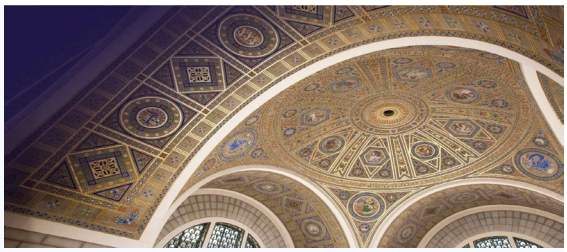
NATIONAL ACADEMIES Sciences Engineering Medicine

Nuclear and Radiation Studies Board | Division on Earth and Life Studies

45th Meeting of the Nuclear and Radiation Studies Board
September 26, 2024, Keck 201
Hybrid Meeting (In-Person & Virtual)

Agenda for Open Session

PUBLIC AGENDA



Click here to join OPEN Sessions.

Meeting ID 959 0961 1012 **Passcode** N/A

Phone

US: +1 470 250 9358 or +1 646 518 9805 or +1 646 558 8656 or +1 651 372 8299 or +1 301 715 8592 or +1 312 626 6799 or +1 602 753 0140 or +1 669 219 2599 or +1 669 900 6833 or +1 720 928 9299 or +1 971 247 1195 or +1 213 338 8477 or +1 253 215 8782 or 877 853 5257 (Toll Free) or 888 475 4499 (Toll Free)

THURSDAY, SEPTEMBER 26, 2024 (ALL TIMES LISTED ET)
KECK 201

NOTE: The Keck Café is now open where members of the public may purchase items from the hot entrees, salad bar, soups, sandwiches, desserts, and beverages. The café is open from 7:30 AM to 2:00 PM on the 3rd floor, while grab and go "market offerings" will be available for purchase outside of normal café hours. All purchases will be made at self-check kiosks—no cash, ONLY credit/debit cards are accepted.

***OPEN SESSION 1 (of 1)* – Zoom link to join OPEN Session**

1:05 pm – 2:05 pm **Applying Sustainable Principles and Practices in Radioactive Waste Management and Nuclear Decommissioning**

Discussion Moderators: *Paul Dickman and Monica Regalbuto*, NRSB Board Members

Craig Ashton, Integrated Waste Management Portfolio Director, Nuclear Waste Services (UK) (CONFIRMED)
Patricia Bekhuis, Radiation Protection Expert, Department Safety and the Environment, Dutch National Institute for Public Health and the Environment (RIVM) (The Netherlands) (CONFIRMED)
Arne Larsson, Technology Manager, Strategies and Partnerships, Cyclife (Sweden) (CONFIRMED)

2:05 pm – 3:05 pm **Nuclear fusion and Proliferation Risks**

Discussion Moderator: *Allison Macfarlane*, NRSB Board Member

Alexander Glaser, Ph.D., Associate Professor, School of Public and International Affairs and Department of Mechanical and Aerospace Engineering, Princeton University (CONFIRMED)
Sara A. Pozzi, Ph. D., University Diversity and Social transformation Professor, Professor of Nuclear Engineering and Radiological Sciences and Professor of Physics, Director, Consortium for Monitoring, Technology, and Verification Director of Diversity, Equity, and Inclusion - College of Engineering, University of Michigan (CONFIRMED)
Philipp Sauter, Dipl.-Jur., Maître en droit, M.Sc., Research Fellow, Max-Planck-Institute for Comparative Public Law and International Law (CONFIRMED)

3:05 pm – 3:15 pm **Intermission break**

3:15 pm – 4:30 pm **Alpha Theranostic Development: Isotope Production, Drug Development, and Clinical Perspectives**

Discussion Moderator: *Larry Dauer,* NRSB Board Member

Rebecca Abergel, Ph.D. Associate Professor, Departments of Nuclear Engineering and Chemistry, Associate Dean for Inclusive Excellence, College of Engineering, University of California, Berkeley / Senior Faculty Scientist, Chemical Sciences Division, Director, Glenn T. Seaborg Center, Lawrence Berkeley National Laboratory (CONFIRMED)
Lisa Bodei, MD, Ph.D., Attending and Member, Director, Radiopharmaceutical Therapy Section, Molecular Imaging and Therapy Service, Department of Radiology, Professor of Radiology, Weill Cornell Medical College of Cornell University / Nuclear Medicine Physician and Early Drug Development Specialist, Memorial Sloan Kettering Cancer Center (CONFIRMED)
Tara Mastren, Ph.D., Assistant Professor, Nuclear Engineering Program and Civil and Environmental Engineering, University of Utah
George Sgouros, Ph.D., Professor of Radiology and Radiological Science, Department of Radiation Oncology and Department of Oncology, and Director, Radiological Physics Division, Johns Hopkins Kimmel Cancer Center (CONFIRMED)

4:30 pm **ADJOURN OPEN SESSION**

SPEAKER BIOGRAPHIES

Rebecca Abergel* is an Associate Professor in the Departments of Nuclear Engineering and Chemistry at UC Berkeley and the Heavy Element Chemistry Group Leader within the Lawrence Berkeley National Laboratory's Chemical Sciences Division. The multidisciplinary research undergone in Abergel's group is at the interface of coordination chemistry, nuclear chemistry, radiochemistry, photo physics, chemical biology, health physics, pharmacology, and molecular and cellular biology. The

*Biosketch approval is pending.

group studies the effects of heavy element and inorganic isotope exposure and contamination on different biological systems in addition to the coordination chemistry and metabolic properties of lanthanide and actinide complexes formed with synthetic and biological ligands. Goals are to gain a better understanding of the biological coordination chemistry and toxicity mechanisms of the f-elements and to develop specific strategies for decontamination, waste management, remediation, separation, and radiopharmaceutical development. Abergel also leads a large collaborative effort on the development of new drug products for the treatment of populations contaminated with heavy metals and radionuclides. One of these products was granted an Investigational New Drug status from the U.S. Food and Drug Administration in 2014 and is now entering a Phase I clinical trial.

Craig Ashton has more than 20 years' experience working across operational, strategic and programme roles at Sellafield Ltd., LLWR Ltd. and the Nuclear Decommissioning Authority (NDA). He holds a Doctorate in Sustainability and nuclear regulation, is a Chartered Environmentalist and Fellow of the Institute of Environmental Management and Assessment. He was instrumental in establishing the waste diversion services at LLWR before taking overall leadership of the Waste Services department in 2016, which culminated in the diversion of more than 90% low level waste from disposal at the LLWR. This was followed by a secondment to the NDA where he led the implementation of the new Magnox reactor decommissioning strategy and assurance of both the Magnox and Dounreay lifetime plans prior to PBO contract cessation. He has recently returned to a role establishing new portfolio arrangements for the NDA group to facilitate delivery of national waste change initiatives.

Patricia Bekhuis is a radiation protection expert at the National Institute for Public Health and the Environment (RIVM). RIVM provides science-based advice to regulators in the Netherlands. Patricia Bekhuis has more than 20 years' experience in various fields of radiation protection. In recent years she has been focusing on radioactive waste and clearance in relation to the circular economy. She worked on waste from dismantling cyclotron and cyclotron vaults as well as waste from NORM industries.

Lisa Bodei* is the Director of Radiopharmaceutical Therapy Section, Molecular Imaging and Therapy Service, Department of Radiology and a Professor of Radiology at Weill Cornell Medical College of Cornell University and a Director of Targeted Radionuclide Therapy at Memorial Sloan Kettering Cancer Center. At Memorial Sloan Kettering, she is a nuclear medicine physician who has extensive experience and broad expertise in therapeutic and diagnostic applications of nuclear medicine in oncology. Her past clinical and research experience has been multifaceted, and includes combining the therapeutic and diagnostic components of nuclear medicine, which is referred to as theranostics. From the therapeutic perspective, my special expertise is in the development of peptide receptor radionuclide therapy (PRRT) of gut and lung neuroendocrine tumors, including special investigational and molecular translational analyses to facilitate their diagnosis and therapy. In addition, she has substantial experience with radioiodine therapy of differentiated thyroid cancer and hyperthyroidism. She also has expertise in the utilization of systemic radioimmunotherapy for loco-regional disease, brain tumors, ovarian carcinoma, and non-Hodgkin lymphoma. In the diagnostic arena her expertise includes a broad range of diagnostic endocrine applications in nuclear medicine such as receptor scintigraphy, 68Ga-octreotide PET/TC, 18FDG-PET/CT in oncology, radio-immuno-scintigraphy, and sentinel node scintigraphy. Dr. Bodei is the author or co-author of more than 100 peer-reviewed publications, and serve on the editorial boards of several scientific journals including the Journal of Nuclear Medicine and the European Journal of Nuclear Medicine and Molecular Imaging.

Alexander Glaser is an associate professor in the School of Public and International Affairs and in the Department of Mechanical and Aerospace Engineering at Princeton University. Glaser's research involves technical and policy analysis in the areas of nuclear arms control, nuclear nonproliferation, and next-generation nuclear energy systems, including nuclear fission and fusion systems. Along with

*Biosketch approval is pending.

Harold Feiveson, Zia Mian, and Frank von Hippel, he is co-author of *Unmaking the Bomb* (MIT Press, 2014). For Princeton's work on nuclear warhead verification, Foreign Policy Magazine selected him as one of the 100 Leading Global Thinkers of 2014. In September 2020, Alex was elected a Fellow of the American Physical Society. Glaser has been co-directing Princeton's Program on Science and Global Security since 2016. Glaser holds a PhD in Physics from Darmstadt University, Germany.

Arne Larsson is currently head of Strategies and Partnerships within Cyclife Sweden AB (EDF Group) with extensive experience in the treatment of contaminated metals, radioactive waste management and decommissioning of nuclear installations. He also currently serves on the Nuclear Energy Agency's (NEA) Working Party on Technical, Environmental and Safety Aspects of Decommissioning and Legacy Management (WPTES) with the goal of addressing technical, environmental and safety issues in the decommissioning of nuclear installations and legacy management. Mr. Larsson is also Vice Chair of *nucleareurope*'s Radioactive Waste Management and Decommissioning working group, as well as a member of World Nuclear Association's (WNA) Waste Management and Decommissioning Working Group. Additionally, he was Chair of the OECD/NEA's Working Party on Decommissioning and Dismantling (WPDD) expert group on Radiological Characterisation in Decommissioning from 2011-2017.

Dr. **Tara Mastren** is an Assistant Professor in the Nuclear Engineering program at the University of Utah. She received her PhD in Chemistry from Washington University in St Louis where she began her career in the production and application of radionuclides for nuclear medicine applications. During her postdoctoral position at Los Alamos National Laboratory, she worked on the Tri Lab project between ORNL, LANL, and BNL to increase the supply of 225Ac. She moved to the University of Utah to continue working on the production and availability of alpha emitting radionuclides in addition to applying alpha emitting radionuclides for use in the targeted alpha therapy treatment of cancer and other diseases.

Professor **Sara Pozzi** is a University Diversity and Social Transformation Professor at the University of Michigan. She is the Director of the Consortium for Monitoring, Technology, and Verification and the Director of Diversity, Equity, and Inclusion - College of Engineering. She is a Professor of Nuclear Engineering and Radiological Sciences and a Professor of Physics. Her research interests include the development of new methods for nuclear materials detection, identification, and characterization for nuclear nonproliferation, safeguards, and national security programs. Her seminal contributions as a researcher and educator in computational and experimental methods in radiation measurements for nuclear security are widely recognized. Her publication record includes over 400 papers in journals and international conference proceedings. She was invited to give over 100 seminars. She has graduated 30 Ph. D. students who went on to develop successful careers at the national laboratories, academia, industry, and government. She is a Fellow of the American Nuclear Society, the Institute of Nuclear Materials Management, and the IEEE, and is an International Fellow of the Royal Swedish Academy of Engineering Sciences.

Philipp Sauter is a research fellow at the Max Planck Institute for Comparative Public Law and International Law in Germany. He holds diplomas in both law and physics. He conducts research on the legal framework of nuclear fusion with a focus on nuclear non-proliferation. He is co-secretary of Working Group 8 on Nuclear Fusion of the International Nuclear Law Association (INLA) and member of the German Federal Government's Expert Commission on Fusion Regulation.

Dr. **George Sgouros** is Professor and Director of the Radiological Physics Division in the Department of Radiology at Johns Hopkins University, School of Medicine. He is author on more than 200 peer-reviewed articles, several book chapters and review articles. He is recipient of the SNMMI Saul Hertz Award for outstanding achievements and contributions in radionuclide therapy and the 2024 recipient of

*Biosketch approval is pending.

the Paul C. Aebersold Award for outstanding achievement in basic science applied to nuclear medicine or molecular imaging. He is a member (2000-) of the Medical Internal Radionuclide Dose (MIRD) Committee of the Society of Nuclear Medicine and Molecular Imaging (SNMMI), which he chaired 2008-2019. He has chaired a Dosimetry & Radiobiology Panel at a DOE alpha-emitters workshop and also an ICRU report committee for ICRU guidance document No. 96 on dosimetry for radiopharmaceutical therapy. Dr. Sgouros is a former member (2012-2017) and chair (2015-2017) of the NIH study section on Radiation Therapeutics and Biology (RTB). Dr. Sgouros is also founder and principal of Rapid, a dosimetry and imaging services and software products start-up in support of radiopharmaceutical therapy.

*Biosketch approval is pending.