



11th International Conference on Isotopes (11ICI)

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Introduction

The 11th International Conference on Isotopes conference continues the multifaceted interdisciplinary exchange between the developers and producers of isotopes with applications in medicine, industry, agriculture, national security, and other fields.

Themed "*Isotopes Around Us, their Applications and Beyond*" the event will bring together members of the scientific community, producers, and processors. The scientists will have the opportunity to interact with research groups accessing capabilities established at nuclear facilities to conduct studies in nuclear imaging, diagnostics, and radiopharmaceuticals, non-destructive testing and irradiations, etc.

Selected papers will be published in a Special Issue of the Journal of Radioanalytical and Nuclear Chemistry (JRNC).

Brief description of the event

11ICI is unique from various standpoints; its tracks and sessions structures allow for open discussions about uranium extraction and exploitation. A specific session on stable isotopes will allow specialists to discuss various methods of extraction of enriched isotopes within the last decade, in parallel with the development of cyclotron technologies to produce radiometals, a new era in which targeted diagnostic and therapy began. However, the scarcity of enriched isotopes limits the capacity of development and routine production of these critically important radioisotopes. A specific session on the topic of enriched isotopes is open for discussion.

The event is structured in technical sessions categorized in eight tracks relevant for each topic as outlined below.

- I Production of Radioisotopes
- II Applications of Isotopes in Medicine and Life Sciences
- III Dosimetry, Radioisotopes Detection and Quantification
- IV Applications of Isotopes in Agriculture and Food Safety
- V Production and Applications of Stable Isotopes
- VI Isotopes Around Us
- VII Nuclear Research
- VIII Isotopes in Cosmos and Astrophysics

Your hosts

The advancement of nuclear science started in Canada at the turn of the last century when Ernest Rutherford (1871-1937) came along with Frederick Soddy (1877-1952) at McGill University in Montreal, Quebec, where he stayed for three years. Harriet Brooks (1876-1933), the first Canadian female nuclear physicist (McGill Reporter, 2011) joined him as a graduate student and followed him to England and then to Marie Curie labs. We consider her as the Marie Curie of Canada due to her distinction in radon research. Saskatchewan led the world in the development of advanced diagnostics and technologies in cancer treatment.

Located in Central Canada, Saskatchewan is the home of uranium mining, the element being extracted from wells located in the remote Athabasca basin. Saskatoon is the home base to two major uranium extraction companies (Orano and Cameco). Saskatoon is not only the place of sun and light, but it is one of the places where the history of nuclear sciences was written and continues today.

Under the leadership of Professor E. L Harrington, the first cancer control agency (Saskatchewan Cancer Commission) was established in Canada in 1930 (SCAA, unknown). Harrington started a radon plant in 1931 and brought Harold Elford Johns to Saskatchewan, who was recognized as the [driving force of \$^{60}\text{Co}\$ therapy](#) as early as 1951, helped by his students John (Jack) Cunningham and Sylvia Fedoruk. John Cunningham (1927-2020) and Harold E. Johns, contributed to the genesis of Canadian Medical Physics. Their global impact on the practice of Medical Physics can probably best be summarized by the famous textbook authored by Cunningham and Johns, entitled

The Physics of Radiology (Johns, H. E & Cunningham, J. R, 1983) — generally known as the “bible” of Medical Physics, last published in 1983

Saskatchewan’s engagement in nuclear technologies did not stop there. The Saskatchewan Accelerator Laboratory (SAL) linac facility established in 1964 on the University of Saskatchewan campus under the direction of Leon Katz (1910-2004), became an injector into a synchrotron source located at the [Canadian Light Source](#), the only one facility of its kind in Canada. More than 1,000 academic, government and industry scientists and participants from around the world use this facility every year, developing innovative solutions in health, agriculture, environment, and advanced materials.

Medical imaging and radiation therapy also evolved and the latest in Saskatchewan is the establishment of *Sylvia Fedoruk Canadian Centre for Nuclear Innovation* ([the Fedoruk Centre](#)). The Fedoruk Centre was founded in 2011, as a not-for-profit organization with the purpose of placing Saskatchewan among global leaders in nuclear research, development and training through investment in partnerships with academia and industry for maximum societal and economic benefit.

Since 2016, the Fedoruk Centre operates and manages the [Saskatchewan Centre for Nuclear Sciences \(SCCS\)](#), a state-of-the-art facility equipped with 24 MeV cyclotron (TR-24, ACSI, Canada), cGMP compliant radiopharmaceutical manufacturing spaces and radiochemistry laboratories. Both the Canadian Light Source (CLS) and SCCS are open for guests during the technical tours included in the conference program.

The Sylvia Fedoruk Canadian Centre for Nuclear Innovation Inc. (Fedoruk Centre), the University of Saskatchewan (USask) and Tourism Saskatoon have partnered to organize this conference.

11ICI Co-chairs

The 11ICI project is managed by [Professor Chary Rangacharyulu](#) at the University of Saskatchewan and [Dr. Lidia Matei](#), Corporate Business Officer at the Sylvia Canadian Centre for Nuclear Innovation as co-chairs of 11ICI.

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 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); and 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 peer-reviewed journals and served as a referee. Currently, Professor Rangacharyulu serves as the Chair of Science and Technologies of Radioisotopes Division of Canadian Nuclear Society (CNS).

Dr. Matei started her career in radiochemistry focusing on the production of Mo/Tc-99m generators and leading projects for GMP implementation on Na[I-131] product lines. During her Ph.D 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 Tc-99m production by a cyclotron as a postdoctoral fellow at the University of Sherbrooke (Sherbrooke, QC) and got in-depth knowledge on cyclotron sciences and targetry as radiochemist at Best Theratronics (Ottawa, ON). Later, Dr. Matei worked on processing low specific activity linac produced Mo-99 and she contributed to the Cu-67 project as a team member of Canadian Isotope Innovations in Saskatoon, Saskatchewan. 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 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 contributing as President-Elect.

11ICI Technical Program and Highlights

Registration will be open on Sunday June 19, 2022 at 4:00 PM. A welcome ceremony will follow starting at 6:00 PM. The preliminary program presented below is structured in plenary and technical sessions. Every day, delegates will have opportunities to hear and participate in panel discussions focused on hot topics in the industry.

Table 1 Technical program morning sessions

Monday June 20, 2022	Tuesday June 21, 2022	Wednesday June 22, 2022	Thursday June 23, 2022
General Plenaries	Marie Curie-Harriet Brooks-Sylvia Fedoruk Session Nuclear physics research; Isotopes in Cosmos and Astrophysics Plenary	Demand and Supply of Isotopes for Medicine Panel	Environmental Panel
1.1. Reactor Produced Radioisotopes	1.6. Management of radioisotope production facilities	1.7. Decommissioning and decontamination	1.8. Radioisotopes supply and demand
5.1. Production and supply of enriched isotopes	3.4. Nuclear Forensics	2.2. Radiopharmaceutical Sciences	2.5. Applications of low energy beta emitters
4.1. Applications in Soil Sciences	7.3. Instrumentation	3.2. Radioanalytical Methods and Instrumentation	4.3. Methods for plant imaging
2.6. Alpha Therapy	8.1. Isotopes in Cosmos	1.5. Public Perception of Radiation	6.3. Isotopes in Environment (2)
Policy Perspectives Panel	Canadian Strategy for Nuclear Power Deployment -SMR, Nuclear Power Plants Panel	WCI President's forum "Radiation Phobia"	Announcement of 12ICI and closing

Table 2 Technical program afternoon sessions

Monday June 20, 2022	Tuesday June 21, 2022	Wednesday June 22, 2022	Thursday June 23, 2022
5.2. Application of Stable Isotopes	Isotopes Enrichment and Separation Panels	1.2. 1 Accelerator Produced Radioisotopes	Technical Tours
3.1. Regulatory (nuclear)		2.7.Brachy/Cobalto Therapy	
7.1. Nuclear Data		3.3. Dosimetry and NDT	
2.3. Medical Imaging SPECT		6.1. Isotopes in Environment (1)	
Break			
1.4. Separation of Radioisotopes and Radiochemistry	1.3. Isotopes of U, Th and Ra	1.2. 2 Accelerator Produced Radioisotopes (II)	
2.4. Theragnostics	2.1. Regulatory (Pharma)	2.8. Application of Isotopes in Veterinary Medicine	
6.4.. Emergency and Safety	7.2. Radiation Metrology and Standards	4.2. Application of Isotopes in Agriculture	
2.3. Medical Imaging PET	8.2. Isotopes in Astrophysics	6.2. Isotopes in Archaeology, Geology and Geochemistry	
Poster Session	Poster Session	WCI Awards	
Workshop for young professionals "Radiomics"	Industry Speakers TED talks	Gala Dinner	

Plenary Speakers (confirmed so far):

Prof. Jong Kyung Kim, WCI President Hanyang University, **Joe McBrearty**, President and CEO, Canadian Nuclear Laboratories, **Dr. Paul Schaffer**, Head of Life Sciences Division, TRIUMF, Vancouver, BC, Canada, **Prof. Dr. Dr.h.c. Syed M. Qaim**, Advisor, Vice-Director (retired), Forschungszentrum Jülich, Jülich, Germany will set the tone of 11ICI during the General Plenaries session.

Dr. Melissa Denecke, Director, Division Physical & Chemical Sciences, International Atomic Energy Agency (IAEA) will open the discussions of Women in Nuclear Marie Curie - Harriet Brooks - Sylvia Fedoruk session will share her insights in a plenary talk.

Prof. Dr. Karlheinz Langanke, Director, Theory Division, GSI Helmholtz Zentrum für Schwerionenforschung, Darmstadt, Germany will highlight the role of isotopes in cosmology and astrophysics

WCI President's Forum. The invited speakers on the Forum will present and discuss the 'Radiation Phobia,' 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.

Canadian Strategy for Nuclear Power Deployment – Small Modular Reactors (SMRs), Nuclear Power Plants. Canadian specialists and policy makers will discuss strategies on generating nuclear power as a source of safe, clean, affordable energy, opening opportunities for a resilient, low carbon future.

Panel discussions

Policy Perspectives. In a panel moderated by **Paul T. Dickman**, Senior Policy Fellow, Argonne National Laboratory, Canadian policymakers will have an open discussion with their counterparts from USA, Europe, Asia, and IAEA.

Demand and supply of medical isotopes current trends and challenges Specialists will discuss current trends and challenges in supply of medical diagnostic and therapy isotopes. Invited guests are **Ram Mullur**, Vice-President, Isotopes Business, Canadian Nuclear Laboratories, **Ira Goldman**, Vice President, Global Public Policy and Government Relations, Lantheus Holdings and **Karin Stephenson**, Manager, Commercial Operations, McMaster Nuclear Reactor, McMaster University.

Environment. Specialists and members of the local authorities will listen to international insights into public's opinion on the impact of nuclear activities on the environment.

Isotopes Enrichment and Separation. Invited guests will come from Canada, USA, and other countries with activities in isotope enrichment and separation to discuss challenges and opportunities related to the use of enriched isotopes.

Canadian Nuclear Laboratories, one of Canada's leading nuclear science and technology organizations and our Conference Platinum Sponsor, will show one of the landmarks of medical isotopes production in Canada.

The **social program** focuses on Canadian culture and highlights the Indigenous Art and Culture through a dedicated program for guests to appreciate the Western Canadian hospitality and the charm of our land of living skies.

Sponsors and Exhibitors

The 11ICI provides a high-visibility platform to engage with customers and specialists from the industry. Sponsors and exhibitors have multiple options to select the sponsorship package to fit the marketing budget and feature their organization. The sponsorship and exhibitor package is available for download [here](#).

Call for Abstracts

The 11ICI Technical Program and Advisory Committee is pleased to invite authors to submit abstracts for oral, workshop, and poster presentations, to be delivered at the 11th International Conference on Isotopes (11ICI).

Abstracts must be submitted by **December 1, 2021**, and will be reviewed on a rolling basis, with notifications ending on **February 1 2022**. All abstracts **must** be prepared according to the submission guidelines and using the provided abstract template. <https://www.11ici.org/abstract-submissions>

References

McGill Reporter, (2011) "Remembering Harriet Brooks: Canada's first female nuclear physicist" retrieved from <https://reporter.mcgill.ca/womens-day-profile-remembering-harriet-brooks-canadas-first-woman-nuclear-physicist>, last accessed on September 23, 2021

Saskatchewan Council for Archives and Archivists (SCAA), *Medicare: A People's Issue 1905-1962*, from http://digital.scaa.sk.ca/gallery/medicare/en_cancer.php last accessed on September 23, 2021