Walter (EC-JRC), Juliane März, Peter Kaden, Roger Kloditz, Michael Patzschke, Thorsten Stumpf, Atsushi Ikeda-Ohno (HZDR)

6:00 pm: Spectroscopic and Theoretical Studies on the Extracted Complexes of Am³⁺/Cm³⁺ by Purified Cyanex301: Multi-Species and Remarkable An-S Covalency, Ning Pu, Xihong He (Tsinghua Univ), Linfeng Rao (LBNL), Chao Xu, Jing Chen (Tsinghua Univ)
WEDNESDAY, SEPTEMBER 12
PLENARY SPECIAL SESSION - 8:30 AM

Plenary Session—V
Session Co-Chairs: David E. Hobart (Florida State Univ), David Geeson (AWE)
Location: Pacific AB Time: 8:30-9:45 am

8:30 am: Plutonium Analysis for Nuclear Safeguards and Forensics, Klaus Luetzenkirchen (Inst for Transuranium Elements)


TECHNICAL SESSIONS - 9:50 AM

Detection and Analysis—I
Session Chair: David E. Hobart (Florida State Univ)
Location: Pacific AB Time: 9:50 am-12:20 pm


10:35 am: Ultra-Trace Analysis with AMS of Actinides from Global Fallout and In-Situ Tracer Tests, Francesca Quinto, Horst Geckeisz (KIT), Karin Hain (VERA Lab), Urs Mäder (Univ of Bern), Markus Plaschke (KIT), Thorsten Shäfer (KIT/FSU). Peter Steier (VERA Lab), invited

11:10 am: Analysis of Plutonium Containing Particles by Resonant Laser-SNMS, Hauke Bosco, Manuel Raiwa, Martin Weiss (Leibniz Univ Hannover), Klaus Wendt (Johannes Gutenberg-Univ Mainz), Clemens Walther (Leibniz Univ Hannover)

11:35 am: Plutonium Mass Content Accurate Determination by Controlled Potential Coulometry at CETAMA, Sébastien Picart, Ygor Davrain, Marielle Crozet, Daniéle Roudil (CEA)

12:00 pm: Research Progress of Plutonium Measurement in the Environment, Wen Sheng Ren, Wenjing Dong, Dong Zhao, Hexiang Huang, Wei Wei (CAEP)

Surface Science and Corrosion—I
Session Chair: David Geeson (AWE)
Location: Coast Room Time: 9:50 am-12:20 pm


11:35 am: Adsorption, Dissociation, and Desorption of Water Molecules on the PuO₂ Surface Studied by Ab Initio Molecular Dynamics Simulations, Cui Zhang, Yu Yang, Ping Zhang (IAPCM)

12:00 pm: Identification of Chlorine-Containing Gases in PuO₂ Storage Containers, Daniel Rios, John M. Berg, Andrew J. Gaunt, Joshua E. Narlesky, Douglas K. Veirs, Laura A. Worl (LANL)
WEDNESDAY, SEPTEMBER 12
WEDNESDAY BANQUET - 7:00 PM

Banquet & After Dinner Speaker: The Pu Unknown Unknowns
Location: Pacific CD Time: 7:00-9:00 pm
Speaker: Dr. Terry C. Wallace, Jr. (Laboratory Director, LANL)

Dr. Terry C. Wallace, Jr., is the eleventh director of Los Alamos National Laboratory and current president of Los Alamos National Security, LLC. Los Alamos has played a critical role in some of the most transformational discoveries of the 20th and 21st centuries. As a premier national nuclear science laboratory, Los Alamos is a principal contributor to the U.S. Department of Energy’s mission to maintain the nation’s nuclear weapons stockpile. It also protects the nation through programs in nuclear counterproliferation and nonproliferation. Los Alamos creates innovative science and technology that define the state of the art, and 2018 marks our 75th anniversary of joining the Manhattan Project, followed by our first intelligence mission the subsequent year.

Prior to becoming Laboratory Director, Wallace was the Laboratory’s Principal Associate Director for Global Security and the Senior Intelligence Executive, leading national security programs—nonproliferation, counterproliferation and industry partnerships. He served as the Principal Associate Director for Science, Technology and Engineering and led implementation of the capability model for scientists and engineers. He also developed the science pillars that guide our institutional investment strategies. He has represented Los Alamos and DOE around the world, meeting with scientists and leaders of allied countries and attending significant collaborations with non-NATO countries.

Wallace is an internationally recognized scientific authority on geophysics and forensic seismology, which is the study of earthquakes and seismic waves as they relate to nuclear weapons testing, and has evaluated more than 1,700 U.S. and foreign nuclear tests. He is one of a few scientists to have a newly discovered mineral named in his honor for his efforts in education, research and service to mineralogy (Terrywallaceite). He is a Fellow in the American Geophysical Union and has served on the Board of Earth Sciences & Resources in the National Academy of Sciences. His awards include the Brown Medal, the Langmuir Medal for Research, the Macelwane Medal and the Carnegie Mineralogical Award. He was a distinguished educator at the University of Arizona for 20 years and continues to be a notable author through peer-reviewed journals, science magazines, a college textbook and a blog exploring the nexus of science, running and travel.

Wallace was raised in Los Alamos and is the first Laboratory Director with such a strong tie to New Mexico. He holds doctorate and master’s degrees in geophysics from the California Institute of Technology and bachelor’s degrees in geophysics and mathematics from New Mexico Institute of Mining and Technology.
THURSDAY, SEPTEMBER 13
PLENARY SPECIAL SESSION - 8:30 AM

Plenary Session—VI
Session Co-Chairs: Rebecca J. Abergel (Univ of California, Berkeley), Albert Migliori (LANL)
Location: Pacific AB Time: 8:30-9:45 am

8:30 am: Evaluating Covalency for Plutonium and the Other f-Elements, Stefan G. Minasian (LBNL), Sharon E. Bone (SLAC National Accelerator Lab), Samantha K. Cary, David L. Clark, Alex S. Ditter, Justin N. Cross (LANL), Matthias W. Lobie (Freudenberg Technology Innovation and Freudenberg Performance Materials), Andrew Kerridge (Lancaster Univ), Nikolai Kaltsoyannis (The Univ of Manchester), Veronika Mocko (LANL), Henry S. La Pierre (Georgia Tech), Angela C. Olson, Brian L. Scott (LANL), S. Chantel E. Steiber (California State Polytechnic Univ), Benjamin W. Stein, Jing Su (LANL), David K. Shuh (LBNL), Marianne P. Wilkerson, Ping Yang (LANL)


TECHNICAL SESSIONS - 9:50 AM

Coordination Chemistry—I
Session Chair: Rebecca J. Abergel (Univ of California, Berkeley)
Location: Pacific AB Time: 9:50 am-12:20 pm


10:35 am: Np and Pu Electronic Structure Through Metal-Ligand Multiple Bonds, Andrew J. Gaunt (LANL), invited

11:10 am: Schiff Base Coordination Complexes with Pu(IV) and Ce(IV), Bonnie E. Klamn, Matthew L. Marsh, Cory J. Windorff, David E. Hobart, Thomas E. Albrecht-Schmitt (Florida State Univ)

11:35 am: Complexation of Pu(VI) with N,N', N', N' (TMOGA) and Related Ligands: Optical Properties and Complexation Modes, Lei Xu, Ning Pu, Chao Xu, Jing Chen (Tsinghua Univ)

12:00 pm: Plutonium Chlorides: A Platform to Explore Assembly, Structure and Bonding, R. Gian Surbella (PNNL), Lucas C. Ducati (Univ of São Paulo), Jochen Autschbach (Univ at Buffalo), Jon M. Schwantes (PNNL), Christopher L. Cahill (The George Washington Univ)

Condensed Matter Physics—I
Session Chair: Boris Maiorov (LANL)
Location: Coast Room Time: 9:50 am- 12:20 pm

9:50 am: Formation and Migration Barrier Energies of Point Defects in δ-Pu and δ-Pu-Ga, Sarah C. Hernandez, Franz J. Freibert, Richard Hoagland, Blas P. Uberuaga, John M. Wills (LANL), invited

10:35 am: Theoretical Analysis of the Properties of Pu(IV) and Pu (VI), Paul S. Bagus (UNT), Connie J. Nelin (Consultant), invited

11:10 am: X-Ray Diffraction and Raman Characterization of a Variety of PuO$_2$ Samples, Brian L. Scott, Laura E. Wolfsberg, Jared T. Stritzinger, Alison L. Pugmire, Marianne P. Wilkerson (LANL)

11:35 am: Advanced X-Ray Diffraction Line Profile Analysis Methods for Understanding the Microstructure Properties Distributions of Plutonium Oxide as a Function of Processing Conditions, Lucas E. Sweet, Jordan F. Corbe (PNNL), Matteo Leoni (Univ of Trento)

12:00 pm: Exploring the Topology and Electronic Correlations in PuB$_4$, Laurel E. Winter, Hongchul Choi, Wei Zhu, Samantha Cary, Zhoushen Huang, Ross D. McDonald, Veronika Mocko, Brian L. Scott, Paul H. Tobash, Joe D. Thompson, Stosh A. Kozimor, Eric D. Bauer, Jian-Xin Zhu, Filip Ronning (LANL)
THURSDAY, SEPTEMBER 13
PLENARY SPECIAL SESSION - 2:30 PM

Plenary Session—VII
Session Co-Chairs: Klaus Luetzenkirchen (Inst for Transuranium Elements), Paul Roussel (AWE)
Location: Pacific AB Time: 2:30-3:45 pm

2:30 pm: Environmental Chemistry of Plutonium, Horst Geckeis (KIT), Mavrik Zavarin (LLNL), Brit Salbu, Ole Chr. Lind, Lindis Skipperud (NMBU), invited

3:10 pm: Plutonium Oxidation and Corrosion with EXAFS, Alison L. Pugmire (LANL), invited

TECHNICAL SESSIONS - 3:50 PM

Detection & Analysis—II
Session Chair: Klaus Luetzenkirchen (Inst for Transuranium Elements)
Location: Pacific AB Time: 3:50-6:20 pm


5:10 pm: Process Monitoring for Plutonium Content of U-TRU Alloys, B. R. Westphal, S. X. X. Li, D. A. Sell, J. C. Westphal (INL)


6:00 pm: Role of Carbon Oxides on Gas Formation Through Radiolysis Process in Nuclear Storages, L. Berlu, L. Venault, J. Vermeulen (CEA)

Surface Science and Corrosion—II
Session Chair: Paul Roussel (AWE)
Location: Coast Room Time: 3:50-6:20 pm

3:50 pm: Development of Rapid Semi-Empirical Quantum Models for Plutonium Surface Corrosion, Nir Goldman (LLNL/Uiv of California, Davis), Bálint Aradi (Univ of Bremen), Rebecca K. Lindsey, Laurence E. Fried (LLNL)

4:35 pm: PhotoElectron Spectroscopy Study of H2O Adsorption and Dissociation on Oxidized Pu Metal, L. Jolly, B. Ravat, B. Oudot, F. Delaunay (CEA)

5:10 pm: A Catalytic Approach to Thermal Recombination of H2 and O2 over the Surface of PuO2 and PuO2 Surrogates, Thomas A. Donoclift (Univ of Manchester), Robin M. Orr, Howard E. Sims (NNL), Simon M. Pimblott (INL)

5:35 pm: The Initial Kinetics and Corrosion Morphology for Reaction of Pu2O3-Coated Plutonium with Low Pressure Hydrogen, Gan Li, Haibo Li, Wenhua Luo (CAEP)

FRIDAY, SEPTEMBER 14
PLENARY SPECIAL SESSION - 8:30 AM

Plenary Session—VIII
Session Co-Chairs: Andrew Gaunt (LANL), Paul Bagus (Univ of North Texas)
Location: Pacific AB Time: 8:30-9:45 am

8:30 am: Pu Electronic Structure and Speciation Applying Pu M_5 Edge HR-XANES and RIXS, Tonya Vitova (KIT), invited

9:10 am: Recent Developments at the Interface of Quantum Matter and Plutonium Science, John L. Sarrao (LANL)

TECHNICAL SESSIONS - 9:50 AM

Coordination Chemistry—II
Session Chair: Andrew Gaunt (LANL)
Location: Pacific AB Time: 9:50 am-12:20 pm

9:50 am: Actinide Chemistry and Selectivity Revealed Through In Vivo Contamination and Decorporation Experiments, Rebecca J. Abergel (Univ of California Berkeley/LBNL), Gauthier J.-P. Deblonde, Dahlia D. An, Stacey Gauny (LBNL), invited

10:35 am: Covalency of Actinides (AnIII, AnIV) with Chelating Agents Across the Actinide Series (An = Th to Es), Ping Yang, Enrique Batista, Morgan Kelley, Jing Su (LANL), invited

11:10 am: Inner and Outer Sphere Plutonium(IV) Coordination with Amide and Carbamide Ligands, Dominique Guillaumont, Eléonor Acher, Clémence Berger, Thomas Dirks, Nathalie Boubals, Thomas Dumas, Christelle Tamain, Cécile Marie, Laurence Berthon (CEA)


12:00 pm: Structural Investigation of Plutonium Oxalate Species over Time and Comparison of Their Oxide Products, Jordan F. Corbey, Sergey I. Sinkov, Lucas E. Sweet, Calvin H, Delegard, Amanda J. Casella, David E. Meier (PNNL)

Condensed Matter Physics—II
Session Chair: Paul Bagus (Univ of North Texas)
Location: Pacific CD Time: 9:50 am-12:20 pm


10:35 am: Magnetostriction of Ga-Stabilized δ-Pu, Neil Harrison, Jonathon B. Betts, Marcelo Jaime, Paul Tobash (LANL), invited

11:10 am: Unifying DFT+U Approach for Plutonium Modeling, Boris Dorado, Bernard Amadon, François Bottin, Johann Bouchet (CEA)

11:35 am: Free-Energy Calculations for Plutonium, Per Söderlind, Babak Sadigh (LLNL)

12:00 pm: Temperature Dependent and Real Time Studies of Elastic Moduli of δ-239Pu and Alloys, Boris Maiorov, Jonathan B. Betts, Fedor F. Balakirev, Albert Migliori (LANL)

PLENARY SPECIAL SESSION - 12:45 PM

Closing Session
Session Chair: Franz Freibert (LANL)
Location: Pacific AB Time: 12:45-1:15 pm
ADVANCES IN NUCLEAR NONPROLIFERATION TECHNOLOGY AND POLICY CONFERENCE 2018
SEP 23-27, 2018 | Wilmington, NC | Hilton Wilmington Riverside

APPLICABILITY OF RADIATION-RESPONSE MODELS TO LOW DOSE PROTECTION STANDARDS
SEP 30-OCT 3, 2018 | Pasco, WA | Red Lion Hotel Pasco

2018 PACIFIC BASIN NUCLEAR CONFERENCE (PBNC 2018)
SEP 30-OCT 5, 2018 | San Francisco, CA | Hyatt Regency

2018 ANS WINTER MEETING AND NUCLEAR TECHNOLOGY EXPO
NOV 11-15, 2018 | Orlando, FL | Hilton Orlando Bonnet Creek

EMBEDDED TOPICAL: 23RD TOPICAL MEETING ON THE TECHNOLOGY OF FUSION ENERGY (TOFE)

EMBEDDED TOPICAL: INTERNATIONAL TOPICAL MEETING ON ADVANCES IN THERMAL HYDRAULICS

CONTE 2019: CONFERENCE ON NUCLEAR TRAINING AND EDUCATION: A BIENNIAL INTERNATIONAL FORUM
FEB 5-7, 2019 | St. Augustine, FL | World Golf Village Renaissance St. Augustine Resort

11TH NUCLEAR PLANT INSTRUMENTATION, CONTROL AND HUMAN-MACHINE INTERFACE TECHNOLOGIES (NPIC&HMIT) 2019
FEB 9-14, 2019 | Orlando, FL

NUCLEAR AND EMERGING TECHNOLOGIES FOR SPACE (NETS) 2019
FEB 25-27, 2019 | Richland, WA

INTERNATIONAL HIGH-LEVEL RADIOACTIVE WASTE MANAGEMENT 2019 (IHLRWM 2019)
APR 14-18, 2019 | Knoxville, TN | Knoxville Convention Center

2019 INTERNATIONAL TOPICAL MEETING ON PROBABILISTIC SAFETY ASSESSMENT AND ANALYSIS (PSA 2019)
APR 28-MAY 3, 2019 | Charleston, SC | Charleston Marriott

2019 ANS ANNUAL MEETING
JUN 9-13, 2019 | Minneapolis, MN | Hyatt Regency Minneapolis

UTILITY WORKING CONFERENCE AND VENDOR TECHNOLOGY EXPO
AUG 4-7, 2019 | Amelia Island, FL | Omni Amelia Island Plantation

19TH INTERNATIONAL CONFERENCE ON ENVIRONMENTAL DEGRADATION OF MATERIALS IN NUCLEAR POWER SYSTEMS - WATER REACTORS
AUG 18-22, 2019 | Boston, MA | Seaport Hotel & World Trade Center

18TH INTERNATIONAL TOPICAL MEETING ON NUCLEAR REACTOR THERMAL HYDRAULICS
AUG 18-22, 2019 | Portland, OR | Marriott Portland Downtown Waterfront

M&C 2019
AUG 25-29, 2019 | Portland, OR | Marriott Portland Downtown Waterfront

GLOBAL/TOP FUEL 2019
SEP 22-27, 2019 | Seattle, WA | The Westin Seattle