ANS Conference

8th International Conference on Isotopes and Expo

8th ICI 2014 CHICAGO

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August 24-28, 2014
Hyatt Regency-Chicago
Chicago, IL

ANS Conference

8TH International Conference on Isotopes and Expo

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President, Korean Association for Radiation Application

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Argonne National Laboratory

Assistant General Chair:
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Clear Vascular, Inc.

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Kenan Ünlü, *Pennsylvania State University, USA*

Meera Venkatesh, *International Atomic Energy Agency, Austria*

James S. Welsh, *Fermi National Accelerator Laboratory, USA*

Boris Zhuikov, *Institute for Nuclear Research of the Russian Academy of Sciences, Russia*

NOTE:
Additional tickets can be purchased at the ANS Registration Desk for the Sunday Opening Reception, and the Closing Banquet.

NOTICE FOR SPEAKERS
All Speakers and Session Chairs must sign in at the ANS Registration Desk located in the West Tower (Gold Level) outside the Regency Ballroom, during registration hours.

ANS CONFERENCE OFFICE
Location: New Orleans

ANS SPEAKER READY ROOM
Location: San Francisco

MEETING REGISTRATION
Meeting, Speaker & Exhibitor Registration will be located at the ANS Registration Desk located in the West Tower (Gold Level) outside the Regency Ballroom of the Hyatt Regency Chicago, Sunday, August 24, 2014 – Thursday, August 28, 2014. Meeting registration is required for all attendees, exhibitors and speakers. Badges are required for admission to all plenaries, technical sessions and events.

REGISTRATION HOURS
Sunday, August 24, 2014
12:00 pm – 8:00 pm

Monday, August 25, 2014
7:00 am – 6:00 pm

Tuesday, August 26, 2014
7:00 am – 6:00 pm

Wednesday, August 27, 2014
7:00 am – 6:00 pm

Thursday, August 28, 2014
7:00 am – 12:00 pm

SPECIAL EVENTS

Opening Reception
Sunday, August 24, 2014
6:00 PM – 8:00 PM
Location: Regency A-D

A welcome reception will follow the Opening Plenary. One ticket to the Welcome Reception is included with the full meeting registration.

Additional tickets can be purchased at the ANS Registration Desk for $120.00 each.

Conference Banquet
Wednesday, August 27, 2014
7:30 PM – 10:00 PM
Location: Crystal Ballroom

Additional tickets can be purchased at the ANS Registration Desk for $140.00 each.

TECHNICAL TOURS

Argonne National Laboratory
Thursday, August 28, 2014
12:30 PM – 4:30 PM
Location: Argonne National Laboratory

The tour will include a visit to the Advanced Photon Source, the New Brunswick Laboratory (NBL), and the Nuclear Energy Exhibit, which showcases ANL's heritage of nuclear reactor designs.

Please note required tour attire: long pants and flat, closed-toe shoes.

Tickets can be purchased at the ANS Registration Desk for $45.00 each. Limited seating.

Fermi National Accelerator Laboratory
Thursday, August 28, 2014
12:30 PM – 5:30 PM
Location: Fermi National Laboratory

The laboratory is dedicated to exploring the three frontiers of high-energy physics, and is the only national laboratory dedicated to the study of particle physics. Currently, FermiLab is building the nation's most advanced test facility for superconducting radio-frequency technology. This innovative technology will serve as the model for next-generation accelerators and is the future of particle physics.

Please note required tour attire: flat, closed-toe shoes.

Tickets can be purchased at the ANS Registration Desk for $45.00 each. Limited seating.

OPENING PLENARY

A tribute to Heino Nitsche, University of California-Berkeley and Lawrence Berkeley National Laboratory.

"In memoriam: Heino Nitsche"
Darleane Hoffman — Professor Emerita, *(Univ of California, Berkeley),* Annie B. Kersting *(LLNL)*

"Challenges for the Next Generations: Dispelling the Ghosts of TMI, Chernobyl, Fukushima, and Nuclear Terrorism"
Dale E. Klein, Associate Vice-Chancellor, University of Texas Systems and Former NRC Chairman

"The Importance of the Government's Role on the Establishment of a Radioisotope Supply Chain"
Jong Kyung Kim *(Korean Atomic Energy Research Institute, Korea)*

MARIE CURIE PLENARY

"Celebrating a Century of Women in Nuclear Science"
Join 8ICI Chairman Paul Dickman for a special session that focuses on the role of women in advancing nuclear science. A century ago, research physicist and chemist Marie Curie founded the Curie Institute. The advent of World War I changed the center's focus from research to applied nuclear technology. Today, the role of women in the field of nuclear sciences is expanding, changing the way the public perceives the field. This plenary will include presentations and a panel discussion with:
Jean-Louis Alberini, Director of Nuclear Medicine *(Curie Institute)*
Janice Dunn-Lee, Deputy Director General *(IAEA)*
Darleane Hoffman, Professor Emerita, *(Univ of California–Berkeley)*
And other notable speakers.

WCI PRESIDENT'S FORUM

"The Public Health Dilemma: Balancing Isotope Supply and Safety and Security"
Join WCI President Myung-Chul Lee and incoming WCI President Vanzyl de Villiers for special forum on policies that may affect future supplies of isotopes. The modern world needs isotopes for public health and prosperity, however increasing concerns about safety and non-proliferation are changing how the market meets these needs. This forum is an extraordinary opportunity for 8ICI attendees to hear from top governmental officials and senior policy makers on emerging issues and their concerns and thoughts about the future. This plenary will include presentations and a panel discussion with:
Ramzi Jammal, Executive Vice-President and Chief Regulatory Officer *(Canadian Nuclear Safety Commission)*
Jong-Kyung Kim, President, Korean Atomic Energy Research Institute *(KAERI);* Secretary General *(World Council on Isotopes)*
Allison Macfarlane, Chairman *(Nuclear Regulatory Commission)*
Chris Whipple, ENVIRON Principal, Chair *(NAS Committee on Medical Isotope Production without HEU)*

PLENARY SPEAKERS

Ilham Y. Al-Qaradawi — *Qatar University (Qatar)*
Applications of Positron Annihilation Techniques
Jean-Louis Alberini — *Institut Curie (Paris and Saint-Cloud, France)*
Radium: From Discovery by Marie Curie to Medical Applications
Darren Brown — *Trace Sciences International Corporation (Canada)*
Stable Isotope Enrichment Methods – Historical Review and Future Trends
Ron Cameron — *OECD-NEA (France)*
Economics of Radioisotope Production and Sustainability
Richard Ferrieri — *Brookhaven National Laboratory (United States)*
Radiometric Fluxomics: A New Era for Quantitative Plant Biology
Joanna S. Fowler — *Brookhaven National Laboratory (United States)*
Rapid Radiotracer Chemistry and Imaging the Human Brain
Marc A. Garland — *US Department of Energy (United States)*
Isotope Production and Research at the US Department of Energy
Darleane C. Hoffman — *University of California–Berkeley (United States)*
The Role of Periodic Tables in the Discovery of New Elements
Ramzi Jammal — *Canadian Nuclear Safety Commission (Canada)*
WCI President's Forum
Silvia S. Jurisson — *University of Missouri Research Reactor (MURR) (United States)*
Current Directions in Diagnostic and Therapeutic Radiopharmaceuticals
Annie Kersting — *Lawrence Livermore National Laboratory (United States)*
Biogeochemical Process Controlling the Transport of Plutonium in the Environment
Jong Kyung Kim — *Korean Atomic Energy Research Institute (Korea)*
The Importance of the Government's Role on the Establishment of a Radioisotope Supply Chain
Dale E. Klein — Associate Vice-Chancellor, University of Texas Systems and Former NRC Chairman
"Challenges for the Next Generations: Dispelling the Ghosts of TMI, Chernobyl, Fukushima, and Nuclear Terrorism"
Suzanne Lapi — *Washington University School of Medicine (United States)*
Cyclotron Production and Imaging Applications of Positron Emitting Radiometals
Janice Dunn-Lee — *International Atomic Energy Agency (International)*
The Next Marie Curie: The Role of the IAEA in Advancing Women in Nuclear Science
Allison Macfarlane — *Nuclear Regulatory Commission (United States)*
WCI President's Forum
Alfred Morgenstern — Joint Research Centre Institute for Transuranium Elements *(Germany)*
Targeted Alpha Therapy with Ac-225 and Bi-213
Adrian (Adi) Paterson — *Australian Nuclear Science and Technology Organization (Australia)*
Isotope Development in the Australian Setting
Tim Payne — *Australian Nuclear Science and Technology Organization (Australia)*
Emerging Applications of Nuclear and Isotopic Techniques in the Environmental Sciences
Syed M. Qaim — *Forschungszentrum Juelich (Germany)*
Nuclear Data for Medical Isotopes
Thomas Ruth — *TRIUMF (Canada)*
Accelerator-Based Production of Mo-99
Andreas Türler — *Paul Scherrer Institute, and Bern University (Switzerland)*
Heavy and Superheavy Element Research
Suresh Srivastava — *Brookhaven National Laboratory (United States)*
Transforming the Playing Field: Personalized Medicine with the Use of Theragnostic Radiopharmaceuticals
Aleksey Vakulenko — *JSC Isotope (Russia)*
Production Capacities of ROSATOM Isotope Complex
Henry VanBrocklin — *University of California–San Francisco School of Medicine, Radiology and Biomedical Imaging (United States)*
The Future of Molecular Imaging: A Radiochemist's Perspective
Meera Venkatesh — *International Atomic Energy Agency (International)*
Radioisotopes and Radiation Technology in Industry
Chris Whipple — *ENVIRON (United States)*
WCI President's Forum

SUNDAY, AUGUST 24, 2014

12:00 pm - 8:00 pm	Registration
12:00 pm - 4:00 pm	Exhibit Setup
4:00 pm - 6:00 pm	Opening Plenary
6:00 pm - 8:00 pm	Welcome Reception
6:00 pm - 8:00 pm	Exhibition and Posters

MONDAY, AUGUST 25, 2014

7:00 am - 6:00 pm	Registration
8:00 am - 9:40 am	General Plenary—I
9:30 am - 3:30 pm	Exhibition and Posters
9:40 am - 10:10 am	Refreshment Break in Expo
10:10 am - 11:50 am	General Plenary—II
1:00 pm - 3:00 pm	Technical Sessions

- *Reactor-Based Production of Mo-99—I*
- *Applications in Nuclear Medicine—Therapeutics*
- *Calibration Methods, Fundamental Nuclear Data, and Airborne Effluents from Medical Isotope Production*
- *Production of Non-PET Radionuclides*
- *Reference Materials for Nuclear Mass Spectrometry/Nuclear Analysis, Session to the Honour of Dr. Stefan Buerger*

3:00 pm - 3:30 pm	Refreshment Break in Expo
3:30 pm - 7:00 pm	Technical Sessions

- *Reactor-Based Production of Mo-99—II*
- *CW Electron Linac Technology for Radioisotope Development and Production- Round Table Discussion*
- *Theragnostics/Personalized Medicine*
- *Application of Nuclear Techniques to National Security and Treaty Monitoring*
- *Isotope Devices, Isotope Tracers and Other Applications*
- *Quality Assurance Topics in Radioanalytical and Radiopharmaceutical Chemistry Papers /Panel*

TUESDAY, AUGUST 26, 2014

7:00 am - 6:00 pm	Registration
8:00 am - 9:50 am	Marie Curie Commemorative Session–Panelists/Paper
9:30 am - 3:30 pm	Exhibition and Posters
9:50 am - 10:10 am	Refreshment Break in Expo
10:10 am - 12:25 pm	Marie Curie Plenary Session

1:00 pm - 3:00 pm	Poster Discussion A and Refreshment Break
3:00 pm - 6:30 pm	Technical Sessions

- *Accelerator-Based Production of Mo-99*
- *Applications in Nuclear Medicine—Diagnostics*
- *Radiopharmaceutical Chemistry*
- *Reactor Production of Medical Isotopes*
- *Production of Stable Isotopes*
- *Stable Isotopes in Materials and Environmental Research*
- *Nuclear Data for Medical Isotopes*
- *Environmental Fate and Identification of Radionuclides*

WEDNESDAY, AUGUST 27, 2014

7:00 am - 6:00 pm	Registration
8:00 am - 9:40 am	Isotope Research Plenary
9:30 am - 3:00 pm	Exhibition and Posters
9:45 am -10:10 am	Refreshment Break in Expo
10:10 am -12:00 pm	World Council on Isotopes President's Forum
1:00 pm - 3:00 pm	Poster Discussion B and Refreshment Break
3:00 pm - 6:20 pm	Technical Sessions

- *Production of Pet Radionuclides*
- *Economics of Radioisoptope Production and Sustainabilty–Papers/Panel*
- *Securing the Supply of Isotopes in the Future–Papers/Panel*
- *Medium and High Energy Accelerator/Cyclotron Production of Isotopes*
- *Separation Chemistry and Target Preparation for Nuclear Chemistry Experiments*
- *Heavy and Superheavy Elements Research*
- *Isotopes in Plant Biology: Future Sustainability in Energy and Agriculture—I*

7:30 pm - 10:00 pm	Conference Banquet

THURSDAY, AUGUST 28, 2014

7:00 am - 12:00 pm	Registration
8:00 am - 10:20 am	Technical Sessions

- *Isotope Recovery and Reclamation*
- *Production and Application of Alpha Emitters*
- *Isotopes in Plant Biology: Future Sustainability in Energy and Agriculture—II*
- *Applications of Research and Industrial Isotopes*

10:20 am - 12:00 pm	Closing Plenary
12:30 pm - 4:30 pm	Argonne National Laboratory Technical Tour
12:30 pm - 5:30 pm	Fermi National Accelerator Laboratory Technical Tour

OPENING SESSION

Session Organizers: Paul T. Dickman *(ANL),* Rolf Zeisler *(NIST),* Stephen P. LaMont *(LANL)*
Cochairs: Paul T. Dickman *(ANL),* Stephen P. LaMont *(LANL)*

Crystal Ballroom – 4:00 p.m.

WELCOMING REMARKS

Paul T. Dickman, General Chair
Myung-Chul Lee, President WCI
Peter Littlewood, Director Argonne National Laboratory
Donald Hoffman, Past President ANS

TRIBUTE TO HEINO NITSCHE

As we are saddened by the premature death of Heino Nitsche on July 15, 2014, his invited keynote lecture *"The Isotopes Story: From the Curies to Element 118"* regrettably will not set the stage for the 8th International Conference on Isotopes. We wish to honor his support and dedication to the isotope science and technology with this tribute.

Darleane Hoffman *(Univ of California, Berkeley),* Annie B. Kersting *(LLNL)*

"In memoriam: Heino Nitsche"

PLENARY LECTURES

Dale E. Klein, Associate Vice-Chancellor, University of Texas Systems and Former NRC Chairman

"Challenges for the Next Generations: Dispelling the Ghosts of TMI, Chernobyl, Fukushima, and Nuclear Terrorism"

Jong Kyung Kim *(Korean Atomic Energy Research Institute, Korea)*

"The Importance of the Government's Role on the Establishment of a Radioisotope Supply Chain"

OPENING RECEPTION

Regency Ballroom – 6:00 p.m..-8:00 p.m.

ISOTOPES GENERAL PLENARY—I

Session Organizers: Paul T. Dickman *(ANL),* Rolf Zeisler *(NIST),* Stephen P. LaMont *(LANL)*
Cochairs: Dale Klein *(UT System),* Jong-Kyung Kim *(KAERI)*

Crystal B – 8:00 a.m.

8:00 a.m.
Economics of Radioisotope Production and Sustainability, Ron Cameron *(OECD Nuclear Energy Agency),* invited

8:25 a.m.
Isotope Developments in the Australian Setting, Adi Paterson, Karina Meredith, Quan Hua *(ANSTO),* invited

8:50 a.m.
Production Capacities of ROSATOM Isotope Complex, Aleksey Vakulenko *(JSC Isotope),* invited

9:15 a.m.
U.S. Department of Energy Isotope Production and Research, Marc A. Garland *(DOE),* invited

REFRESHMENT BREAK IN EXPO

Regency Ballroom – 9:40 a.m.-10:10 a.m.

ISOTOPES GENERAL PLENARY—II

Cochairs: Adi Paterson *(ANSTO),* Werner Lutze, *(Catholic University)*

Crystal B – 10:10 a.m.

10:10 a.m.
Stable Isotope Enrichment Methods—Historical Review and Future Trends, Darren Brown *(Trace Sciences International),* invited

10:35 a.m.
Radioisotopes and Radiation Technology in Industry, Meera Venkatesh, Patrick Brisset, Sunil Sabharwal, Agnes Safrany *(IAEA),* invited

11:00 a.m.
Transforming the Playing Field; Personalized Medicine Using Theragnostic Radiopharmaceuticals, Suresh C. Srivastava *(BNL),* invited

11:25 a.m.
Accelerator-Based Production of Mo-99, Thomas J. Ruth *(TRIUMF/BC Cancer Agency),* invited

REACTOR-BASED PRODUCTION OF MO-99—I

Session Organizers: Natesan Ramamoorthy *(BARC),* James S. Welsh *(NIU Inst for Neutron Therapy)*
Cochairs: Natesan Ramamoorthy *(BARC),* Carmen Bigles *(Coquí Radio Pharmaceuticals Corp.)*

Crystal A – 1:00 p.m.

1:00 p.m.
Improvements to Production and Supply of LEU Molybdenum, Mark Moore, Aaron Flett *(ANSTO),* invited

1:20 p.m.
Future U.S. Supply of Mo-99 Production Through Fission Based LEU/LEU Technology, James Welsh, Carmen I. Bigles-Raldiris, Alejandro Valderrabano *(Coquí RadioPharmaceuticals Corp.),* invited

1:40 p.m.
A Small Reactor Design for ^{99}Mo Production with Novel Fuel, Gary Stange *(Univ of Wisconsin, Madison)* Thomas Mackie *(Univ of Wisconsin, Madison, Morgridge Inst for Research)* Michael Corradini *(Univ of Wisconsin, Madison)*

1:55 p.m.
A Novel Micro-Porous Sorbent for ^{99}Mo/+Tc Generator Using (n,γ) ^{99}Mo, Lou Centofanti, Tom Yarbrough, Robert J. Schreiber, Sally McQuaid, Shameem Hasan *(Perma-Fix Environmental Services Inc.)*

2:10 p.m.
Metallurgical Considerations for the Fabrication of LEU Dispersion Targets with a High Uranium Density for Mo-99 Production, Ho Jin Ryu *(KAIST),* Yong Jin Jeong, Ji Min Nam, Jong Man Park *(KAERI)*

2:25 p.m.
Options for the Separation of Medical Isotope Molybdenum-99 from Low Enriched Uranium Solutions, A. S. Anderson, R. Copping, G. E. Dale, D. A. Dalmas, M. J. Gallegos, L. A. Hudson, C. T. Kelsey IV, I. May, S. D. Reilly, D. Rios, F. H. Stephens, F. L. Taw, K. A. Woloshun *(LANL)*

2:40 p.m.
Six Problems with the Six-Day Curie and a Solution, Adi Paterson, Michael Druce, Elizabeth Killen *(ANSTO)*

APPLICATIONS IN NUCLEAR MEDICINE—THERAPEUTICS

Session Organizers: Meera Venkatesh *(IAEA),* Bryan P. Bednarz *(Univ of Wisconsin, Madison)*
Cochairs: Silvia Jurisson *(Washington Univ, St. Louis),* Adriano Duatti *(IAEA)*

Acapulco – 1:00 p.m.

1:00 p.m.
Dosimetry-Based Treatment Planning: Personalized Medicine in Radiopharmaceutical Therapy, Robert Hobbs *(Johns Hopkins Univ),* invited

1:20 p.m.
Merging Therapeutic and Diagnostic Imaging: Phospholipid Ether-Based Targeting Approaches for Broad Spectrum Cancer Detection and Treatment, Joseph Grudzinski (*Univ of Wisconsin, Madison/Cellectar Biosciences, Inc.),* invited

1:40 p.m.
Towards Multiscale Personalized Dosimetry for Diapeutic Radiopharmaceuticals, Bryan Bednarz, Abigail Besemer *(Univ of Wisconsin, Madison),* Joseph Grudzinski *(Univ of Wisconsin, Madison/Cellectar Biosciences, Inc.)* Benjamin Titz *(Cellectar Biosciences),* Paul Wickre *(Univ of Wisconsin, Madison),* Jamey Weichert *(Univ of Wisconsin, Madison/Novelos Therapeutics, Inc.),* Lance Hall *(Univ of Wisconsin, Madison),* invited

2:00 p.m.
Preparation and Evaluation of Sn-117m Annexin for Vulnerable Plaque, Jaime Simón, Jason A. Rogers, George M. St. George, R. Keith Frank, Scot H. Ellebracht *(IsoTherapeutics Group, LLC),* Nigel R. Stevenson, David W. Mueller, Gilbert R. Gonzales *(Clear Vascular, Inc.)*

2:20 p.m.
CycloSam® Sm-153 DOTMP, A New Therapeutic Bone Agent, Jaime Simón, R. Keith Frank, Prakash U. Bakhru *(IsoTherapeutics Group LLC),* Richard E. Wendt *(Univ of Texas M.D. Anderson Cancer Center),* Jimmy C. Lattimer, Kim A. Selting, Alan R. Ketring *(Univ of Missouri)*

2:40 p.m.
Antitumor Effect of Radioactive CISPLATIN (^{195m}Pt) Produced by Photonuclear Method, E. Bodnar *(Trauma Risk Management Research Inst),* N. Dikiy, E. Medvedev *(Kharkov Inst of Physics and Technology)*

CALIBRATION METHODS, FUNDAMENTAL NUCLEAR DATA, AND AIRBORNE EFFLUENTS FROM MEDICAL ISOTOPE PRODUCTION

Session Organizer: Steven R. Biegalski *(Univ of Texas, Austin)*
Cochairs: Steven R. Biegalski *(Univ of Texas, Austin),* Derek Haas *(PNNL)*

Hong Kong – 1:00 p.m.

1:00 p.m.
Calibrating a New Generation of Field Nuclear Measurements for Treaty Inspections, Derek A. Haas, Matthew W. Cooper, Justin I. McIntyre, Theodore W. Bowyer, James C. Hayes, Harry S. Miley, Amanda M. Prinke, Michael P. Foxe, Justin D. Lowrey, Craig E. Aalseth, Allen Seifert, Richard M. Williams, Robin A. Riedmann *(PNNL),* invited

1:20 p.m.
Electron-Photon Coincidence Decay of ^{127}Xe, Franziska J. Klingberg, Steven R. Biegalski *(Univ of Texas, Austin),* Derek Haas, Amanda Prinke *(PNNL)*

1:40 p.m.
Determination of Short-Lived Fission Product Yields with Gamma Spectrometry, Kenneth Dayman, Steven R. Biegalski *(Univ.of Texas, Austin),* Derek Haas *(PNNL)*

2:00 p.m.
Radioxenon Measured and Predicted Detections from Southern Hemisphere Medical Isotope Production Facilities, Justin D. Lowrey, Paul W. Eslinger, Brian T. Schrom, Judah I. Friese, Derek A. Haas, Harry S. Miley *(PNNL)*

2:20 p.m.
Stack Monitoring at the BatanTeknologi Medical Isotope Production Facility, J. I. McIntyre, I. M. Cameron *(PNNL),* J. Dumais *(BATAN, National Nuclear Energy Agency),* P. W. Eslinger *(PNNL),* A. Gheddou *(CTBTO),* A. Gusbudiman, P. Marsoem *(BATAN, National Nuclear Energy Agency),* H. S. Miley *(PNNL),* M. Nikkinen *(CTBTO),* A. M. Prinke, M. D. Ripplinger, B. D. Schrom *(PNNL),* U. Stoehlker *(Federal Office for Radiation Protection),* G. Suhariyono *(BATAN, National Nuclear Energy Agency),* G. A. Warren *(PNNL),* S. Widodo *(BATAN, National Nuclear Energy Agency),* V. T. Woods *(PNNL)*

2:40 p.m.
Local Transport of Radioxenon Released from the Chalk River Laboratories Medical Isotope Facility, Christine Johnson, Steven R. Biegalski *(Univ of Texas, Austin),* Justin Lowrey, Derek Haas *(PNNL)*

PRODUCTION OF NON-PET RADIONUCLIDES

Session Organizers: Nigel R. Stevenson *(Clear Vascular, Inc.),* Flavia Groppi *(U and INFN Milano)*
Cochairs: Nigel Stevenson *(Clear Vascular, Inc.),* Flavia Groppi *(U and INFN Milano)*

Toronto – 1:00 p.m.

1:00 p.m.
Methods of Producing High Specific Activity SN-117M with Commercial Cyclotrons, Nigel Stevenson *(Clear Vascular, Inc.),* invited

1:20 p.m.
The Past, Present and Future of Cyclotron-Based Large Scale SPECT Radioisotopes Production, Jean-Michel Geets, Sylvain Savaria *(IBA),* invited

1:40 p.m.
Cyclotron Production of SPECT Isotopes, Jozef Orzechowski *(TRIUMF),* Jerry Porter *(Nordion),* invited

2:00 p.m.
Isotope Production Using Automated Separation of Irradiated Liquid Targets, George M. St. George, Jaime Simón *(IsoTherapeutics Group LLC),* Nigel Stevenson *(TcNet LLC)*

2:15 p.m.
Building on TR-24 Success—ACSI Launches a New Cyclotron Model, Russell Watt, William Gyles, Alexander Zyuzin, Markus Pauli *(Advanced Cyclotron Systems Inc.)*

2:30 p.m.
Linac Production of Cu-67: Design, Production, and Separation, David A. Rotsch, David A. Ehst, Nicholas A. Smith, Vahko Makarashvili, Andrew S. Hebden *(ANL)*

2:45 p.m.
Production of High Specific Activity ^{186}Re for Cancer Therapy Using WO_3 Targets in a Proton Beam, M. E. Fassbender, M. D. Gott, J. W. Engle, E. R. Birnbaum, K. D. John, J. R. Maassen, F. M. Nortier *(LANL),* J. W. Lentz *(John Lenz & Assoc),* C. S. Cutler, A. R. Ketring, S. S. Jurisson *(Univ of Missouri, Columbia),* D. S. Wilbur *(Univ of Washington)*

3:00 p.m.
Isotope Production and Clinical Research at the University of Washington Clinical Cyclotron, Eric Dorman, Robert Emery, *(Univ of Washington School of Medicine)*

REFERENCE MATERIALS FOR NUCLEAR MASS SPECTROMETRY/NUCLEAR ANALYSIS SESSION TO THE HONOUR OF DR. STEFAN BUERGER

Session Organizers: Stephan Richter *(EC JRC),* Jacqueline L. Mann *(NIST)*
Cochairs: Stephan Richter *(EC JRC),* Jacqueline Mann *(NIST)*

Crystal C – 1:00 p.m.

1:00 p.m.
To the Memory of Stefan Buerger, Sergei Boulyga *(IAEA),* invited

1:10 p.m.
Implementation of MC-ICP-MS for Bulk Analysis of Environmental Samples at IAEA Safeguards Analytical Laboratories, Sergei Boulyga, Andreas Koepf, Zsuzsanna Macsik *(IAEA),* invited

1:30 p.m.
New Uranium Isotopic Synthetic Calibration Mixes and Recertification of NBL U-Series CRMS, Rebecca B. Thomas Richard Essex, Colleen Gradle *(DOE–New Brunswick Lab),* invited

1:50 p.m.
Recently Certified Reference Materials from New Brunswick Laboratory, Kattathu J. Matthew, Richard Essex, Colleen Gradle *(DOE–New Brunswick Lab),* invited

2:10 p.m
Certification of Uranium Hexafluoride Reference Materials for Isotopic Composition, S. Mialle, S. Richter, C. Hennessy, J. Truyens, U. Jacobsson, Y. Aregbe *(EC-JRC-IRMM)*

2:25 p.m.
Reference Materials for Nuclear Forensics, Jacqueline Mann *(NIST),* Richard Essex, Paul Croatto *(New Brunswick Lab),* Jeffrey Morrison *(U.S. Department of Homeland Security)*

2:40 p.m.
Preparation of High Purity Isotopic Reference Standards for Isotope Dilution Mass Spectrometry, J. J. Horkley, K. P. Carney, E. M. Gantz, T. S. Grimes, R. R. Lewis, J. P. Crow, C. A. Poole, J. J. Giglio, M. R. Finck *(INL)*

REFRESHMENT BREAK IN EXPO

Regency Ballroom – 3:00 p.m.-3:30 p.m.

REACTOR-BASED PRODUCTION OF MO-99—II

Session Organizers: Natesan Ramamoorthy *(HBNI),* James S. Welsh *(NIU Inst for Neutron Therapy)*
Cochairs: James Welsh *(NIU),* Rostislav Kuznetsov *(JSC "SSC RIAR")*

Crystal A – 3:30 p.m.

3:30 p.m.
Scope and Need for Reducing Over-Dependence on Fission-Based ^{99}Mo/ ^{99m}Tc-: An Analysis, N. Ramamoorthy *(BARC),* invited

3:50 p.m.
ANSTO Nuclear Medicine—Towards a Stable Supply of Mo-99, Michael Druce, Mark Moore *(ANSTO)*

4:05 p.m.
LEU-Based Fission Mo-99 Process with Facile Solid Wastes, Seung-Kon Lee, Suseung Lee, Sung-Hee Jung, Soon-Bog Hong, Kyung-Duk Jang, Sang Mu Choi, Jun Sig Lee, In-Cheol Lim *(KAERI)*

4:20 p.m.
Mo-99 Production in RIAR: Status and Conversion Planning, R. A. Kuznetsov, A. M. Svyatkin, A. L. Izhutov, V. A. Starkov, A. N. Pakhomov *(JSC "SSC RIAR")*

4:35 p.m.
Dynamic System Simulation of Fissile Solution Systems, Robert Kimpland, Steven Klein *(LANL)*

4:50 p.m.
Nuclear Design of the KIJANG Research Reactor for Radio-Isotope Production and Silicon Doping, Hong-Chul Kim, Chul Gyo Seo, Hee Taek Chae *(KAERI)*

CW ELECTRON LINAC TECHNOLOGY FOR RADIOISOTOPE DEVELOPMENT AND PRODUCTION–ROUND TABLE DISCUSSION

Session Organizer and Chair: Ganapati Rao Myneni *(Jefferson Lab)*

Crystal A – 5:05 p.m.

Traditional radioisotope production technologies include nuclear reactors, Cyclotrons and proton linacs. However, new and innovative techniques are necessary in radioisotope production to address the issue of isotope shortage for medical applications as well as to develop uses for industrial, security and R&D purposes. Photonuclear reaction is another avenue that offers unique advantage in the development of radioisotopes. Jefferson Lab's continuous wave superconducting radio frequency (SRF) electron linac technology is expected to provide new impetus to the radioisotopes development and their eventual economic production. This round table discussion will explore the new opportunities with photonuclear processes.

PANELISTS:

- Ganapati Myneni *(Jefferson Lab)*
- Thomas Ruth *(TRIUMF)*
- Andrew Weisenberger *(Jefferson Lab)*
- Doug Wells *(South Dakota School of Mines & Technology)*
- Jamal Zweit *(Virginia Commonwealth Univ)*

THERAGNOSTICS/PERSONALIZED MEDICINE

Session Organizers: Flavia Groppi *(LASA),* Suresh Srivastava *(BNL)*
Cochairs: Suresh Srivastava *(BNL),* Jean-Louis Alberini *(Institut Curie)*

Acapulco – 3:30 p.m.

3:30 p.m.
Theragnostic Radiopharmaceuticals for the Imaging Plus Treatment of Cancer and Other Inflammatory Disease, Suresh C. Srivastava (*BNL),* Nigel R. Stevenson *(Clear Vascular, Inc.),* invited

3:50 p.m.
Multifunctional Radionanomedicine: A New Theranostic Approach, F. Groppi, M.L. Bonardi, S. Manenti, L. Gini *(Università degli Studi di Milano & INFN),* E. Sabbioni *(ECSIN Veneto Nanotech),* invited

4:10 p.m.
New Radioisotopes for Innovative Theranostic Approach in Nuclear Medicine, Mickaël Bourgeois *(Arronax Cyclotron/CRCNA/CHU Nantes),* Mathieu Frindel *(CRCNA/CHU Nantes),* Ferid Haddad *(Arronax Cyclotron),* Michel Cherel *(CRCNA),* Jacques Barbet *(Arronax Cyclotron),* Alain Faivre-Chauvet *(CRCNA/CHU Nantes),* invited

4:30 p.m.
Preliminary Production of Ac-225 by Spallation Reaction on Th-232, Leonard F. Mausner, Dmitri G. Medvedev *(BNL),* David Denton, John Cosgrove, Saed Mirzadeh *(ORNL),* Albert L. Hanson *(BNL),* invited

4:50 p.m.
Low Energy Proton Irradiation of $^{86}SRCL_2$ at BLIP to Produce Radioisotope Y-86, Dmitri G. Medvedev, Leonard F. Mausner *(BNL),* invited

5:10 p.m.
Deuteron Beams to Produce Radionuclides for Theranostic Medicine Applications, M. L. Bonardi, S. Manenti, L. Gini, F. Groppi *(Università degli Studi di Milano & INFN)*

5:25 p.m.
The Theragnostic Radionuclide Pair: ^{64}Cu/ ^{67}Cu at Arronax Cyclotron., Nathalie Michel *(GIP Arronax/Univ of Nantes),* Gaia Pupillo *(Univ and IFN of Ferrara),* Thomas Sounalet *(GIP Arronax/Univ of Nantes),* Cyrille Alliot *(Univ of Nantes),* Mauro Gambaccini *(University and INFN of Ferrara),* Ferid Haddad *(GIP Arronax/Univ of Nantes)*

5:40 p.m.
Nucleophilic F-18 Fluorination for Bioconjugation Chemistry: Its Applications to Imaging Agents, Dae Yoon Chi *(Sogang Univ),* Byoung Se Lee *(FutureChem Co., Ltd.),* Hyejin Ahn, Byungsoo Kang *(Sogang Univ),* invited

APPLICATION OF NUCLEAR TECHNIQUES TO NATIONAL SECURITY AND TREATY MONITORING

Session Organizers: Kenan Ünlü *(Penn State),* Igor Jovanovich *(Penn State)*
Cochairs: Kenan Ünlü *(Penn State Univ),* Igor Jovanovich *(Penn State Univ)*

Toronto – 3:30 p.m.

3:30 p.m.
Cyclic Neutron Activation Analysis of Actinides for Material Characterization, Bruce D. Pierson, Marek Flaska, Sara A. Pozzi *(Univ of Michigan)*

3:45 p.m.
Material Characterization to Support a National Nuclear Forensics Library, Stephen LaMont, Marcia Brisson, Heather Dion, Ed Fei *(DOE),* Michael Kristo, Ian Hutcheon *(LLNL),* Lav Tandon, Robert Steiner *(LANL),* John Wacker, Andy Luksic *(PNNL)*

4:00 p.m.
Environmental Cesium Isotope Ratio Measurements: Nuclear Forensic Applications, Darin C. Snyder, Nick Mann, Mathew Snow *(INL)*

4:15 p.m.
Evaluating Polymer Ligand Film (PLF) for Plutonium and Uranium Extraction in Nuclear Forensics Applications, Jung H. Rim *(Penn State Univ/LANL),* Dominic Peterson, Claudine Armenta, Edward Gonzales *(LANL),* Kenan Ünlü *(Penn State Univ)*

4:30 p.m.
Hot Particle Analysis Using Nondestructive Autoradiography, Nuclear Counting and Microanalysis for Low-Level Activity, C. J. Zeissler, S. Turner, R. M. Lindstrom, J. Davis *(NIST)*

4:45 p.m.
Standoff Enrichment Measurements Using Filamentation Laser-Induced Breakdown Spectroscopy, Igor Jovanovic, Kyle Hartig, Phyllis Ko *(Penn State Univ),* invited

5:00 p.m.
Ultra-Sensitive Isotope Ratio Measurements Using Laser Photoionization of Sputtered Atoms, David Willingham, Benjamin Naes, Albert Fahey *(PNNL)*

5:15 p.m.
High Pressure Marinelli for Counting Low Activity Compressed Gas Samples, Troy Robinson, Nick R. Mann, Christopher P. Oertel, Matthew G. Watrous *(INL),* Christopher A. McGrath *(Idaho State Univ)*

5:30 p.m.
Development of a Field-Based Separator for the Rapid Identification of Uranium and Plutonium, Carol Mertz, Michael Kaminski *(ANL),* Carolina Fineman-Sotomayor *(LBNL)*

5:45 p.m.
Separation of Thorium from Uranium Using Commercial Extraction Chromatographic Resin, Lixiong Wang *(China Academy of Engineering Physics)*

6:00 p.m.
The Need for High-Purity Uranium-233, Alan Krichinsky, Doug Canaan, Jo Giaquinton, Cole Hexel *(ORNL)*

ISOTOPE DEVICES, ISOTOPE TRACERS AND OTHER APPLICATIONS

Session Organizer: Rolf Zeisler *(NIST)*
Cochairs: Justin Walenski *(Univ of Missouri, Columbia),* Jefferson Vianna Bandeira *(Brazilian Nuclear Energy Commission)*

Hong Kong – 3:30 p.m.

3:30 p.m.
Protective Effects of Active Compound from Ginger Against Radiation-Induced Cell Damage, Jin Kyu Kim, S. M. Nasir Uddin, Dong-Min Chung, Jin-Hong Kim *(KAERI)*

3:45 p.m.
Target Design and Qualification for Plutonium-238 Production, C. D. Bryan, R. M. Wham, R. W. Hobbs, C. J. Hurt, D. Chandler, J. D. Freels *(ORNL)*

4:00 p.m.
Preparative Scale Separation of Ethyl Esters of Diethylenetriaminepentaacetic Acid by Flash Chromatography, Jonathan Fitzsimmons *(BNL),* Michael Jay *(Univ of North Carolina)*

4:15 p.m.
Improvement of Betavoltaic Isotope Battery, Guanquan Wang, Hongyuan Wei, Yuqing Yang, Rui Hu, Yebing Liu, Shunzhong Luo *(China Academy of Engineering Physics)*

4:30 p.m.
Progress in Development of Low Energy Nuclear Reaction (LENR) Power Cells for Space Applications, George H. Miley, Kyu-Jung Kim, Tapan Patel, Bert Stunkard *(Univ of Illinois),* invited

4:50 p.m.
C Isotopes in Soil and Pollen in Lake Sediment, Southeastern Brazil: Atlantic—Amazon Forests Ancient Dynamics and Connections, L. C. R. Pessenda, A. A. Buso Jr., P. E. De Oliveira, P. C. Giannini *(USP),* M. C. L. Cohen *(UFPA),* F. L. Lorente, M. F. Correia *(USP),* invited

5:10 p.m.
Nutrients and Trace Elements in Six Sugarcane Varieties Measured by Instrumental Neutron Activation Analysis, M. I. V. Martinez, E. A. De Nadai Fernandes, M. A. Bacchi, G. A. Sarriés *(USP)*

QUALITY ASSURANCE TOPICS IN RADIOANALYTICAL AND RADIOPHARMACEUTICAL CHEMISTRY PAPERS/ PANEL

Session Organizers: Simon Mark Jerome *(National Physical Lab),* Sally Schwarz *(Washington Univ)*
Cochairs: Simon Jerome *(NPL),* Sally Schwarz *(Washington Univ School of Medicine)*

Crystal C – 5:00 p.m.

PAPERS:

5:00 p.m.
Use of IAEA Reference Materials for QA in Analytical Techniques and Applications to Environmental Sample Analysis, A. Ceccatelli, A. Fajgelj, M. Groening, S. Tarjan, A. R. Iurian, A. Pitois *(IAEA),* invited

5:15 p.m
Quality Control of the Radiopharmaceutical Precursors ItraPol ($^{90}YC1_3$) and LutaPol ($^{177}LuC1_3$) Produced at POLATOM, Piotr Garnusek, Alina Markiewicz, Dariusz Pawlak, Anna Filiks, Iwona Sasinowska, Tomasz Dziel, Michal Korytkowski, Renata Mikolajczak *(POLATOM)*

5:30 p.m
Quality Control of Reactor Produced Radioisotopes at MURR, Cathy S. Cutler, Leonard Manson, Jack Lydon, Mike Flagg *(Univ of Missouri, Columbia),* invited

5:45 p.m
Research vs cGMP Manufacture—Challenges and Opportunities, Suzanne V. Smith, Jean Odin McCabe *(BNL),* invited

PANEL DISCUSSION

The Panel will discuss Quality Assurance methods used for medical radionuclide (Mo-99, Sr-89) and precursor (Y-90 and Lu-177) production used in radiopharmaceutical production and how this is achieved in various settings. Panel members will discuss GMP process including Pharmacopeia specifications, and other national standards and how these analyses are performed. Additionally we will discuss reference standards and terminology updates which are used in nuclear chemistry, radioanalytic and radiopharmaceutical chemistry. The panel members represent a diverse work setting, including research reactors, Standards laboratories, national laboratory and a university cyclotron facility.

PANELISTS:

- Simone Jerome *(National Physical Lab)*
- Sally Schwarz *(Washington Univ)*
- Cathy Sue Cutler *(Univ of Missouri, Columbia)*
- Suzanne V. Smith *(BNL)*
- Alessia Ceccatelli *(IAEA)*
- Renata Mikolajczak *(POLATOM)*
- Mauro L. Bonardi *(Univ/Milano)*
- Evgeny G. Romanov *(JSC "SSC RIAR")*

MARIE CURIE COMMEMORATIVE SESSION–PANELISTS/ PAPERS

Session Organizer: Paul T. Dickman *(ANL),* Rolf Zeisler *(NIST),* Stephen P. LaMont *(LANL)*
Cochairs: Paul Dickman *(ANL),* Mary Anne Yates *(Argonne National Laboratory)*

Crystal B – 8:00 a.m.

PANELISTS:

- Janice Dunn-Lee, Deputy Director General *(IAEA)*
  The Next Marie Curie: The Role of the IAEA in Advancing Women in Nuclear Science
- Darleane Christian Hoffman, Professor Emerita *(Univ of California-Berkeley)*
  Some Reflections on my 70 Year Career in Chemistry and the Changing Status of Women
- Valerie G. Segovia, Director of Outreach and Development, Nuclear Power Institute *(Texas A&M Univ)*
  POWER SET: Empowering Young Women to Assume Their Role in Nuclear Science

PAPERS:

9:00 a.m.
Radium: From Discovery by Marie Curie to Medical Applications, Jean-Louis Alberini *(Curie Inst),* invited

9:25 a.m.
The Role of Periodic Tables in the Discovery of New Chemical Elements, Darleane C. Hoffman *(Univ of California/Berkeley/LBNL),* invited

REFRESHMENT BREAK IN EXPO

Regency Ballroom – 9:50 a.m.-10:10 a.m.

MARIE CURIE PLENARY SESSION

Session Organizers: Paul T. Dickman *(ANL),* Rolf Zeisler *(NIST),* Stephen P. LaMont *(LANL)*
Cochairs: Janice Dunn-Lee *(IAEA),* Sue Clark *(Washington State Univ, Pullman)*

Crystal B – 10:10 a.m.

10:10 a.m.
Applications of Positron Annihilation Techniques, Ilham Y. Al-Qaradawi, D. A. Abdulmalik *(Qatar Univ),* invited

10:35 a.m.
Rapid Radiotracer Chemistry and Imaging the Human Brain, Joanna S. Fowler *(BNL),* invited

11:00 a.m.
Cyclotron Production and Imaging Applications of Positron Emitting Radiometals, Suzanne E. Lapi *(Washington Univ),* invited

11:25 a.m.
Current Directions in Diagnostic and Therapeutic Radiopharmaceuticals, Silvia S. Jurisson *(Univ of Missouri, Columbia),* invited

11:50 a.m.
Biogeochemical Processes Controlling the Transport of Plutonium in the Environment, Annie B. Kersting *(LLNL),* invited

SPECIAL PANEL DISCUSSION ON U.S. AND INTERNATIONAL ISOTOPE POLICY ISSUES

Toronto – 1:00 p.m. - 2:30

Join ANS Washington Representative Craig Piercy in a policy panel discussion on the role of isotope production activities that are being conducted in an increasingly complex and global marketplace, influenced by varying levels of governmental promotion and involvement. This panel will explore the current state of national and multinational policies related to isotope production and explore future trends.

POSTER DISCUSSION A AND REFRESHMENT BREAK

Regency Ballroom – 1:00 p.m.-3:00 p.m.

ISOTOPE PRODUCTION IN REACTORS

A1 Capabilities of the LVR-15 Research Reactor for Production of Medical and Industrial Radioisotopes, Michal Koleška, Jaroslav Ernest, Zdena Lahodova, Ladislav Viererbl, Miroslav Vins, Jaroslav Šoltes, Josef Stehno *(Centrum vyzkumu Řež)*

A2 Development of the Automated Control System Supporting Production of Radionuclides for Medical Applications, S. G. Novikov, A.V. Berintsev, A. E. Kondratyev, D. V. Kozlov, A. B. Muralev *(Ulyanovsk State Univ),* R. A. Kuznetsov , V. A. Tarasov *(JSC "SSC RIAR"),* V. V. Svetukhin, A. V. Zhukov *(Ulyanovsk State Univ)*

A3 Production of Iodine-131 by Irradiating Tellurium Dioxide at JSC "SSC RIAR", L. L. Kazakov, R. A. Kuznetsov, A. V. Kupriyanov, E. G. Romanov, V. A. Tarasov, D. G. Rybin, S. A. Sazontov, V. A. Uzikov *(JSC "SSC RIAR")*

A4 New Version of ORIP_XXI Software to Analyze the Data on Isotopes, E. G. Romanov, V. A. Tarasov *(JSC "SSC RIAR")*

A5 Development of Silver-Exchanged Adsorbents for the Removal of Fission Iodine from Alkaline Dissolution, Seung-Kon Lee, Suseung Lee, Ul Jae Park, Kwon Mo Yoo, Kang Hyuk Choi, Jun Sig Lee *(KAERI)*

A6 Development of Aluminum Waste Treatment Process for Applying to Fission Mo-99 Production, Suseung Lee, Seung-Kon Lee, Sung-Hee Jung, Soon-Bog Hong, Kyung-Duk Jang, Sang Mu Choi, Jun Sig Lee, In-Cheol Lim *(KAERI)*

A7 Development of the Adsorbent for Gaseous Iodine Treatment for Applying to Fission MO-99 Production, Suseung Lee, Seung-Kon Lee, Yong Bae Park, Ul Jae Park, Kwon Mo Yoo, Kang Hyuk Choi, Jun Sig Lee *(KAERI)*

A8 Studying of the Carrier-Free ^{177}Lu Radioisotope Production Methods in NRC "Kurchatov Institute", P. Boldirev, D. Chuvilin *(NRC "Kurchatov Inst"),* S. Deev, V. Golovachenko *(RAS),* D. Markovskiy, R. Nurtdinov, M. Proshin, A. Semenov, Y. Vereshagin, V. Zagryadskiy, A. Zaharov *(NRC "Kurchatov Inst"),* invited

A9 Development of High Specific Activity ^{99}Mo Radioisotope Production Method in Radiative Absorption Reaction ^{99}Mo(n,γ)^{99}Mo Using Structured Molybdenum-Containing Nanoparticles as Target Material, Dm. Chuvilin, Ya. M. Kravec, L. L. Menshikov, M. A. Proshin, A.N. Semenov, T. A. Udalova, Y. I. Vareshagin, A. V. Zagnitko, V. A. Zagryadskiy *(NRC "Kurchatov Inst"),* invited

A10 Development and Scaling of n-GAMMA Mo-99 Production at MURR, Leonard Manson, Jack Lydon, Ralph Butler, Mike Flagg *(Univ of Missouri, Columbia)*

A11 Development of an Alkaline Process for Recovery of Uranium from ^{99}Mo Production Process Waste Residue, Lize Stassen, Janine Suthiram *(Necsa)*

ISOTOPE PRODUCTION AND OUTPUT ANALYTIC CONTROL AND QUALITY SYSTEMS

A12 Overview of New Uranium Isotopic Reference Materials at IRMM, Stephan Richter, Sebastien Mialle, Jan Truyens, Roger Eykens, Ulf Jacobsson, Yetunde Aregbe *(IRMM-JRC-EU)*

A13 Plutonium Age Dating for Nuclear Forensics: A Close-Up on the Pu/U Chronometers, M. Sturm *(Univ of Natural Resources and Life Sciences Vienna),* S. Richter, Y. Aregbe, R. Wellum, K. Mayer *(EC JRC),* T. Prohaska *(Univ of Natural Resources and Life Sciences Vienna)*

A14 IRMM-1000 and REIMEP-22: A Certified Reference Material and an Interlaboratory Comparison on U/TH Age Dating for Nuclear Forensics, Celia Venchiarutti, Stephan Richter *(EC-JRC),* Zsolt Varga *(ITU),* Rozle Jakopic *(EC-JRC),* Klaus Mayer *(ITU),* Yetunde Aregbe *(EC-JRC)*

A15 Excitation Function Measurements for TC^{99m} Production by Proton Beams Irradiation—The Italian Contribution, S. Manenti, L. Gini, Flavia Groppi *(Università degli Studi di Milano & INFN)*

A16 Terminology on the Concepts of Carrier, Specific Activity, Activity Concentration and Purities in Nuclear and Radiochemistry, Radioanalytical and Radiopharmaceutical Chemistry, M. L. Bonardi *(Università degli Studi di Milano)*

ACCELERATOR PRODUCED ISOTOPES

A17 Computational Fluid Dynamics Simulation of Uranium Aqueous Solution for Mo-99 Production, Jason Oakley, Geoffrey Bull, Michael Corradini *(Univ of Wisconsin, Madison),* Eric Van Abel *(Shine Medical Technologies)*

A18 Radiation Safety in PET Isotope Work: A Resource not a Restriction, Kinda Abdin, Daniel Szatkowski *(Washington Univ),* Susan M. Langhorst *(Washington Univ/Mallinckrodt Inst of Radiology)*

A19 Accelerator-Based Production of ^{99}Mo: A Comparison Between the ^{100}Mo(p,x) and ^{96}ZR(α,n) Reactions, Gaia Pupillo (*Dipartimento di Fisica e Scienze della Terra and INFN of Ferrara),* Juan Esposito *(INFN),* Ferid Haddad, Natalie Michel *(GIP Arronax),* Mauro Gambaccini *(Dipartimento di Fisica e Scienze della Terra and INFN of Ferrara)*

A20 Radiation Safety in PET Isotope Work: Resource Tools, Kinda Abdin, Daniel Szatkowski *(Washington Univ),* Susan M. Langhorst *(Washington Univ/Mallinckrodt Inst of Radiology)*

A21 Effect of Bubble Agitation on Heat Transfer from a Volumetrically Heated Liquid Pool, Geoffrey Bull, Jason Oakley, Michael Corradini *(Univ of Wisconsin, Madison),* Eric van Abel *(Shine Medical Technologies)*

A22 Determination of the Specific Activity and Isotope Ratios of Strontium in Production Scale Strontium-82 by Gamma Spectroscopy and ICP-OES/MS, Jonathan M. Fitzsimmons, Leonard F. Mausner *(BNL)*

A23 ^{65}Zn Purification from Irradiated Gallium Metal, Jonathan Fitzsimmons, Slawko Kurczak, Leonard Mausner *(BNL)*

A24 Targetry for Production of ^{44}Ti/^{44}Sc Generator Systems at the Los Alamos Isotope Production Facility, V. Radchenko, M. E. Fassbender, F. M. Nortier, J. W. Engle, Justin J. Wilson, W. A. Taylor, E. R. Birnbaum, K. D. John *(LANL)*

A25 Production of ^{129,130,131,132,136}Cs by Proton Irradiation of ^{nat}XeTargets for use in Radiochemical Separation Experiments of Surrogate UREX Waste, Paul A. Ellison, Todd E. Barnhart, Robert J. Nickles *(Univ of Wisconsin, Madison),* Jeff Driscoll *(Shine Medical Technologies, Inc.),* Onofre T. DeJesus *(Univ of Wisconsin, Madison)*

A26 Determination of the Specific Activity and Isotope Ratios of Germanium in Production Scale Germanium-68 by Gamma Spectroscopy and ICP-MS, Jonathan M. Fitzsimmons, Leonard F. Mausner *(BNL)*

A27 Method of Photonuclear Production of ^{99m}Tc,^{67}Cu, ^{195m}Pt, N. Dikiy *(Kharkov Inst of Physics and Technology),* E. Bodnar *(Trauma Risk Management Research Inst),* E. Medvedeva *(Kharkov Inst of Physics and Technology)*

A28 Alternative Method for Separation of Technetium-^{99}m from Dissolved Mo Target, Dariusz Pawlak, Jozef L. Parus, Wioletta Wojdowska, Renata Mikolajczak *(POLATOM)*

A29 Study on the Development of Safe Decommissioning Procedures for Medical Isotope Production Cyclotron in Rep of Korea, Yongmin Kim, Rina Woo, Dayoung Kwon *(Catholic Univ of Daegu),* Minchul Song, Woonkap Cho *(KINS)*

PRODUCTION OF STABLE ISOTOPES

A30 Carbon Isotope Separation by Ion Exchange Chromatography in Cascate System, Carlos R. Sant Ana Filho, Alexssandra L. M. R. Rossete, João J. M. Milagres, Clelber V. Prestes, Eduardo Ferriolli, José A. Bendassolli (*Univ of São Paulo)*

ISOTOPE DEVICES, ISOTOPE TRACERS, AND OTHER APPLICATIONS

A31 Development of Radiation Monitoring System for 30-MeV Cyclotron, Jin-Woo Lee, Yun-Jong Lee, Min-Goo Hur *(KAERI),* Che-Hwan Im *(REMTECH)*

A32 Experimental Studies of ^{64}Cu and ^{67}Cu Medical Isotopes Production Using Spallation Neutrons Generated in Massive Uranium Target, Yu. Petrusenko, V. Sotnykov, V. Voronko *(Kharkov Inst of Physics and Technology),* I. Bodnar *(ANL),* A. Baldin, S Tyutyunnikov *(Joint Inst for Nuclear Research)*

A33 Software for Simulation of Radiation Fields in 3-D Distributed Multisource Models «RADVIS», M. Yu. Tikhonchev, A. B. Muralev, D. V. Kozlov, A. V. Zhukov, V. V. Svetukhin *(Ulyanovsk State Univ),* R. A. Kuznetsov, V. A. Tarasov *(JSC "SSC RIAR")*

A34 Fiber Optic Radiation Dosimetry System Based on Scintillating Fibers, S. G. Novikov, A. V. Berintsev, A.A. Chertoriysky, A. B. Muralev *(Ulyanovsk State Univ),* R. A. Kuznetsov *(JSC "SSC RIAR"),* V. V. Svetukhin, A. V. Zhukov, I. O. Zolotovsky, D. V. Kozlov *(Ulyanovsk State Univ)*

A35 Transmutation of Technetium and Production of Artificial Stable Ruthenium, K. V. Rotmanov, V. A. Tarasov, E. G. Romanov *(JSC "SSC RIAR"),* A. A. Kozar, V. F. Peretrukhin *(A. N. Frumkin Inst of Physical Chemistry and Electrochemistry)*

A36 A Novel Design of Human Resource Education Curriculum for Professional Manpower in RI-Biomics Field, Woo-Ho Shin, Yu-Sun Yeom, Young-Muk Hwang, Tai-jin Park *(Korea Radioisotope Association),* Sang-Hyun Park *(KAERI)*

A37 Current Trends of ^{14}C and ^{3}H in the Field of RI-Biomics, Sol-Ah Jang, Yu-Sun Yeom, Tai-Jin Park *(Korea Radioisotope Association)*

A38 Evaluation of Cholesterol Absorption Inhibition of Anti NPC1L1 IgY by ^{3}H-Labeled Cholesterol in Sprague-Dawley Rats, Sang Hyun Park, Hayu Tyas Utami *(KAERI/Univ of Science and Technology),* Jaeyoung Cho *(JYJ Consulting),* Beon-Su Jang *(KAERI/Univ of Science and Technology)*

A39 Comparison Between Peak-to-Peak and Peak-to-Valley Methods for Positron Emission Tomography, M. A. Alkhorayef *(King Saud Univ/Univ of Surrey),* Nicholas M. Spyrou *(Univ of Surrey)*

A40 Evaluating Follar Uptake of Ammonia by Corn Using the Stable Isotope ^{15}N, Evandro Luiz *(USP),* Hugo Gonzalez Villalba *(Luiz de Queiroz College of Agriculture),* Paulo Cesar Ocheuze Trivelin *(USP)*

ISOTOPE TRACERS

A41 Effect of Vinasse Application in the ^{13}C and ^{15}N in the Soils Cultivated with Sugarcane in South Brazil, Alexssandra L. M. R. Rossete, Carlos R. Santana Filho, Gabriela G. Medeiros, Jose A. Bendassolli, Marcelo Z. Moreira, Plinio B. Camargo *(USP)*

A42 ^{99m}Tc-Labeled Gold-Binding Peptide for Molecular Imaging, Beom-Su Jang, Jong Kook Rho, Joo-Sang Lee, Sang Hyun Park *(KAERI)*

A43 Different Formulations of TBP- TOA/Cyclohexane and Experimental Conditions to Extract the $^{99m}TCO_4$, Eluted from a ^{99}MO/^{99M} Tc Generator, Judith Dominguez Catasius, Martha Sahyli Ortega Pijeira, Ernesto Martinez Báez, Jorge L. Batista Roche, Jorge Isaias Borroto Portela *(INSTEC)*

ACCELERATOR-BASED PRODUCTION OF Mo-99

Session Organizers: Thomas Ruth *(TRIUMF),* George F. Vandergrift III *(ANL)*
Cochairs: Thomas Ruth *(TRIUMF),* Henri Bonet *(IRE, retired)*

Toronto – 3:00 p.m.

3:00 p.m.
Update on the University of Alberta's TR24 Production of ^{99m}TC, K. Gagnon, J. Andersson, B. Thomas, J. Wilson, J. Doupe, S. A. McQuarrie, A. J. B. McEwan *(Univ of Alberta),* invited

3:20 p.m.
Current is King: The Direct Production of ^{99}MTC Via the ^{100}MO(P,2N) Channel on Small Medical Cyclotrons, K. Buckley *(TRIUMF),* T. J. Ruth *(TRIUMF/BC Cancer Agency),* F. Bénard *(BC Cancer Agency),* M. Kovacs *(Lawson Health Research Inst),* A. Celler *(Univ of British Columbia),* V. Hanemaayer, B. Hook, S. McDiarmid, S. Zeisler *(TRIUMF),* J. Corsaut *(Lawson Health Research Ins),* C. Economou *(Centre for Probe Development and Commercialization),* J. Klug *(BC Cancer Agency),* R. Harper *(Centre for Probe Development and Commercialization),* M. Vuckovic *(BC Cancer Agency),* J. Valliant *(Centre for Probe Development and Commercialization),* P. Schaffer *(TRIUMF),* invited

3:35 p.m.
Target Materials for Accelerator Production of TC-99M, Vernal Richards, Efrem Mebrahtu, Tara Mastren, Suzanne E. Lapi *(Washington Univ),* invited

3:55 p.m.
Safety Regulation of Medical Isotope Production Accelerators in Canada, Kavita Murthy *(Canadian Nucl Safety Comm)*

4:15 p.m.
Supplying Alternative Mo-99/Tc-99m Production: Availability of Mo-100/Mo-98, P. E. Hardy *(ISOFLEX USA),* G. M. Skorynin, S. V. Filimonov, A. N. Gilev, G. V. Kolygaeva *(JSC),* invited

4:35 p.m.
Accelerator Production of Mo-99 Utilizing Electron Accelerators, James T. Harvey *(NorthStar Medical Technologies, LLC),* invited

4:55 p.m.
Development of Photon-Based Accelerator Production as a Viable Route to Large-Scale Supply of Mo-99/TC-99m in Canada, Kennedy Mang'era *(Univ of Manitoba),* invited

5:10 p.m.
Recent Progress in the Design and Experimental Activities Supporting the Commercial Electron Accelerator Production of the Medical Radioisotope Mo-99, Gregory E. Dale *(LANL),* Sergey D. Chemerisov, George E. Vandegrift *(ANL),* Keith A. Woloshun, Charles T. Kelsey IV, Michael A. Holloway, Michael Mocko *(LANL),* Vakho Makarashvili, Peter Tkac, Charles D. Jonah *(ANL),* Eric R. Olivas, Angela C. Naranjo, Frank P. Romero, Dale A. Dalmas *(LANL),* James T. Harvey *(NorthStar Medical Technologies),* invited

5:30 p.m.
Radiation Protection Consideration during Construction, Commissioning and Production of Mo-99 with a 40 kW 35 MeV Electron Linac at the Canadian Light Source, Pradyot Chowdhury *(Canadian Light Source Inc.),* invited

APPLICATIONS IN NUCLEAR MEDICINE—DIAGNOSTICS

Session Organizers: Cathy Sue Cutler *(Univ of Missouri),* Buck Rogers *(Washington Univ)*
Cochairs: Buck Rogers *(Washington Univ, St. Louis),* Joanna Fowler *(BNL, retired)*

Acapulco – 3:00 p.m.

3:00 p.m.
Radiometal-Based Immunopet Imaging of Cancer, Hao Hong, Weibo Cai *(Univ of Wisconsin, Madison),* invited

3:20 p.m.
^{44m}Sc/^{44}Sc in Vivo Generator: First Experience of Vector Radiolabeling and Biological Evaluation for Radiopharmaceutical Development, S. Huclier-Markai *(Univ of Nantes/Arronax GIP).* C. Alliot *(Arronax GIP/CRCNA),* J. Rousseau, N. Chouin *(AMAROC/ONIRIS),* M. Mougin-Degraef *(CRCNA-Inserm),* M. Fani *(Univ Hospital of Basel),* P. Bouziotis, T. Maina *(NCSR Demokritos),* C. S. Cutter *(Univ of Missouri, Columbia),* J. Barbet *(Arronax GIP/CRCNA),* invited

3:40 p.m.
The Site-Specific Radiolabeling of Antibodies on the Heavy Chain Glycans, Brian M. Zeglis, Charles B. Davis *(Memorial Sloan-Kettering Cancer Center),* Robert Aggeler *(Life Technologies),* Pier Selenica *(Memorial Sloan-Kettering Cancer Center),* Hee Chol Kang, Aimei Chen, Brian J. Agnew *(Life Technologies),* Jason S. Lewis *(Memorial Sloan-Kettering Cancer Center),* invited

4:00 p.m.
Diagnostic Imaging with ^{68}Ga-Biophosphonates vs. Treatment of Bone Metastases with ^{177}Lu-Analogues, Marian Meckel *(Univ of Mainz),* Voitech Kubicek, Petr Herrman *(Charles Univ in Prague),* Ralf Bergmann, Jens Pietsch, Joerg Steinbach *(HZDR),* C. S. Bal *(AIIMS),* Richard Baum *(Theranostics),* Frank Roesch *(Univ of Mainz)* invited

4:20 p.m.
Development of Metrology Tools for Enhancing the Quantitative Value of Positron Emission Tomography, Brian E. Zimmerman, Denis E. Bergeron, Jeffrey T. Cessna, Ryan Fitzgerald, Matthew M. Mille, Leticia Pibida *(NIST),* invited

4:40 p.m.
New SPECT Tracers in the Era of PET: Nice to Have or Need to Have?, Roger Schibli *(Paul Scherrer Inst),* invited

5:00 p.m.
Imaging Lung Function Using Hyperpolarized ^{3}He, Stephen Kadlecek, Hooman Hamedani, Yi Xin, Rahim Rizi *(Univ of Pennsylvania),* invited

5:20 p.m.
Custom Labeling and Evaluation of Proteins with Zr-89, Jason A. Rogers, Druce K. Crump, Jaime Simón, Scot H. Ellebracht *(IsoTherapeutics Group LLC),* Christopher M. Bull, John L. Chunta *(Molecular Imaging, Inc.),* Lori Murray *(PerkinElmer, Inc.)*

RADIOPHARMACEUTICAL CHEMISTRY

Session Organizer: Meera Venkatesh *(IAEA)*
Cochairs: Meera Venkatesh *(IAEA),* Jim Simon *(IsoTherapeutics)*

Acapulco – 5:40 p.m.

5:40 p.m.
Which Will be the Workhorse Radionuclide of Future Diagnostic Nuclear Medicine?, Adriano Duatti *(Univ of Ferrara),* invited

6:00 p.m.
Validation of HCl-EtOH-Method for Preconcentration of ^{68}Ge/ ^{68}Ga Generator Eluate and Study of the Sorption-Desorption Mechanism, A. A. Larenkov, E. I. Lesik, T. A. Khaustova, A. B. Bruskin *(Burnasyan FMBC),* Ya. V. Zubavichus *(Kurchatov Inst),* G. E. Kodina *(Burnasyan FMBC),* invited

6:20 p.m.
Iodinated GRP-OPE Conjugate and in Vitro Properties, Zhijun Zhou, Hongyuan Wei, Guanquan Wang (*China Academy of Engineering Physics)*

REACTOR PRODUCTION OF MEDICAL ISOTOPES

Session Organizers: Natesan Ramamoorthy *(Homi Bhabia National Inst),* Cathy Cutler *(Univ of Missouri, Columbia)*
Cochairs: Cathy Cutler *(Univ of Missouri, Columbia),* Bernard Ponsard *(SCK-CEN - BR2 Reactor)*

Crystal A – 3:00 p.m.

3:00 p.m.
The Necessity of Research Reactors for Radioisotope Production, Bernard J. Ponsard *(SCK.CEN/ BR2 Reactor),* invited

3:20 p.m.
Novel Radionuclide Production at POLATOM, Renata Mikolajczak *(POLATOM),* invited

3:40 p.m.
Production of Radioisotopes at the Jules Horowitz Reactor, Jean-Pierre Coulon *(CEA),* invited

4:00 p.m.
Reactor Isotope Production at MURR, Cathy S. Cutler *(Univ of Missouri),* invited

4:20 p.m.
Production of High Specific Activity of ^{153}Sm by Isotope Separation Following Neutron Irradiation, John M. Dauria, Keith Frank *(Isotherapeutics Group, LLC),* Alan Ketring *(Missouri Univ Research Reactor),* Keith Ladouceur *(Advanced Applied Physics Solutions),* Suzanne E. Lapi *(Washington Univ),* Thomas J. Ruth *(TRIUMF),*Paul Schmor *(Schmor Particle Accelerator Consulting, Inc.),* Daniel W. Stracener *(ORNL),* Jaime Simon *(Isotherapeutics Group, LLC)*

4:35 p.m.
Experimental Validation for Optimization of Transcurium Isotope Production, Susan Hogle, Charles W. Alexander, Jonathan D. Burns, Julie G. Ezold *(ORNL)*

4:50p.m.
Radiochemical Isolation of the Therapeutic ^{195m}Pt from the Neutron Irradiated ^{193}Ir Metal, N. V. Aksenov, S. A. Karamyan, G. A. Bozhikov, A. Sh. Madumarov, L. S. Sokolova, A. G. Maslennikov, S. N. Dmitriev *(Joint Inst for Nuclear Research)*

5:05 p.m.
Production of Transplutonium Elements at JSC "SSC RIAR", Yu. G. Toporov, E. V. Shimbarev, V. A. Tarasov, E. G. Romanov, A. V. Kupriyanov *(JSC "SSC RIAR")*

5:20 p.m.
Calculation of the Specific Activity of ^{177}Lu, Otto Knoesen, Steven Maage *(NTP Radioisotopes SOC Ltd)*

5:35 p.m.
Research Reactor Production and Purification of ^{64}Cu and ^{67}Cu Using Enriched Zinc Isotopes, Amanda M. Johnsen, Brenden J. Heidrich, Chad B. Durrant, Andrew J. Bascom, Kenan Ünlü *(Penn State)*

5:50 p.m.
Sr-89 Production Using Reactors of JSC "SSC RIAR", E. G.Romanov, V. A.Tarasov, I. Yu. Zhemkov, R. A. Kuznetsov, P. S. Butkalyuk *(JSC "SSC RIAR")*

PRODUCTION OF STABLE ISOTOPES

Session Organizer: Wolfgang H. Runde *(LANL)*
Cochairs: Wolfgang Runde *(LANL),* Darren Brown *(Trace Sciences International Corp)*

Hong Kong – 3:00 p.m.

3:00 p.m.
Isotope Production at Oak Ridge National Laboratory, John W. Krueger *(ORNL),* invited

3:20 p.m.
Production Capacities of ROSATOM State Corporation's Isotope Complex in the Sphere of Stable Isotopes' Manufacturing and Supplies, Aleksey Vakulenko *(JSC Isotope)*

3:35 p.m.
Development of Electromagnetic and Gas Centrifuge Technologies for the Enrichment of Stable Isotopes, Brian J. Egle, Kevin J. Hart, William D. Strunk, Gary E. Giles *(ORNL),*invited

3:50 p.m.
Demonstration of Magnetically-Activated and Guided Isotope Separation (MAGIS), Mark G. Raizen *(Univ of Texas, Austin)*

4:05 p.m.
Multicomponent Separation Potential: Back to the DIRAC, O. E. Aleksandrov, V. M. Gadelshin, V. A. Palkin, V. D. Seleznev *(Ural Federal Univ)*

STABLE ISOTOPES IN MATERIALS AND ENVIRONMENTAL RESEARCH

Session Organizer: Robert Gregory Downing *(NIST)*
Cochairs: Tor Bjørnstad *(Institute for Energy Technology),* Raymond Cao *(Ohio State Univ)*

Hong Kong – 4:20 p.m.

4:20 p.m.
A Time-Dependent Picture of Hydration Layer Evolution During Glass Corrosion via Isotopic Tracing Mechanisms, J. V. Ryan, D. A. Schreiber, Z. Zhu, J. J. Neeway, A. V. Mitroshkov *(PNNL)*

4:35 p.m.
Iodine Valence and Local Environment in Nuclear Waste Glass Characterized by X-Ray Absorption Spectroscopy, David A. McKeown, Isabelle S. Muller, Ian L. Pegg *(Catholic Univ of America)*

4:50 p.m.
Local Time-Averaged Gas Holdup in Fluidized Bed Reactor Using Gamma Ray Computed Tomography Technique (CT), Abdelsalam Efhaima, Muthanna H. Al-Dahhan *(Missouri Univ of Science and Technology)*

5:05 p.m.
Identifying and Analyzing Species of Pollens in Taiwan by Isotope Ratio Mass Spectrometer, Wen-Chi Wang, Chien-Cheng Jung, Chuan-Pin Lee, Ming-Chee Wu, Huey-Jen Su *(Cheng Kung Univ)*

NUCLEAR DATA FOR MEDICAL ISOTOPES

Session Organizers: Syed M. Qaim *(FzJ),* Philip L. Cole *(Idaho State Univ)*
Cochairs: Syed Qaim *(Research Centre Jülich),* Elena Bodnar *(ANL)*

Crystal C – 3:00 p.m.

3:00 p.m.
Predicting Medical Isotope Production with TALYS: The Case of ^{99m}TC, A. J. Koning *(NRG),* invited

3:20 p.m.
New Developments in the Experimental Data for Charged Particle Production of Medical Radioisotopes, Ferenc Ditrói, Ferenc Tárkányi, Sándor Takács *(Hungarian Academy of Sciences),* Alex Hermanne *(Vrije Universiteit Brussel),* invited

3:40 p.m.
Paucity of Photonuclear Data for the Accelerator-Based Production of Isotopes, Valeriia N. Starovoitova, Terry L. Grimm *(Niowave Inc.),* Philip L. Cole *(Idaho State Univ),* invited

4:00 p.m.
New Measurements for Proton and Deuteron Beam Monitor Reactions, Arnaud Guertin, Charlotte Duchemin *(SUBATECH/CNRS/IN2P3),* Eric Garrido *(SUBATECH/CNRS/IN2P3/INSERM UMR),* Ferid Haddad *(SUBATECH/CNRS/IN2P3/GIP Arronax),* Vincent Métivier (*SUBATECH/CNRS/IN2P3),* Nathalie Michel *(SUBATECH/CNRS/IN2P3/GIP Arronax)*

4:15 p.m.
Excitation Function Measurements for PD-103 Production by Deuteron Beams Irradiation, S. Manenti, M. L. Bonardi, L. Gini, F. Groppi *(Università degli Studi di Milano & INFN)*

ENVIRONMENTAL FATE AND IDENTIFICATION OF RADIONUCLIDES

Session Organizers: Timothy E. Payne *(ANSTO),* Stacey L. Lance *(Univ of Georgia)*
Cochairs: Timothy Payne *(ANSTO),* Stacey Lance *(Univ of Georgia)*

Crystal C – 4:35 p.m.

4:35 p.m.
Ultra-Sensitive Nuclear Measurements of Environmental Radioisotopes, Craig E. Aalseth, Jill M. Brandenberger, Matthew Douglas, James E. Fast, Gary A. Gill, James J. Moran, Robert C. Runkle *(PNNL),* invited

4:55 p.m.
Assessment of Naturally Occurring Radioactive Materials (NORM) In Mission, Texas Surface Soils, Mohammad Hannan, Nam Nguyen, Kareem Wahid *(Univ of Texas–Pan American)*

5:15 p.m.
Technetium Behavior in Nuclear Waste Vitrification Processes, Ian L. Pegg *(The Catholic Univ of America),* invited

5:35 p.m.
Using Chemical and Isotopic "Signatures" to Resolve Multiple Contamination Sources in the Environment, Sue B. Clark *(Washington State Univ),* invited

ISOTOPE RESEARCH PLENARY

Session Organizers: Paul T. Dickman *(ANL),* Rolf Zeisler *(NIST),* Stephen P. LaMont *(LANL)*
Cochairs: Heinz Gaeggeler *(Paul Scherrer Inst.),* Thomas F. Wall *(LBL)*

Crystal Ballroom – 8:00 a.m.

8:00 a.m.
Nuclear Data for Medical Radionuclides, Syed M. Qaim *(FzJ),* invited

8:25 a.m.
Targeted Alpha Therapy with ^{225}Ac and ^{213}Bi, Frederik Giesel *(University Heidelberg),* Alfred Morgenstern, Frank Bruchertseifer, Christos Apostolidis *(EC JRC),* invited

8:50 a.m.
Radiometric Fluxomics: A New Era for Quantitative Plant Biology, Richard A. Ferrieri *(BNL),* invited

9:15 a.m.
For the Sake of Security: Incentivizing Alternatives to High-Risk Radiological Sources, Miles A Pomper *(James Martin Center for Nonproliferation Studies),* invited

REFRESHMENT BREAK IN EXPO

Regency Ballroom – 9:45 a.m. - 10:10 a.m.

WCI PRESIDENT'S FORUM

"The Public Health Dilemma: Balancing Isotope Supply and Safety and Security"
Session Organizer: Paul T. Dickman *(ANL)*
Cochairs: Myung-Chul Lee Kim *(Seoul National Univ),* Wessel Van Zyl de Villers *(IAEA)*

Crystal B – 10:10 a.m.

Join WCI President Myung-Chul Lee and incoming WCI President Vanzyl de Villiers for special forum on policies that may affect future supplies of isotopes. The modern world needs isotopes for public health and prosperity, however increasing concerns about safety and non-proliferation are changing how the market meets these needs. This forum is an extraordinary opportunity for 8ICI attendees to hear from top governmental officials and senior policy makers on emerging issues and their concerns and thoughts about the future. This plenary will include presentations and a panel discussion.

PANELISTS:

- Allison Macfarlane, Chairman *(Nuclear Regulatory Commission)*
- Ramzi Jammal, Executive Vice-President and Chief Regulatory Officer *(Canadian Nuclear Safety Commission)*
- Chris Whipple *(ENVIRON)* Principal, Chair NAS Committee on Medical Isotope Production without HEU
- Michael J. Guastella, Executive Director *(Council on Radionuclides and Radiopharmaceuticals, Inc)*

POSTER PRESENTATION B AND REFRESHMENT BREAK

Regency Ballroom – 1:00 p.m.-3:00 p.m.

RADIOECOLOGY, RADIOACTIVE WASTE, AND ENVIRONMENTAL METHODS

B1 The Design of a Remote Radiation Monitoring System in Water Based on a Silicon Photomultiplier, H. M. Park, K. S. Joo, M. K. Park, S. H. Baeck *(Myongji Univ)*

B2 The Standardization of ^{241}Pu Samples by 2πα-Counting and Precision Gamma-Spectrometry Methods, I. Alekseev, T. Kuzmina *(V.G. Khlopin Radium Inst)*

B3 Samarium Determination by Neutron Activation Analysis in Uranium-Rich Samples, I. S. Ribeiro, Jr., M. Saiki, F. A. Genezini, G. S. Zahn *(Instituto de Pesquisa Energéticos e Nucleares)*

B4 Analyzing Emission Spectra Induced by a Transmission-Type X-Ray Tube with Respect to Target Thickness and Material Using Monte Carlo Simulation., H. S. Hong, S. H. Park, D. S. Kim, K. S. Joo *(MyongjiUniv),* J. S. Youn, S. H. Lee, S. W. Jeon *(SEC Co., Ltd)*

B5 Investigation of Polonium (IV) Complexation Properties, A. Younes *(Subatech),* D. Deniaud, S. Gouin *(CEISAM),* G. Montavon *(Subatech),* C. Alliot *(Arronax/INSERM),* M. Mokili *(Arronax/Subatech)*, N. Galland, E. Renault *(CEISAM),* R. Maurice, J. Champion *(Subatech)*

B6 Radioisotope Content of Coal and Coal Ash of Power Stations in Mongolian Capital City and its Distribution in Environment, Nanzad Norov *(Univ of Mongolia),* Tseren Davaadorj, Nyamjav Enkhtsogt, Namsraijav Altangerel *(Radiation Safety and Nuclear Technology Association of Mongolia)*

B7 Radionuclide Bioaccumulation in Trees at an Australian Legacy Low-Level Waste Site: Concentration Patterns in Branches and Foliage, K. L. Wilsher *(ANSTO/Charles Sturt Univ),* M .P Johansen, J. J Harrison, T. E Payne *(ANSTO),* J. A Howitt *(Charles Sturt Univ),* G. Doran, D. P. Child *(Charles Stuart Univ),* M. A. C. Hotchkis, S. Thiruvoth, L. Mokhber-Shahin, J. R Twining, C. R Vardanega, H. K. Y Wong *(ANSTO)*

B8 Beam Hardening Artifact: Cause and Correction Techniques, Zhihong Wu, Peng Cong, Ximing Liu *(Tsinghua Univ)*

B9 A Novel Radionuclide Specific Detector System for the Measurement of Radioactivity at Steel Works, E. Garcia-Toraño, V. Peyres, B. Caro, M. Roteta, *(CIEMAT),* D. Arnold, O. Burda *(PTB),* M-R Ioan *(IFIN-HH)*

B10 Control of Radionuclide Contamination by Using Aquatic Macrophytes, N. Dikiy, A. Dovbnya, Yu. Lyashko, E. Medvedeva *(KIPT)*

B11 Structural and Transport Characteristics of UC l_3 and $CeCl_3$Molten LiCl-KCl Mixture: A Molecular Dynamics Simulation Study, Tao Jiang, Ning Wang, Shuming Peng *(China Academy of Engineering Physics),* Liuming Yan *(Shanghai Univ)*

NUCLEAR FORENSICS

B12 Abatement of Xenon and Iodine Emissions from Medical Isotope Production Facilities, Charles G. Doll, Christina M. Sorensen, Theodore W. Bowyer, Judah I. Friese, James C. Hayes *(PNNL),* Emmy Hoffmann *(ANSTO),* Rosara Kephart *(Air Force Technical Applications Center)*

B13 Production of ^{236}Np and ^{236}Pu for Isotope Dilution Mass Spectrometry, M. E. Fassbender, L. A. Seaman, J. W. Engle, V. Radchenko *(LANL),* E. R. Balkin *(Univ of Washington),* F. M. Nortier, G. S. Goff, K. D. John *(LANL),* D. S. Wilbur *(Univ of Washington),* E. R. Birnbaum *(LANL)*

B14 International Sealed Source Database: A Radiological Forensics Signature Library, Jodi Canaday, David Chamberlain (*ANL),* Martha Finck *(INL),* Yu Tang, Seema Naik *(ANL),* Kevin Carney *(INL*)

B15 Cosmic-Ray Induced Production of Radioactive Noble Gases in the Atmosphere, Ground, and Seawater, William H. Wilson, Steven R. Biegalski, Christine Johnson (*Univ of Texas, Austin),* Derek Haas, Justin Lowrey *(PNNL)*

B16 14 MEV Neutron Irradiation Facility with an Automated Fast Cyclic Pneumatic System, Matthew T. Montgomery, Michael D. Yoho, Steven R. Biegalski, Sheldon Landsberger *(Univ of Texas, Austin)*

B17 UTEX Simulation of Tracer Gas Experiment, Justin D. Lowrey, Khris B. Olsen, Derek A. Haas, Amanda M. Prinke, Michael P. Foxe *(PNNL)*

RESEARCH

B18 Preparation of Purified ^{85}Sr Using No-Carrier-Added Technique, S. Yano, Y. Wakitani, T. Yamada *(Japan Radioisotope Association),* J. Kanaya, S. Shibata, K. Takahashi, H. Haba *(RIKEN)*

B19 Direction Tracking of Environmental Radiation Monitoring System, J. H. Park *(MyongJi Univ/Realgain Inc.)*, H. M. Park, K. S. Joo *(MyongJi Univ)*

B20 Target Material for Synthesis of Element 117, M. A. Ryabinin, E. A. Yerin, R. A. Kuznetsov *(JSC "SSC RIAR")*

B21 Synthesis, Crystal Structure and Spectroscopic Properties of $[TcO_2(Im)_4]Br{\cdot}2H_2O$, A. Ya. Maruk, M. S. Grigoriev, A. M. Fedoseev *(RAS),* K. Czerwinski, F. Poineau *(UNLV),* K. E. German *(RAS/Moscow Medical Inst),* invited

B22 Development of High-Density Targets for Mo-99 with Using Atomized U Metal Powder, Yong Jin Jeong, Jong Man Park, Kyu Hong Lee, Ki Nam Kim, Sung Hwan Kim *(KAERI)*

MEDICINE

B23 A Study on the Synthesis of ^{45}Sc-HBED-CC, Pyeong-Seok Choi *(Dongguk Univ),* Jung-Hoon Park *(KAERI),* Sang Wook Kim *(Dongguk Univ)*

B24 Comparison of Fungal Cell Susceptibility to External Alpha Particle Beam Radiation Versus Alpha Particles Delivered by 213-Bismuth-Labeled Antibody, Ruth Bryan *(Albert Einstein Coll of Medicine),* Igor Shuryak *(Columbia Univ),* Alfred Morgenstern, Frank Bruchertseifer (*EC JRC),* Stephen Marino *(Columbia Univ),* Ekaterina Dadachova *(Albert Einstein Coll of Medicine/EC JRC)*

B25 Synthesis and Evaluation of Surface Modified Folate Immobilized Silic-^{198}Au Nanocomposites, Jeong Hoon Park *(KAERI),* Jun Young Lee *(KAERI/Dongguk Univ),* Min Goo Hur, Seung Dae Yang *(KAERI),* Kook Hyun Yu, Sang Wook Kim *(Dongguk Univ)*

B26 Radiosynthesis and Comparison of ^{68}Ga-DOTA/NOTA Benzamides for Melanoma Imaging, Jeong Hoon Park *(KAERI),* Hee Jung Kim *(Radiopharmaceutical Lab),* Dong Yeon Kim *(Chonnam National Univ),* Min Goo Hur, Seung Dae Yang *(KAERI),* Kook Hyun Yu *(Dongguk Univ)*

B27 Synthesis of Novel Radiopharmaceuticals Using Gallium-68 Labeled Fe_3O_4 Nanoparticles, Bo Bae Cho *(Dongguk Univ),* Joon-Young Lee, Jung-Hoon Park, Min-Goo Hur *(KAERI),* Kook Hyun Yu *(Dongguk Univ)*

B28 Synthesis of [^{123}I] Iodoanthraquinones as a Radiotracer of Breast Cancer, Jeong Hoon Park *(KAERI),* Jun Young Lee *(KAERI/Dongguk Univ),* Min Goo Hur, Seung Dae Yang *(KAERI),* Sang Wook Kim, Kook Hyun Yu *(Dongguk Univ)*

B29 Development of a Prelabeling Approach for a Targeted Nanochelator, Jonathan Fitzsimmons, Robert Atcher *(LANL),* Cathy Cutler *(Univ of Missouri)*

B30 Radiometric Enzyme Assays: Tools for Studies of Biotransformations of Thyroid Hormones, S. Pavelka *(Acad. Sci. Czech Rep.)*

B31 Use of Radioanalytical Methods for Following the Development of Diet-Induced Obesity in the Mouse, S. Pavelka, J. Kopecky *(Acad. Sci. Czech Rep)*

B32 KIT Formulation and Adaptation of PET- Procedure for Fast and Effective Visualization of Inflammation Sites with ^{68}Ga-Citrate, A. A. Larenkov, E. I. Lesik, T. A. Khaustova, M. V. Zhukova, A. C. Lunev, A. B. Bruskin , O. E. Klementieva, G. E. Kodina *(Burnasyan FMBC),* invited

B33 Prospects for Production of Alpha Emitters for Medical Use at JSC "SSC RIAR", R. A. Kuznetsov, P. S. Butkalyuk, I. L. Butkalyuk, V. A. Tarasov, E. G. Romanov *(JSC "SSC RIAR")*

B34 Facile and Efficient Synthesis of ^{125}I-Labeled Hyaluronic Acid, Sang Hyun Park *(KAERI/Univ of Science and Technology),* So-Young Ma, Dong-Eun Lee, Dae Seong Choi *(KAERI)*

B35 Spatial Resolution of Ionization Chamber Arrays in ^{60}Co Radiotherapy, Qiang Du, Zhifang Wu, Guilai Xing *(Beijing Key Lab/Tsinghua Univ)*

B36 Enhanced Kinase Assay Based on Radio-Phosphorylation, Sang Hyun Park *(KAERI/Univ of Science and Technology),* Jong Kook Rho, Mi Hee Choi *(KAERI)*

B37 Determination of the Labeling Yield and Stability of the Complexes Bi-BSA-DOTA and Bi-BSA-DTPA, R. F. Nurtdinov, P. P. Boldyrev, D. Yu. Chuvilin, S. M. Deev, V. A. Golovachenko, V. I. Nikolaev, V. Y. Panchenko, M. A. Prochin, Yu. A. Yashin, S. Zakharov, A. Zagryadskii *(Kurchatov Institut)*

B38 Evaluation In-House Manufactured [^{99m}Tc]-ECDG in Different Animal Models Relative to Normal Distributation, Tumour- and Infection Detection, J. Wagener *(Nesca),* J. Horn-Lodewyk, A. C. Otto, M. Janse van Vurren *(Universitas Hospital),* J. van Staden, S. Lamprecht *(University of the Free State),* V. Kleinhans, A. Coetzee, C. Bester *(North-West Univ),* J. R. Zeevaart *(Necsa/North-West Univ)*

INDUSTRY AND AGRICULTURE

B39 Reproductive Performance of Crossbred Dairy Cows in Bangladesh: An Isotopic Radiommunoassay Study, M. A. Samad Khan, M. S. R. Siddiki, M. E. Uddin *(Bangladesh Agricultural Univ)*

B40 Consideration of Sky-Shine Radiation Effects for the Development of Korean Regulatory Guide on Industrial Radiography, Yong Ki Chi, Bokyun Seo, Wan-Tae Kim *(KINS)*

B41 Design of Silicon Photomultiplier Based Optical Fiber Dosimeter with Scintillator for High-Dose Radiation Detection in Nuclear Wastes and Radiosurgery, J. H. Kim, K. S. Joo *(Myongji Univ)*

B42 High Quality Kapton Sandwich ^{22}Na Radioactive Sealed Source for Positorn Annihilation Liftime Spectroscopy, T. Yamada, H.Ishizu, R. Chika *(Japan Radioisotope Association),* M. Yamawaki *(NIAIST)*

B43 Preparative and Analytical RadioHPLC of Indole-3-[1-^{11}C] Acetic Acid for PET Imaging of Auxin Transport in Living Plant, Andrea M. Jedele, Paul A. Ellison, Dhanabalan Murali, Todd E. Barnhart, Robert J. Nickles, Onofre T. DeJesus *(Univ of Wisconsin, Madison)*

B44 A Study on Alloy Compensation in Isotope Thickness Measurement of Steel, Xiaomin Zhang, Zhifang Wu *(Tsinghua Univ)*

B45 A Functional Plant PET Imager with Controllable Environment and Configurable Geometry, Qiang Wang, Aswin J. Mathews, Ke Li, Sergey Komarov, Homayoon Ranjbar, Patrick Zerkel, Joseph A. O'Sullivan, Yuan-Chuan Tai *(Washington Univ)*

B46 Biological Full Value and Safety of Crops Produced by Using Radiation Engineering Technology, A. V. Ivanov, A. A. Ivanov, G. V. Konyukhov, R. R. Gayzatullin *(Federal State Budgetary Institution)*

B47 Mineralisation of ^{14}C-Labelled Glucose in Litter and Soils from Sugarcane Fields as Affected by Mineral Nitrogen, Eduardo Mariano, C. O. Trivelin *(USP),* Paul W. Hill, Davey L. Jones *(SENERGY/Bangor Univ)*

PRODUCTION OF PET RADIONUCLIDES

Session Organizer: Syed M. Qaim *(Forschungszentrum Juelich),* Suzanne Lapi *(Washington Univ)*
Cochairs: Suzanne Lapi *(Washington Univ, St.Louis),* Ingo Spahn *(Research Centre Jülich)*

Toronto – 3:00 p.m.

3:00 p.m.
Production Scale Purification of Ge-68 from Irradiated Gallium Metal, Jonathan M. Fitzsimmons, Leonard F. Mausner *(BNL),* invited

3:20 p.m.
High Power Water Targets for the Production of ^{18}F—Review of Design Features and Analytical Techniques, Matthew H. Stokely, Johanna L. Peeples *(BTI Targetry LLC),* J. Michael Doster *(NCSU),* Timothy A. Faugl *(BTI Targetry LLC/NCSU),* Igor A. Bolotnov *(NCSU),* Michael C. Poorman *(BTI Targetry LLC),* Gerald T. Bida *(Duke Unv),* Bruce W. Wieland *(BTI Targetry LLC),* invited

3:40 p.m.
Cyclotron Production of ^{44}Sc for Radiopharmaceutical Applications, Maruta Bunka *(Univ of Bern),* Cristina Mueller, Nicholas van der Meulen *(Paul Scherrer Inst),* Roger Schibli *(Paul Scherrer Inst/ETH Zurich),* Andreas Tuerler *(Univ of Bern/Paul Scherrer Inst)*

3:55 p.m.
Development of the Non-Standard PET Radionuclides ^{45}Ti ^{73}Se and ^{75,76} Br, Heinz H. Coenen, Ingo Spahn *(FzJ),* invited

4:15 p.m.
Sustainable PET Tracer Production at Wisconsin: Stayin' Alive, R. J. Nickles, T. E. Barnhart, O. T. DeJesus, B. T. Christian *(Univ of Wisconsin, Madison),* invited

4:35 p.m.
Production of Longer Lived Positron Emitters at BNL, Leonard F. Mausner, Dmitri G. Medvedev, Jonathan M. Fitzsimmons *(BNL),* invited

4:55 p.m.
Zirconium-89: From Production to Clinical Application, Danielle J. Vugts, Guus A. M. S. van Dongen *(VU Univ Medical Center),* invited

5:15 p.m.
New Developments in the Production of Generator Systems for Positron Emitters, Frank Roesch *(Univ of Mainz),* invited

5:35 p.m.
Radionuclide Production Using a Compact, Low-Energy Accelerator System, William D. Webster, Geoffrey T. Parks *(Univ of Cambridge),* Dmitry Titov *(Siemens Ltd),* Paul Beasley *(Siemens CT TIP Technology and Concepts),* Oliver Heid *(Siemens AG)*

5:50 p.m.
Isotopes for Combined PET/SPECT Imaging, Chary Rangacharyulu, Christine K. Roh *(Univ of Saskatchewan)*

6:05 p.m.
Potential Contaminated Emissions Due to PET Technologies Operation, O. Bezshyyko *(Taras Shevchenko National Univ),* B. Bondar *(Taras Shevchenko National Univ/All-Ukrainian Center for Radiosurgery of the Clinical Hospital "Feofania"),* T. Govoruha *(Kyiv City Oncological Clinical Center),* L. Golinka-Bezshyyko, I. Kadenko *(Taras Shevchenko National Univ),* V. Kirichenko *(Kyiv City Oncological Clinical Center),* Ya. Kmetyuk *(All-Ukrainian Center for Radiosurgery of the Clinical Hospital "Feofania"),* O. Shevchenko *(Kyiv City Oncological Clinical Center)*

ECONOMICS OF RADIOISOTOPE PRODUCTION AND SUSTAINABILITY– PAPERS/PANEL

Session Organizer: Ron Francis Cameron *(OECD-NEA)*
Session Cochairs: Roy W. Brown *(Mallinckrodt Pharmaceuticals),* Henri Bonet *(IRE, retired)*

Acapulco – 3:00 p.m.

PAPERS:

3:00 p.m
European Union's Efforts to Sustain the Supply of Mo-99, Remigiusz Baranczyk, Stamatios Tsalas *(EC/Euratom Supply Agency),* Guy Y. Turquet de Beauregard *(AIPES),* invited

3:20 p.m
Sustainability of LEU Based ^{99}Mo Manufacturing, P. A. Louw *(NTP Radioisotopes SOC Ltd),* invited

3:40 p.m
Production Capacities of Mo-99/Tc-99m Manufacturing Enterprises Within ROSATOM State Corporation's Isotope Complex, Aleksey Vakulenko *(JSC Isotope)*

PANEL DISCUSSION:

The supply reliability of Mo-99 has declined over the past decade, due to unexpected or extended shutdowns at the few ageing, Mo-99 producing, research reactors and processing facilities. In addition to the ongoing concerns related to long-term reliability, all current long-term, major 99 Mo-producing countries have agreed to convert to using low-enriched uranium (LEU) targets for the production of 99 Mo. This decision was made based on important non-proliferation reasons; however, the conversion will have potential impacts on the global supply chain, both in terms of costs and available capacity. This topic will bring together panelists and contributing researchers and developers for a look at the near and long-term future.

PANELISTS:

- Henry Bonet *(IRE-retired, Belgium)*
- Roy W. Brown *(Mallinckrodt, USA)*
- Guy Y. Turquet de Beauregard *(AIPES, Belgium)*
- Pieter Auret Louw *(NTP Radioisotopes SOC Ltd, South Africa)*
- Aleksey Vakulenko *(JSC Isotope, Russia)*

SECURING THE SUPPLY OF ISOTOPES IN THE FUTURE–PAPERS/PANEL

Session Organizer: Richard August Henkelmann *(ITG)*
Cochairs: Richard August Henkelmann *(ITG),* Robert Atcher *(LANL)*

Acapulco – 4:30 p.m

PAPERS:

4:30 p.m
Commercial Production of Ge-68, William C. Uhland *(Mallinckrodt)*

4:45 p.m
Heavy Isotopes Lead Material Management Organization (LMMO), Bradley D. Patton, Sharon M. Robinson *(ORNL)*

5:00 p.m
The U.S. Department of Energy Isotope Development and Production for Research and Applications Program, Robert W. Atcher *(LANL)*

PANEL DISCUSSION:

Industry has to focus on the production of new radioisotopes for better imaging and more efficient therapy. The lecturers and Panelists will give an overview on radioisotopes as Ga-68, Rb-82, Ho-166, Gd-161 and Lu-177. Methods of regular and efficient production, applications and advantages of these isotopes will be presented. The supply of enriched stable isotopes as target material for irradiation in accelerators and reactors will be reviewed. While the number of accelerators, mainly cyclotrons, is steadily increasing the availability of reactors with reasonable high neutron flux and operation time has become a strong concern.

PANELISTS:

- Bernard Ponsard *(SCK.CEN - BR2 Reactor, Belgium)*
- Rostislav Kuznetsov *(JSC State Scientific Center, Russia)*
- Wolfgang Runde *(Los Alamos National Laboratory, USA)*
- Pieter Louw *(NTP Radioisotopes, South Africa)*
- Darren Brown *(Trace Sciences International Corp, Canada)*
- Richard Henkelmann *(Isotope Technologies Garching, Germany)*

MEDIUM AND HIGH ENERGY ACCELERATOR/ CYCLOTRON PRODUCTION OF ISOTOPES

Session Organizers: Boris Zhuikov *(RAS),* Francois Meiring Nortier *(LANL)*
Cochairs: F. Meiring Nortier *(LANL),* Boris Zhuikov *(RAS)*

Crystal A – 3:00 p.m.

3:00 p.m.
An Overview of North American Intermediate-Energy Facilities and Isotope Production Capabilities, Kevin D. John, Eva R. Birnbaum *(LANL),* invited

3:20 p.m.
The Future of Isotope Production on Medium and High Energy Proton Beams, Boris L. Zhuikov *(RAS),* invited

3:40 p.m.
Medium Energy Accelerators for Isotope Production in Europe, F. Haddad *(Subatech/GIP Arronax),* invited

4:00 p.m.
Experiences with Bombardments, Monitoring and Interlocking in High-Intensity Split-Beam Operations Using 66 MeV Protons Delivered by a Separated Sector Cyclotron, C. Vermeulen, G. F. Steyn, N. P. Stodart *(iThemba Labs),* invited

4:20 p.m.
The Status and RI Production Plan of KOMAC, Kye-Ryung Kim, Sang-Pil Yoon, Yong-Sub Cho *(KAERI),* invited

4:40 p.m.
Isotope Production Using a Superconducting Electron Linac, Terry L. Grimm, Chase H. Boulware, Dyle D. Henning, Jerry L. Hollister, Erik S. Maddock, Valeriia N. Starovoitova *(Niowave Inc.),* Frank Harmon, Jon L. Stoner *(Idaho State Univ)*

4:55 p.m.
Production of Medical Isotopes from a Thorium Target, GIP Arronax Irradiated by Light Charged Particles Up to 68 MeV, Charlotte Duchemin, Arnaud Guertin *(Univ de Nantes),* Ferid Haddad, *(Subatech/GIP Arronax),* Vincent Métivier *(Univ de Nantes),* Nathalie Michel *(GIP Arronax)*

5:10 p.m.
Recent Developments Using Polymer Assisted Deposition in Fabricating Radioactive Targets for Nuclear Reactions, Thomas F. Wall, Heino Nitsche *(Univ of Calif-Berkeley)*

SEPARATION CHEMISTRY AND TARGET PREPARATION FOR NUCLEAR CHEMISTRY EXPERIMENTS

Session Organizer: Heinz Walter Gaeggeler *(Paul Scherrer Inst)*
Cochairs: Sharon Robinson *(ORNL),* Matthias Schaedel *(JAEA/GSI)*

Hong Kong – 3:00 p.m.

3:00 p.m.
Heavy Element Program at Oak Ridge National Laboratory, Julie G. Ezold, Rose A. Boll, L. Keven Felker *(ORNL),* invited

3:20 p.m.
Adventures in Californium Purification and Electrodeposition, Jonathan D. Burns, Shelly M. Van Cleave, Edward H. Smith, Rose A. Boll *(ORNL)*

3:35 p.m.
High Accuracy Fission Product Measurements for the Qualification NpO_2 Targets for the Production of Plutonium-238, Benjamin D. Roach, Jeffrey S. Delashmitt, Joseph M. Giaquinto, Ian C. Gauld, Ralph H. Ilgner, Tamara J. Keever, Rob R. Smith *(ORNL)*

3:55 p.m.
NPL's Programme for the Preparation of Neutron Deficient Lanthanides, Actinides and Other Elements, Simon Jerome, Peter Ivanov, Cyrus Larijani *(National Physical Lab),* David Parker *(Univ of Birmingham),* Patrick H. Regan *(National Physical Lab/Univ of Surrey)*

4:10 p.m.
Fluorescent BINOL-Based Sensor for Thorium Recognition, Jun Wen, Sheng Hu, Tong-Zai Yang, Xiao-Lin Wang (*China Academy of Engineering Physics)*

4:25 p.m.
Evaluation of Hydrogen Isotopes Separation by Catalityc Isotope Exchange in Liquid Phase, Gheorghe Ionita, Ciprian Bucur, Ionut Spiridon, Ioan Stefanescu *(Inst for Cryogenics and Isotopic Separation)*

HEAVY AND SUPERHEAVY ELEMENTS RESEARCH

Session Organizers: Andreas Türler *(Paul Scherrer Inst),* Heinz W. Gaeggeler *(Paul Scherrer Inst)*
Cochairs: Andreas Tuerler *(Paul Scherrer Inst.),* Julie Ezold *(ORNL)*

Hong Kong – 4:40 p.m.

4:40 p.m.
From Medelevium to Flerovium—Probing Relativistic Effects in Heavy and Superheavy Element Chemistry Experiments, Matthias Schädel *(JAEA),* invited

4:55 p.m.
Mapping the N=152 Deformed Shell Closure with High-Precision Penning-Trap Mass Measurements of Transuranium Nuclides at TRIGA-TRAP, D. Renisch *(Institut für Kernchemie),* T. Beyer, K. Blaum *(Max-Planck-Institut für Kernphysik),* M. Block *(GSI Helmholtzzentrum für Schwerionenforschung),* Ch. E. Düellmann *(Instit für Kernchemie/GSI Helmholtzzentrum für Schwerionenforschung),* K. Eberhardt *(Institut für Kernchemie/Helmholtz-Institut Mainz)),* M. Eibach *(Max-Planck-Institut für Kernphysik),* J. Grund *(Institut für Kernchemie),* Sz. Nagy *(Max-Planck-Institut für Kernphysik),* W. Nöertershaeuser *(GSI Helmholtzzentrum für Schwerionenforschung /Technische Universität Darmstadt),* F. Schneider *(Institut für Kernchemie/ JGU Mainz)*

5:10 p.m.
Toward the Aqueous Chemistry of Copernicium Utilizing Homologue Separations, Philip Raymond Mudder, Heino Nitsche (*University of California, Berkeley/LBNL)*

5:25 p.m.
Recovery of ^{248}Cm from ^{252}Cf Decay, Laetitia H. Delmau, L. Kevin Felker *(ORNL)*

ISOTOPES IN PLANT BIOLOGY: FUTURE SUSTAINABILITY IN ENERGY AND AGRICULTURE—I

Session Organizers: Richard A. Ferrieri *(BNL),* Ben Babst *(BNL)*
Cochairs: Lee Sobotka (*Washington Univ, St. Louis),*
Prem Srivastava *(DOE)*

Crystal C – 3:00 p.m.

3:00 p.m.
PhytoPET, PhytoBeta and PhytoSPECT: Radioisotope Imaging Systems Being Developed for Plant Biology Research, Andrew Weisenberger *(Thomas Jefferson National Accelerator Facility),* invited

3:20 p.m.
Technologies for Quantitative, Non-Destructive, and 3D Imaging of Plant Function, Paul Vaska, David J. Schlyer, Craig L. Woody *(BNL),* invited

3:40 p.m.
Live-Imaging Technologies at Center Stage: Can They Provide Practical Answers in Plant Nutrition?, Shu Fujimaki *(JAEA),* invited

4:00 p.m.
Imaging Uptake, Transport, and Distribution of Radiotracers in *Brassica Oleracea* Using Positron Emission Tomography, Paul A. Ellison, Elizabeth O. Ahlers, Todd E. Barnhart, Tom Bryan, Alexander K. Converse, Samuel T. Doran, Jackson D. Hetue, Andrea M. Jedele, Katherine A. Lake, Robert J. Nickles, Paul H. Williams, Onofre T. DeJesus *(Univ of Wisconsin, Madison),* invited

4:20 p.m.
Statistical Analysis of Carbon Fixation and Translocation in *Arabidopsis* Seedlings on Petri Dish by Using Positron-Emitting Tracer Imaging System (PETIS), Naoki Kawachi *(JAEA),* Atsushi Koyanagi *(JAEA/Tokyo Univ of Science),* Nobuo Suzui, Yong-Gen Yin, Satomi Ishii *(JAEA),* Hiroaki Shimada (*Tokyo Univ of Science),* Shu Fujimaki *(JAEA)*

4:40 p.m.
Combined 3D PET and Optical Projection Tomography Techniques for Root Phenotyping, Qiang Wang, Sergey Komarov, Aswin J. Mathews, Ke Li *(Washington Univ),* Christopher Topp *(Donald Danforth Plant Science Center),* Joseph A. O'Sullivan, Yuan-Chuan Tai *(Washington Univ)*

5:00 p.m.
MRI-PET Measurements for Scoring Root Traits in the Soil, Siegfried Jahnke, Dagmar van Dusschoten, Ralf Metzner, Jonas Büehler, Gregor Huber, Daniel Pflugfelder, Matthias Streun, Simone Beer, Ulrich Schurr *(FzJ),* invited

ISOTOPE RECOVERY AND RECLAMATION

Session Organizer: Dorothea Schumann *(Paul Scherrer Inst)*
Cochairs: Dorothea Schumann *(Paul Scherrer Inst.),* Henri Bonet *(IRE, retired)*

Hong Kong – 8:00 a.m.

8:00 a.m.
Accelerator Waste at PSI—A Source for Exotic Isotopes, Rugard Dressler, Dorothea Schumann *(Paul Scherrer Inst),* invited

8:20 a.m.
Preserving ^{244}Pu and Heavy Curium in Mark-18A Targets, Sharon Robinson, Bradley Patton *(ORNL)*

8:40 a.m.
Separation of Isobaric Interferences in HR-ICP-MS, Niko Kivel, Heiko-Dirk Potthast, Dorothea Schumann *(Paul Scherrer Inst)*

9:00 a.m.
Development of a New Versatile Analytical System for Isotope Analysis, Heiko Dirk Potthast, Niko Kivel *(Paul Scherrer Inst)*

9:20 a.m.
Recycling of ^{241}AmBe Neutron Sources, Joseph Lapinskas *(QSA GLOBAL Inc.)*

9:40 a.m.
Separation of 7-Be from the Cooling Water of a Neutron Spallation Source, Dorothea Schumann (*Paul Scherrer Inst),* Marin Ayranov *(EC, DG-Energy),* Tanja Stowasser *(Paul Scherrer Inst)*

PRODUCTION AND APPLICATION OF ALPHA EMITTERS

Session Organizers: Alfred Morgenstern *(EC JRC),* Bryan Bednarz *(Univ of Wisconsin)*
Cochairs: Bryan Bednarz *(Univ of Wisconsin, Madison),* Michael Zalutsky *(Duke Univ Medical Center)*

Toronto – 8:00 a.m.

8:00 a.m.
^{213}Bi-DOTATOC Receptor Targeted Alpha-Radionuclide Therapy Induces Remission in Neuroendocrine Tumors Refractory to Beta-Radiation—A First in Human Study, F. L. Giesel, C. Kratochwil *(Univ Hospital Heidelberg),* F. Bruchertseifer *(Inst for Transuranium Elements, EC),* W. Mier *(Univ Hospital Heidelberg),* C. Apostolidis *(Inst for Transuranium Elements, EC),* U. Haberkorn *(Univ Hospital Heidelberg),* A. Morgenstern *(Inst for Transuranium Elements, EC),* invited

8:20 a.m.
Large-Scale Production of Actinium-225, Jonathan W. Engle, Eva R. Birnbaum, Hong T. Bach, Michael E. Fassbender, Eric R. Olivas *(LANL),* David Denton, Saed Mirzadeh *(ORNL),* Dmitri Medvedev, Leonard Mausner *(BNL),* Francois M. Nortier, Kevin D. John *(LANL),* invited

8:40 a.m.
Application of HPLC for Selective Separation of Accelerator-Produced ^{225}AC from ^{140}LA, and Other Lanthanide Radioisotopes, J. Giaquinto, D. L. Denton, I. Ilgner, J. M. Cosgrove *(ORNL),* D. G. Medvedev, L. F. Mausner *(BNL),* S. Mirzadeh *(ORNL)*

8:55 a.m.
Targeted Liposomes Loaded with Actinium-225 for Antivascular Alpha-Particle Therapy, Stavroula Sofou, Amey Bandekar, Chalres Zhu *(RutgersUniv),* Sangeeta Ray Banerjee, Martin Pomper *(Johns Hopkins Medical School),* Frank Bruchertseifer, Alfred Morgenstern *(EC JRC),* invited

9:15 a.m.
Radioactive Nanoparticles, A. Bilewicz, A. Piotrowska, E. Leszczuk, L. Janiszewska, P. Koźmiński *(Inst of Nuclear Chemistry and Technology),* A. Morgenstern, F. Bruchertseifer *(Inst for Transuranium Elements, JRC),* invited

9:35 a.m.
Investigation of Astatine Chemistry in Solution, G. Montavon *(Subatech),* N. Galland *(CEISAM),* invited

9:55 a.m.
Dosimetric Assessment of Radium-223 Radionuclide Therapy Using Whole Body Pharmacokinetic Modeling, Muhammed Bedir, Benjamin Cox, Stephen Graves, Sabrina Hoffman, Kurt Pedersen, Alexandra Schroeder, Natalie Weisse, Bryan Bednarz *(Univ of Wisconsin-Madison)*

ISOTOPES IN PLANT BIOLOGY: FUTURE SUSTAINABILITY IN ENERGY AND AGRICULTURE—II

Session Organizers: Richard A Ferrieri *(BNL),* Ben Babst *(BNL)*
Cochairs: Siegfried Jahnke *(Research Centre Jülich),* Paul Ellison *(Univ of Wisconsin, Madison)*

Crystal C – 8:00 a.m.

8:00 a.m.
Use of ^{11}C to Study Sugar Transport and Partitioning in Bioenergy Crop Sorghum, Abhijit Karve, David Alexoff, Dohyun Kim, Michael Schueller *(BNL),* David Braun *(Univ of Missouri, Columbia),* Ismail Dweikat *(Univ of Nebraska),* Benjamin Babst *(BNL),* invited

8:20 a.m.
Carbon Partitioning in Soybeam Leaves by Combined ^{11}C and ^{13}C Labeling, R. C. Dirks, M. Singh, G. S. Potter, Lee G. Sobotka, J. Schaefer *(Washington Univ),* invited

8:40 a.m.
Allocation and Partitioning of Recently Fixed Carbon as ^{11}C in *Arabidopsis Thaliana,* Abigail P. Ferrieri *(Max-Planck Institute for Chemical Ecology),* Beverly Agtuca *(State Univ of New York Environmental Science and Forestry),* Heidi M. Appel *(Univ of Missouri),* Richard A. Ferrieri *(BNL),* Jack C. Schultz *(Univ of Missouri),* invited

9:00 a.m.
Mobility of Immune Ligands and Signal Molecules in the Model Plant Arabidopsis, Jean T. Greenberg, Joanna Jelenska, Nicolas Cecchini *(Univ of Chicago),* Sandra M. Davern, Robert F. Standaert *(ORNL/Univ of Tennessee),* Saed Mirzadeh *(ORNL),* Andrew N. Gifford *(BNL),* invited

9:20 a.m.
Short-Lived Radioisotopes to Investigate if Fungal Symbionts in Plants are Parasites or Mutualists, Chantal D. Reid, Greg Bonito *(Duke Univ),* Larry Cumberbatch *(Duke Univ/ Triangle Univ Nuclear Lab),* Andrii Gryganskyi *(Duke Univ),* Alex Crowell, Calvin R. Howell *(Duke Univ/Triangle Univ Nuclear Lab),* invited

9:40 a.m.
Providing Foundational Knowledge of Resource Allocation and Stem Growth Regulation in Bioenergy Crops, Benjamin A. Babst *(BNL),* David Braun *(Univ of Missouri, Columbia),* David Alexoff, Youwen Xu, Wenchao Qu *(BNL),* Anna Kunert *(Johannes Gutenberg Univ),* Michael Schueller, Ryan Tappero, Lisa Miller *(BNL),* invited

APPLICATIONS OF RESEARCH AND INDUSTRIAL ISOTOPES

Session Organizer: Meera Venkatesh *(IAEA)*
Cochairs: Elisabete Fernandes (*CENA),* Meera Venkatesh *(IAEA)*

Acapulco – 8:00 a.m.

8:00 a.m.
Radiotracer Generators for Application in Process Industries, Tor Bjørnstad *(IFE/Univ of Oslo),* Liv Stavsetra, Kristin Fure, Are Haugan *(IFE),* invited

8:20 a.m.
Applications and Impact of Radiotracers and Nucleonic Measurement Systems for Investigation of Sediment Transport, Jefferson Vianna Bandeira, Lécio Hannas Salim *(Brazilian Nuclear Energy Commission),* Patrick Brisset *(IAEA),* Catherine E. Hughes *(ANSTO),* invited

8:40 a.m.
Polarized ^{3}He Spin Filters for Neutron Science, Thomas R. Gentile *(NIST),* invited

9:00 a.m.
Development of Radioactive Nano Particles for Industrial Application, Sung-Hee Jung *(KAERI),* Sung-Ho Choi *(Hannam Univ),* Jin-Ho Moon, Jong-Bum Kim *(KAERI),* Min-Seok Oh, Sang-Ei Seo *(Hannam Univ)*

9:15 a.m.
Investigation of the Impact of Dense Vertical Internals on Hydrodynamics in Bubble Column Reactors Using Advanced Measurement Techniques, Mohammed Al Mesfer *(King Khalid Univ),* Muthanna Al-Dahhan *(Missouri Univ Sci Tech)*

9:30 a.m.
Utilization of Enriched Stable Isotopes to Increase Isotope Reactor Output and Improve the Quality of Radioisotope Sealed Sources, Robert Neal Brosofsky *(QSA Global, Inc)*

9:45 a.m.
Research on Cobalt-60 Spiral CT for Studying Fuel Sphere's Motion Law in HTGR, Ximing Liu, Zhifang Wu, Peng Cong, Jichen Miao *(Tsinghua Univ)*

CLOSING PLENARY

Session Organizer: Paul T. Dickman *(ANL),* Rolf Zeisler *(NIST),* Stephen P. LaMont *(LANL)*
Cochairs: Paul Dickman *(ANL),* Wessel Van Zyl de Villers *(IAEA)*

Crystal B – 10:20 a.m.

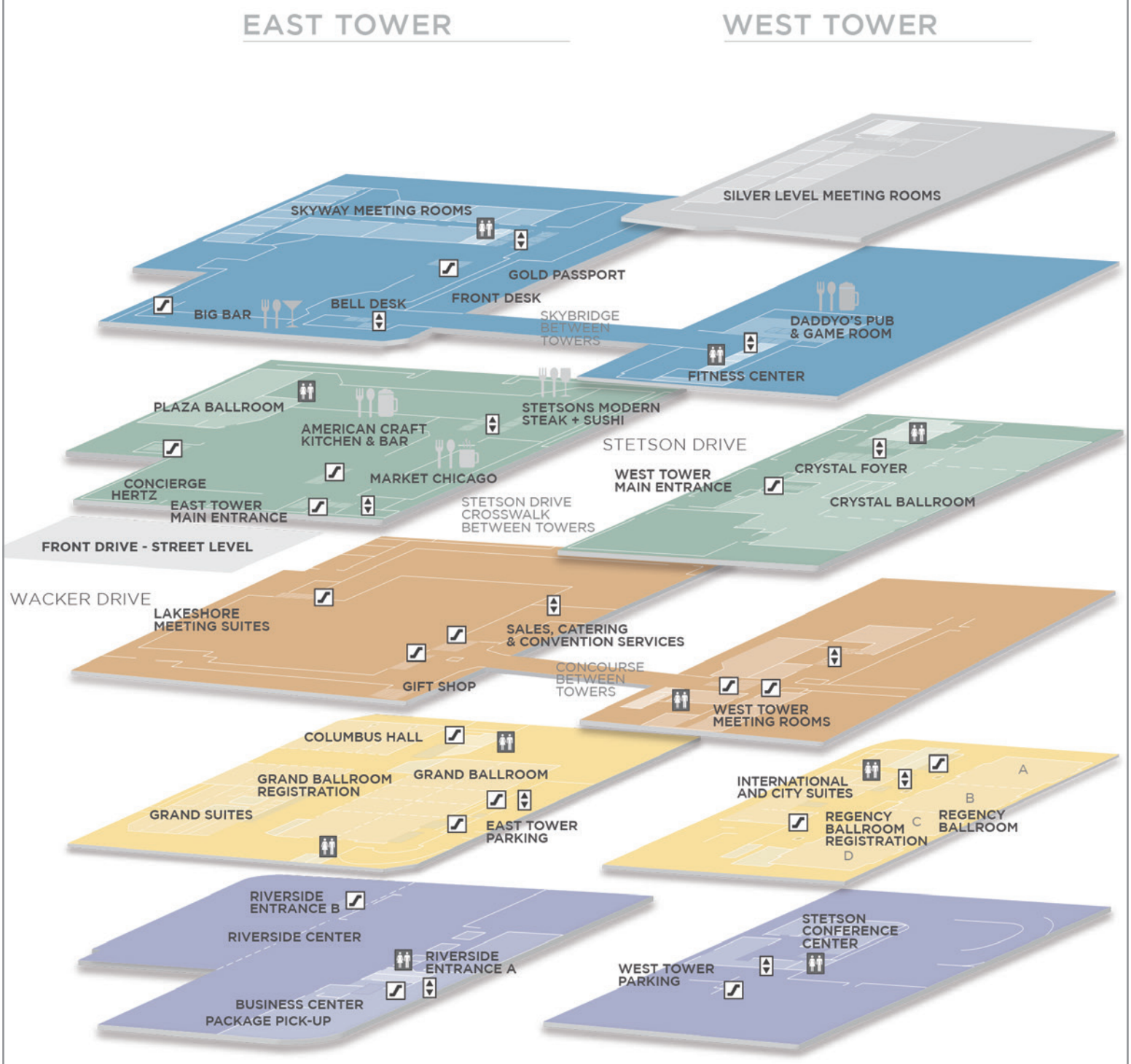
10:20 a.m.
Emerging Applications of Nuclear and Isotopic Techniques in the Environmental Sciences, Timothy E. Payne *(ANSTO),* invited

10:45 a.m.
Heavy and Super Heavy Elements Research, Andreas Türler *(Paul Scherrer Inst/Univ of Bern)*, invited

11:10 a.m.
The Future of Molecular Imaging: A Radiochemist's Perspective, Henry F. VanBrocklin *(Univ of California San Francisco),* invited

11:35 a.m.
Closing Ceremony and Presentation on the 9th International Conference on Isotopes in Doha Qatar in 2017

HYATT REGENCY CHICAGO



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CROSSING BETWEEN TOWERS: Cross between towers via the Blue Level Skybridge or the Concourse on the Bronze Level. You may also cross on the Green Level via the crosswalk on Stetson Drive.

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