BRIEFING NOTE

11th International Conference on Isotopes (11ICI)

Background:

- 11ICI hosted by <u>Sylvia Fedoruk Canadian Centre for Nuclear Innovation Inc.</u> (the Fedoruk Centre) in partnership with the <u>University of Saskatchewan</u> (USask) and <u>Tourism Saskatoon</u>, builds on past conferences by continuing a multifaceted interdisciplinary exchange between the developers, producers and users of isotopes with applications of isotopes in medicine, industry, agriculture, national security and allied fields for both research and development.
- ICI events have been held since 1995, recently every two years. They are organized by the <u>World Council on Isotopes (WCI)</u> and a participating organization to highlight the importance of nuclear science, medicine, and technology in advancing human health and protection of the environment.
- This conference will showcase the rich history of USask in research and applications of nuclear science and technologies dating back to the 1930s. It will highlight the latest scientific developments in the areas of nuclear imaging, isotope production and research, and advancements in cancer treatment.
- The event in 2023 will welcome over 300 global leaders and young researchers from industry, academia and national organizations engaged in the use and policies of nuclear isotopes for health, agriculture, environmental and industrial applications.
- 11ICI will be held on July 23 27, 2023 at TCU Place in Saskatoon.

Opportunity:

Isotopes are around us as natural occurring elements, providing with invaluable resources for various industries such as medicine, energy, environment, extraction and mining, and natural resources. They are used daily in cancer diagnostics and therapy, generating clean energy, oil excavation and geological characterizations, agriculture and plant sciences, welding, and materials analysis. The isotopes industry has entered a transformative process to satisfy the growing demand of the use of their isotopes particularly in nuclear medicine and clean energy. Large organizations such as Bruce Power, Ontario Power Generation Inc., and Laurentis Energy Partners (an OPG company) have joined the efforts to develop new technologies for production of medical isotopes using their current capabilities.

The development of Small Modular Reactors is seen as a viable source for delivery of clean energy. After the historic signing of the Memorandum of Understanding on Small Modular Reactors by the premiers of Ontario, Saskatchewan, New Brunswick, and Alberta committing to work together to explore the development of nuclear power deployment as a source of clean energy, key players of the isotopes industry changed their focus towards creating new strategic partnerships to provide critical materials in support of this initiative.

11ICI presents an occasion for government officials and other individuals to contribute to Panel discussions by providing keynote speakers and research abstracts the opportunity to update on their contributions and activities in the following areas:

- Canadian Strategy for Nuclear Power Deployment Small Modular Reactors (SMRs), Nuclear Power Plants Canadian specialists and policy makers will discuss about strategies on generating nuclear power a source of safe, clean, affordable energy, opening opportunities for a resilient, low-carbon future.
- **Policy Perspectives** In a panel moderated by Paul T. Dickman (Senior Policy Fellow, Argonne National Laboratory, USA), Canadian policymakers and specialists will have an open discussion with their counterparts from USA, Europe, Asia, and IAEA.
- Demand and supply of isotopes Specialists will discuss current trends and challenges in supply of medical isotopes.
- Regulatory Considerations (nuclear session and pharma session) specialists will discuss regulatory aspects about production and handling isotopes and derived radioactive compounds used in nuclear medicine.
- **Environment** Specialists and members of the local authorities will listen to international perspectives on the impact of nuclear activities on the environment.
- **Enrichment and Separation** In a plenary, delegates from Canada, USA, and other countries with activities in isotope enrichment and separation will discuss challenges and opportunities related to the use of enriched isotopes.

The conference is supported by Canadian Nuclear Laboratories, Canadian Nuclear Isotopes Council, Atomic Energy Canada Limited (AECL), Prairies Canada, Innovation Saskatchewan, International Atomic Energy Agency (IAEA), American Nuclear Society, OECD Nuclear Energy Agency (NEA), National Research Council, Government of Saskatchewan, Bruce Power, SaskPower, Cameco, Orano, World Council on Isotopes, Women in Nuclear, Canada and other international organizations.

We are expecting more than 300 participants to attend the conference this summer. For more information, visit the <u>conference</u> <u>website</u> and join our mailing list get the latest updates on the conference planning.

EXTRA BACKGROUND

Themed "Isotopes around us, their applications and beyond", 11ICI will provide participants with invaluable opportunities to explore and discuss state-of-the art isotope science and technology advancements and their application in medicine, the environment, industry, and agriculture.

The conference will highlight the latest advancements in the industry along with scientific and technological developments in the following areas of interest:

- Production of isotopes
- Extraction of isotopes and uranium mining
- Nuclear physics research
- Application of isotopes in medicine and life sciences
- Application of isotopes in agriculture and industry
- Radio-analytical chemistry, radiochemistry and radiopharmaceuticals

Women in Nuclear – Marie Curie, Harriet Brooks, Sylvia Fedoruk Plenary – **Melissa Denecke**, Recipient George Hevesy Medal Award 2023, Director Division Physical & Chemical Sciences, International Atomic Energy Agency (IAEA) and **Lisa Mc Bride**, President, Women in Nuclear (WiN) will highlight women's dedication and work in nuclear sciences.

Paul T. Dickman, Senior Policy Fellow, Argonne National Laboratories, US welcomes **Amy Gottschling**Vice-President Science, Technology & Commercial Oversight Atomic Energy Canada Limited (AECL) for a discussion around the *Policy Perspectives* around isotopes and nuclear technologies.

Joe McBrearty, Chief Executive Officer, Canadian Nuclear Laboratories

Paul Schaffer Associate Laboratory Director, TRIUMF and

Professor Syed M. Qaim, Advisor, Vice-Director (retired) Forschungszentrum Julich, Germany
Will welcome the participants during the opening plenary sessions.

The delegates will take part in the *WCI President's Forum* moderated by Jong Kyung Kim President of the World Council on Isotopes, - where the invited speakers on the Forum will present and talk about *'Public Perception on Radiation,'* which is always raised in the use of radioisotopes in the field. WCI Presidents (current and incoming) will open the floor to the delegates for a discussion.

During three technical tours, delegates will visit three state-of-the-art nuclear facilities - the <u>Saskatchewan Cyclotron Facility</u>, a fully equipped facility for isotope production, radiochemistry research and nuclear imaging. The facility features the latest nuclear imaging system adapted for plants; an innovative tool designed by local scientists. Delegates will also visit the <u>Canadian Light Source</u> (CLS), Canada's world-class facility for materials research with synchrotron light. The third facility on the tour includes the <u>Allard-Roozen Imaging Suite</u> located at the Western College of the Veterinary Medicine (WCVM) and accommodates a clinical size PET/CT scanner. The WCVM is only one of six other North American Universities with Veterinary Colleges equipped with full imaging capabilities for animals including PET/CT, SPECT/CT, and Xray for large animals.



Appendix 1 Schedule at a glance

	July 20-22 (Thur-Sat) potentially July 23 morning	Sunday, July 23,2023	Monday Ju	uly 24, 2023	Tuesday July	25, 2023	Wednesday, July 26, 2023	Thursday July 27, 2023
	Summer School	CNIC leaders' summit	BREAKFAST		BREAKFAST		BREAKFAST	BREAKFAST
АМ			General Plenary		Marie Curie-Harriet Brooks Sylvia Fedoruk Session (Plenary/Panel)		Demand and Supply of Isotopes for Medicine – A global Perspective (Plenary/Pannel)	Environmental (Plenary/Panel)
			COFFEE	E BREAK	COFFEE BI	REAK	COFFEE BREAK	COFFEE BREAK
			Concurrent Sessions		Nuclear physics research; Isotopes in Cosmos and Astrophysics Keynote speaker		Concurrent Sessions	Concurrent Sessions
					Concurrent Sessions			
			LUNCH		LUNCH		LUNCH	
			Policy Perspe	ectives Forum	Canadian Strategy for Nuclear Power Depl	oyment -SMR, Nuclear Power Plants	WCI President's Forum "Radiation Phobía"	Lunch / 12 ICI Announcement and Closing
РМ			Concurrent Sessions		Isotopes Extraction, Enrichment and Separations		WCI President's Forum "Radiation Phobia"	Technical Tours CLS/SCCS/Allard-Roozen Imaging Suite (WCVM)
			COFFEE BREAK Concurrent Sessions		COFFEE BREAK Concurrent Sessions		COFFEE BREAK	
							Concurrent Sessions	
		weclome	Poster session	Industry TED talks	Poster session	Industry TED talks	Cocktails/Reception	
					Gala Dinner and Awards Ceremony; ICI Awards/ President's start at 6:00 to 10:00 PM/ cultural program			

Preliminary detailed program

Sunday July 23, 2023				
3:00 PM	Registration Open			
5:30 PM	Cocktail			
6:00 PM – 9:00 PM	Welcome Reception and social Program			
	Speakers			
	Elder or Knowledge Keeper Blessing			
	Discover Saskatoon – opening remarks			
	Government of Saskatchewan			
	Vice President Research University of Saskatchewan			
	Fedoruk Centre Executive Director			
	Monday July 24, 2023			
7:00 AM -8:00 AM	Breakfast			
8:00 AM – 10: 10 AM	Opening remarks and General Plenary (confirmed so far)			
	Jong Kyung Kim, President World Council on Isotopes			
	Pam Damoff, Member of Parliament, Government of Canada			
	Joe McBrearty, CEO Canadian Nuclear Laboratories			
	Paul Schaffer, TRIUMF			
	Syed Qaim, Advisor, Vice-Director (retired) Forschungszentrum Julich, Germany			
10:10 AM- 10:30 AM	Coffee Break			
10:30 AM-12:00 PM	Policy Perspectives Forum - Moderator Paul T. Dickman			
	Canadian Nuclear Safety Commission (CNSC)-(confirmed)			
	Atomic Energy Canada Ltd (AECL) (confirmed)			
12:00 PM -1:00 PM	Lunch			
	Concurrent Technical Sessions			
1:00 PM -1:40 PM	Reactor Produced Radioisotopes			
	Applications of Stable Isotopes			
	Isotopes in Environment			
	Applications of Isotopes in Radiation Therapy			
1:40 PM – 3:00 PM	Concurrent Technical Sessions			
	Production and supply of enriched isotopes			
	Regulatory considerations (nuclear)			
	Nuclear Data			
	Medical Imaging			
3:00 PM – 3:30 PM	Coffee Break			
3:30 PM – 4:55 PM	Concurrent sessions			
	Separation of Radioisotopes and Radiochemistry			
	Nuclear Forensics			
	Emergency and Safety			
	Theragnostic			
4:55 – 5:55	Poster Session			

Tuesday July 25, 2023			
8:00 AM – 10:10 AM	Women in Nuclear		
	Marie Curie-Harriet Brooks-Sylvia Fedoruk		
	Moderator Lisa McBride, President, Women in Nuclear, Canada		
	Keynote Speaker Melissa Denecke, Director Division Physical and Chemical Sciences,		
	International Atomic Energy Agency		
	Amy Gottschling –VP Science Technology and Commercialization, AECL		
10:10 AM- 10:30 AM	Coffee Break		
10:30 - 11:10	Nuclear physics research; Isotopes in Cosmos and Astrophysics Keynote speaker		
11:10 – 11:55	Concurrent Sessions		
	Management of radioisotope production facilities		
	Production and applications of alpha emitters		
	Radiation Metrology and Standards		
	Isotopes in Cosmos and Astrophysics		
12:00 PM -1:00 PM	Lunch		
1:00 – 3:00 PM	Canadian Strategy for Nuclear Power Deployment		
	Keynote speakers/TBD		
	Isotopes Extraction and Enrichment (Panel Discussion)		
	John Takala, Director, SHEQ, Cameco		
	TBD - ORANO		
3:00 PM – 3:30 PM	Coffee Break		
3:30 PM – 4:55 PM	Concurrent sessions		
	Isotopes of Uranium, Thorium and Radium		
	Applications of Isotopes in Veterinary Medicine		
	Public perception of Radiation and Public Engagement		
4:55 – 5:55	Poster Session		

Wednesday July 26, 2023		
8:00-10:10	Demand and Supply of Isotopes panel discussion	
	Moderator: TBD	
	Pam Damoff, MP, Government of Canada	
	Ram Mullur, VP Isotopes Business, Canadian Nuclear Laboratories	
	PALLAS High Flux Reactor, Netherlands (confirmed, TBD)	
	Ira Goldman, VP Policy and Government Relations, Lantheus	
	Jim Harvey, Northstar Medical	
	Todd Asmuth, SHINE MEDICAL	
10:10 AM- 10:30 AM	Coffee Break	
10:30-11:55	Concurrent Sessions	
	Decommissioning and decontamination	
	Radiopharmaceutical Sciences	
	Radioanalytical Methods and Instrumentation	
	Accelerator Produced Radioisotopes (linacs)	
12:00 PM -1:00 PM	Lunch	
1:00 PM – 3:00 PM	WCI Presidents' Forum	
	"Public Perception of Radiation"	
	Jon-Michael Murray, Nuclear Policy Manager, Clean Air Task Force, US,	
	Dr. Keon Wook Kang Professor and Chairman of the Nuclear Medicine Department	
	at Seoul National University Hospital	
	Professor Paul A Locke at Johns Hopkins Bloomberg School of Public Health.	
3:00 PM – 3:30 PM	Coffee Break	
3:30 -5:10	Concurrent Sessions	
	Accelerator Produced Radioisotopes	
	Regulatory Considerations (Pharma)	
	Dosimetry and NDT	
	Application of Isotopes in Agriculture and Plant Imaging	
5:30 – 10 PM	Gala Dinner	
	Thursday July 27, 2023	
8:00-10:10	Isotopes in the Environment Panel	
10:10 AM- 10:30 AM	Coffee Break	
10:30-11:55	Concurrent Sessions	
	Radioisotopes Supply	
	Other Applications of Isotopes	
12:00 PM -1:00 PM	Lunch	
1:00 – 4:30 PM	Technical tours	

BIOGRAPHIES of 11ICI Co-Chairs

TCU PLACE, SASKATOON, SASKATCHEWAN, CANADA | JULY 23-27, 2023

Bio of Dr. Lidia Matei, PhD

Corporate Business Officer, Sylvia Fedoruk Canadian Centre for Nuclear Innovation Inc.

Dr. Matei started her career in radiochemistry focusing on the production of Mo/Tc-99m generators and leading projects for GMP implementation on Na¹³¹ product lines. During her PhD studies she worked on the synthesis of labelled compounds with tritium and their application in life sciences. Dr. Matei contributed to the work focused on ^{99m}Tc production by a cyclotron (NISP Project) as a postdoctoral fellow at the University of Sherbrooke (Sherbrooke, QC). As a radiochemist at Best Theratronics (Ottawa, ON) she acquired in-depth knowledge on cyclotron sciences and targetry. Later, Dr. Matei worked on processing low specific activity linac-produced Mo-99 and she contributed to early studies for production of therapeutic isotope ⁶⁷Cu as a team member of Canadian Isotope Innovations in Saskatoon, SK. Currently she is Corporate Business Officer with Sylvia Fedoruk Canadian Centre for Nuclear Innovation Inc.



Dr. Matei has delivered many presentations at scientific conferences, and publications in peer-reviewed journals. Since 2014, Dr. Matei provides support to the European Commission as Expert Evaluator for research programs such as Eurostars, HORIZON 2020, Eureka, EURATOM and COST and is a referee for various scientific journals. Dr. Matei has served the Canadian Association of Radiopharmaceutical Scientists (CARS) since 2019, currently in the role of President-Elect.

Bio of Professor Chary Rangacharyulu, PhD

Professor Chary Rangacharyulu is a faculty member in Physics and Engineering Physics since 1983 and served as head of department for seven years (2007-2014). His research interests include:

- Nuclear and Elementary Particle Physics,
- Medical isotopes,
- Applications of Nuclear Science for Food,
- Medicine and Non-Destructive Testing (NDT) of materials,
- Conceptual Foundations of Physics and Physics Education.

During his career, Professor Rangacharyulu conducted studies in collaboration with research groups in Darmstadt (Germany), National High Energy Physics Laboratory (KEK), Tsukuba (Japan) and Osaka University (RCNP, LEPS group), Osaka, Japan, and teams of various particle accelerators and photon beam facilities in Japan and Germany.

He organized and chaired the Canada Wide Science Fair (2002), 18th International Biology Olympiad (2007), International multidisciplinary conferences of Computer Sciences, Humanities, Engineering and Sciences (2009, 2012), all held in Saskatoon. Professor Rangacharyulu authored nearly 200 research articles in international peerreviewed journals and served as a referee. Professor Rangacharyulu currently serves as the Chair of Science and Technologies of RadioIsotopes Division of Canadian Nuclear Society (CNS).



Appendix 2: BIOGRAPHIES of WCI International Advisory Committee (IAC) Members

Bio of Prof. Jong Kyung Kim

President of the World Council of Isotopes (WCI)

Jong Kyung Kim is a professor emeritus in the department of Nuclear Engineering at Hanyang University in Korea.

He had a particular responsibility for the preparation of the national promotion plan for the utilization of radiation and radioisotopes in Korea (2001-2007). He was a commissioner of the Korea Atomic Energy Commission (2010-2013). He was president of Korean Nuclear Society (KNS/ 2013-2014). He was a member of the Standing Advisory Group on Nuclear Energy (SAGNE/ 2014-2017) of the IAEA. He was the past president of Korea Atomic Energy Research Institute (KAERI/ 2014-2017). He is an executive council (EC) member (2008-2021) and vice-president for congress affairs (2016-2021) of the International Radiation Protection Association (IRPA). He is currently serving as president of the 15th International Congress of IRPA, IRPA 15.



He served on the International Monitoring and Steering Committee (IMSC) for 6ICI and the Executive Committee (EC) for 7ICI-10ICI. He is the president of WCI (2020.2-2022.6).

He has a bachelor's degree from State University of New York (SUNY) at Buffalo in nuclear engineering and a master's degree and Ph.D. (1986) in the same discipline from the University of Michigan in USA.

Bio of Mr. Paul T. Dickman

WCI President Elect Representative

Paul T. Dickman is a Senior Policy Fellow with Argonne National Laboratory, U.S. focusing on nuclear energy, non-proliferation, and national security policy. For over thirty-five years Mr. Dickman has been involved in the forefront nuclear energy and national security programs in the U.S. and internationally. He has held senior managerial positions at the U.S. Nuclear Regulatory Commission and the Department of Energy's National Nuclear Security Administration. He holds leadership positions in the American Nuclear Society and the World Council on Isotopes, advises organizations on risk communication, and serves as an advisor to the Japanese Government on the decommissioning of the Fukushima accident site.



Bio of Dr. Nigel Stevenson

WCI Immediate Past President

Dr. Nigel Stevenson is a serial entrepreneur, internationally recognized nuclear physicist, and inventor. Nigel works as the operations lead at Exubrion and brings a long history in physics, nuclear physics, and radioisotope research and development to the role. Nigel has held senior positions in several radioisotope manufacturing and research companies in addition to academic roles at National Laboratories.

He is the former Group Leader of Isotope Production Head of Applied Technology at TRIUMF, and has organized/chaired numerous national and international conferences and scientific meetings related to isotopes. Prior to Serene, Nigel was a founder/member of senior management of TcNET, LLC, Trace Life Sciences, Theragenics, and was the Chief Science Advisor of Advanced Medical Isotope Corp. Nigel is the Founding Member and past President of the World Council on Isotopes, and has held senior positions at the International Isotope Society.



Nigel has authored over 100 publications and patents. He is the Immediate Past President of the World Council on Isotopes.

Program Committee

Track Chairs

Renata Mikolajczak, (Co-Chair Track 1) Director's Plenipotentiary for Research and Scientific Cooperation at Radioisotope Centre, POLATOM, Poland (Co-Chair Track 1)

Jan Rijn Zeevaart, Principal Research Scientist, NECSA, South Africa (Co-Chair Track 1)

Marie-Claude Gregoire, Head of Directorate Isotopes & Radiobiology, Canadian Nuclear Laboratories (CNL), Canada (Co-Chair Track 2)

Svetlana Selivanova, Section Head, Radiochemistry and Medical Applications, Canadian Nuclear Laboratories (Co-Chair Track 2)

Sunil Dutt Sharma, Senior Scientist, Bhabha Atomic Research Centre (BARC), India (Chair Track 3)

Laurent Bigot, Head of Stable Isotopes Division- Orano Chemistry Enrichment (Chair Track 4)

Steven Biegalski, Chair of Nuclear and Radiological Engineering and Medical Physics Program at Georgia Institute of Technology (Chair Track 5)

Syed M. Qaim, Advisor, Vice-Director (retired) Forschungszentrum Julich, Germany (Chair Track 6)

Abstract Review Committee

Andrea Armstrong, Research Scientist, McMaster University, Canada

Laurent Bigot, Head of Stable Isotopes, Orano, France

Cristina Bolzati, Senior Researcher, Italian Nuclear Research Council, Italy

Emiliano Cazzola, Cyclotron Facility, Sacro Cuore-Don Calabria Hospital, Italy

Amares Chatt, Professor, Dalhousie University, Canada

Jose Luis Crudo, Researcher, Nanomedicine Laboratory, CNEA

Ekaterina Dadachova, Professor, University of Saskatchewan, Canada

Paul T. Dickman, Senior Policy Fellow, Argonne National Laboratory

Jin Du, Technology Officer, China Isotope & Radiation Association, China

Mark deJong, Chief Technology Officer, Canadian Isotopes Innovations, Canada

Humphrey Fonge, Radiopharmacist, Saskatchewan Health Authority, Associate Professor, University of Saskatchewan, Canada

Mitsuhiro Fukuda, Professor, Research Centre for Nuclear Physics, Osaka University, Japan

Raphael Galea, Research Officer, National Research Council, Canada

Vijay Gaja, Operations Manager, Canadian Isotope Innovations, Canada

Ira Goldman, Vice President, Global Public Policy and Government Relations, Lantheus, USA

Marie-Claude Gregoire, Director, Canadian Nuclear Laboratories, Canada **Brigitte Guerin**, Professor, Faculty of Medicine and Health Sciences, University of Sherbrooke, Canada

Justin Hicks, Assistant Professor, Western University

Matt Hutcheson, Radiation Safety Officer, University of Saskatchewan

Michael Kovacs, Director of the Lawson Cyclotron and PET Radiochemistry Facility, Lawson Health Institute, London, Canada

Amir R. Jalilian Radioisotope & Radiopharmaceutical Chemist, International Atomic Energy Agency (IAEA), Austria

Karlheinz Langanke, Research Director, Theory Division, GSI, Germany

In-Cheol Lim, Research Fellow, KAERI, Korea

Valery Radchenko, Research Scientist, TRIUMF, Canada

Caterina Ramogida, Assistant Professor, Simon Fraser University, Canada

Tom Ruth, Senior Research Scientist, Emeritus, TRIUMF

Paul Schaffer, Associate Laboratory Director, TRIUMF

Dale Schick-Martin, Facility General Manager, Saskatchewan Cyclotron Facility

Sunil Dutt Sharma, BARC, India

Svetlana Selivanova, Senior Scientist, Head, Radiochemistry and Medical Applications Section, Canadian Nuclear Laboratories (CNL), Canada

Meera Venkatesh, IAEA (retired)

Remco Zegers, Professor and Associate Director, NSCL, Michigan State University, USA **Katherine Zukotynski**, Associate Professor, Department of Medicine and Radiology, McMaster University, Canada