

Placing Saskatchewan among Global Leaders of Nuclear Research, Development and Training

Dr. John Root

Executive Director

www.fedorukcentre.ca



What is the Fedoruk Centre?

Sylvia Fedoruk Canadian Centre for Nuclear Innovation, Inc.

- Established in 2011 under the Canada Not for Profit Corporations Act
- Independent Board of Directors (3-12 members)
- Sole Member is the University of Saskatchewan
- In FYE March 2024, funded 56% by an Agreement with Innovation Saskatchewan plus revenue from third parties for nuclear products, services and fees for Facility access

Purpose: “to place Saskatchewan among global leaders of nuclear research, development and training”

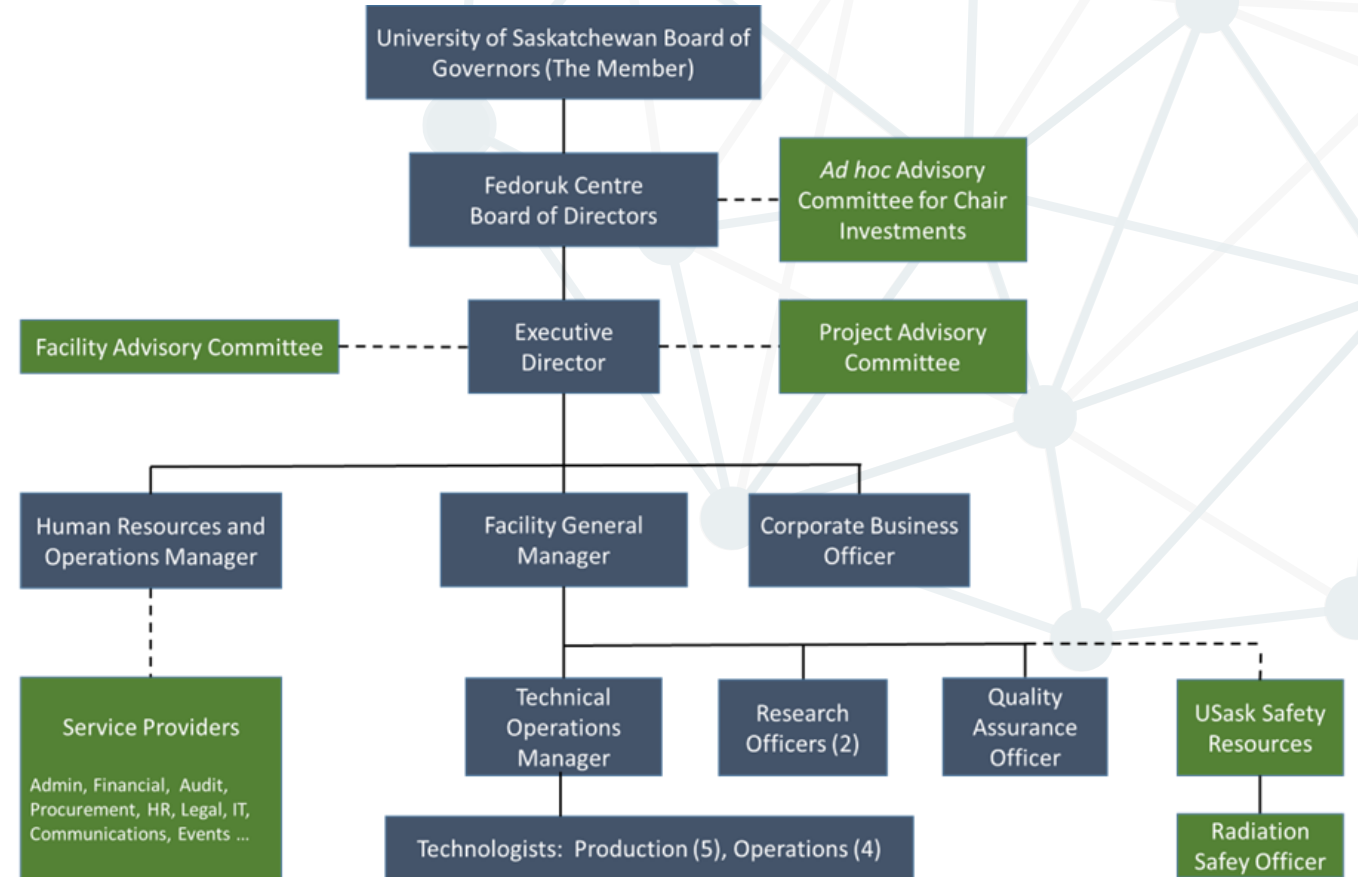


Sylvia Olga Fedoruk, OC SOM (1927 – 2012) was a Canadian medical physicist, curler and the 17th Lieutenant Governor of Saskatchewan

Fedoruk Centre Organization

Board of Directors (2024 June 25))

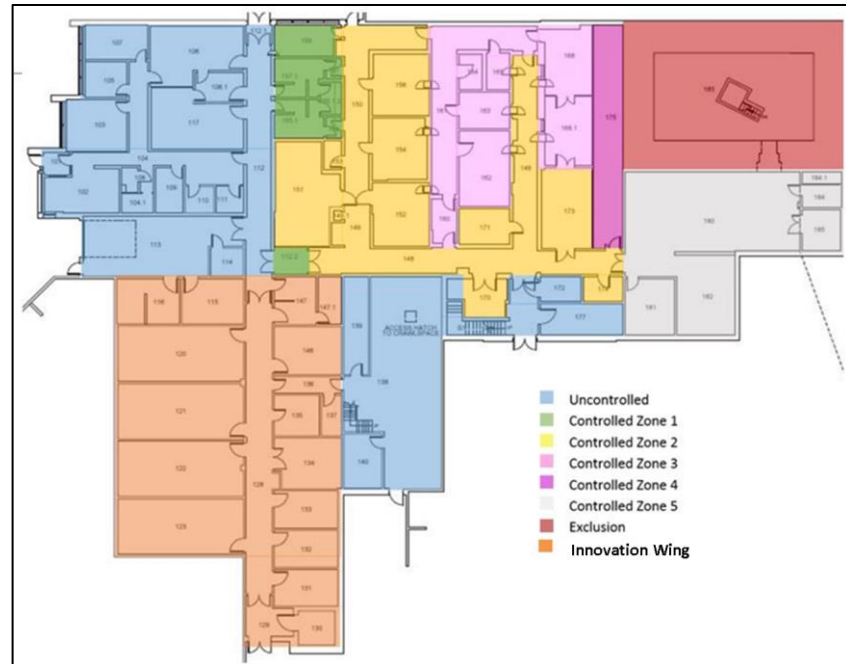
Esam Hussein, Chair of the Board	University of Regina
Katherine Zukotynski, Vice Chair	McMaster University
Deidre Henne, Board Director	University of Saskatchewan
Baljit Singh, Board Director	University of Saskatchewan
Iain Harry, Board Director	SaskPower
Avery Vold, Board Director	Innovation Saskatchewan
Tom Kishchuk, Board Director	TPK Management Consulting Inc.
Kimberlee Kearfott, Board Director	University of Michigan
Brigitte Guérin, Board Director	Université de Sherbrooke
Dawn Pratt, Board Director	Askenootow STEM Enterprise
Dan Worsley (MD), Board Director	BC Cancer Agency
Shawn Exner, Board Director	Cameco



Five Key Activities

1. Operating the Saskatchewan Cyclotron **Facility**, providing first-class nuclear tools and materials to Saskatchewan researchers to advance their programs of research and education, while also delivering radiopharmaceuticals for healthcare;
2. Investing in **Programs** with Saskatchewan institutions to add research Chairs with supporting resources to attract and develop highly qualified people in nuclear subjects;
3. Funding **Projects** to enable Saskatchewan researchers to generate innovations in nuclear technologies and provide hands-on training for students and post-docs;
4. Serving as a **Facilitator** in building research and educational capacity specifically focused on the deployment of nuclear power in Saskatchewan;
5. Providing **Consultative Services** for public and policy-makers, facilitating partnerships and developing business to strengthen Saskatchewan's presence as a leader of nuclear innovation.

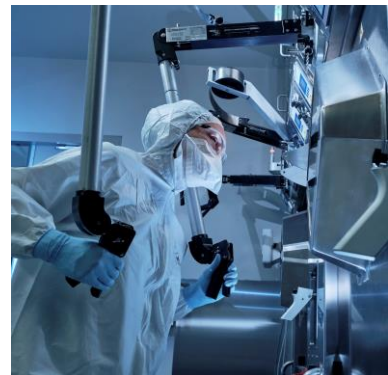
Saskatchewan Cyclotron Facility



Owned by the University of Saskatchewan

Operated by the Fedoruk Centre, in compliance with licenses from Health Canada and the Canadian Nuclear Safety Commission.

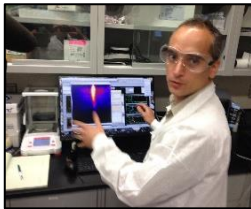
In Saskatchewan, over 3000 patients per year receive PET-CT scans to diagnose and treat cancer, with FDG from the Fedoruk Centre.



In the past 5 years, more than 100 young researchers have been introduced to nuclear innovation by Fedoruk Centre grants and access to the Saskatchewan Cyclotron Facility.

Program Partnerships with post-secondary institutions

1. Nuclear Imaging Program for life sciences (plants, animals, humans)
 - With University of Saskatchewan and University of Regina 2015-20
 - 3 “Fedoruk Chairs in Nuclear Imaging”, attracting 3 other faculty appointments at USask



Radiation Detectors



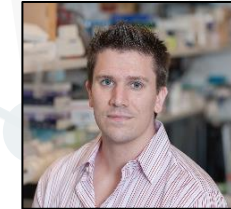
Radio-Pharmacy



Veterinary Imaging



Nuclear Medicine



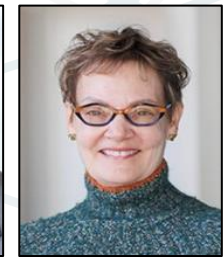
Radiochemistry



2. Policy and public engagement with nuclear science and technology
 - With Johnson Shoyama Graduate School of Public Policy 2017-21
 - Cluster of 3 Projects with existing faculty members



SMRs in the North



Deliberative Public Engagement



Major Research Facilities

3. “Fedoruk Chair in Neutron Imaging”
 - U Regina 2022-27



Neutron Imaging

Procedure to Establish a Chair

Responsibility	Action
Institutional champions	Initial discussion with Fedoruk Centre (FC) Management
FC Management	Invite a Letter of Interest from the designated host Institution
Institution	Submit Letter of Interest to the FC Board
FC Board with Funder	Stage 1 Decision: proceed to full proposal, revise concept, or decline.
Institution	Submit full proposal to the FC Board
FC Board	Strike Advisory Committee: Experts, Board members, FC Exec Director, and Funder representative
Advisory Committee	Review full proposal and advise the FC Board
FC Board	Stage 2 Decision: proceed with Chair Funding agreement
FC Management	Negotiate Chair Funding agreement (contingent on recruitment)
Institution and FC Board	Execute Chair Funding Agreement
Institution	Recruit Chairholder in consultation with FC Management and Funder

Project grants in target impact areas 2012-2022

Impact Area	Number of Grants
Understanding the practical and social aspects of nuclear energy, to inform decision-making towards a clean, sustainable future	14
Material sciences, through neutron-beam and other nuclear methods, to improve energy, health and transportation	6
Nuclear imaging tools and methods to advance life sciences, agri-biotechnologies and medicine	27

- Annual Calls for Proposals
- Annual Event to Report Progress to peers and others “NuclearFACTS”
- Total funding of Project grants 2012-2022 was \$7.5M
- Empowering Saskatchewan faculty to participate in nuclear research and training.

Part of the Foundation for SMR Deployment

Example of a **Project** led by Prof. Esam Hussein (URegina)

Researchers and students from Saskatchewan institutions apply their disciplines to understand Practical, Regulatory and Economic Viability of deploying Small Modular Reactors (SMRs) in Saskatchewan (2017 – 2020):

Safety; Environment; Treaties; Workforce; Geography; Geology; Water Resources; Transportation networks; Communication networks; Electrical grids; Respectful consultation; etc



Students and faculty researching SMR siting criteria in 2017.

Facilitator building capacity for SMR Deployment

Offering service to a company interested to build a presence and capacity in Saskatchewan to develop a highly-qualified workforce for the deployment of nuclear power... (Funder)

The Funder will provide a prioritized list of subject areas applicable to their plans for engagement with the nuclear power deployment in Saskatchewan, with examples such as but not limited to:

- Reactor technology development;
- Engineering and safety of nuclear energy systems;
- Nuclear materials research;
- Life cycle of nuclear fuel, enrichment, recycling, storage, etc.;
- Environmental impacts of nuclear technologies;
- Social sciences and economics; or
- Nuclear imaging for health and food security.

The Fedoruk Centre will

- promote the funding opportunity among SK post-secondary Institutions (USask, URegina, SaskPoly), capitalizing on province-wide coordination channels such as GIEMS;
- negotiate a Chair-Funding agreement between the Fedoruk Centre and an Institution that will host that Chair;
- manage the funding of the agreed Chair position with due diligence; and
- report progress and outcomes to the Funder.

Advisory services - Examples

Supporting university leadership of the Canadian Neutron Initiative, culminating in establishment of “Neutrons Canada” – a pan-Canadian, university-led not-for-profit corporation to govern, manage and represent Canada’s program for research with neutron beams.



Joint meeting of the CNI working group and the new Board of Directors for Neutrons Canada, 2022 Nov 30.



Partnering with USask and Discover Saskatoon to produce the 11th International Conference on Isotopes under the auspices of the World Council on Isotopes.

Attracted ~300 industry and academic participants from 20 countries to Saskatoon 2023 July 23-27

References

About the Fedoruk Centre – www.fedorukcentre.ca

Saskatchewan Cyclotron Facility Activity Report 2021-2022

https://fedorukcentre.ca/documents/resources/pubs-reports-brochures/saskatchewan-cyclotron-facility-annual-report-2021-2022_web.pdf

Nuclear Imaging Program - Achievements

<https://fedorukcentre.ca/documents/resources/pubs-reports-brochures/fedoruk-centre-achievements-nuclear-imaging-program-2020.pdf>

Partnership with the Johnson Shoyama Graduate School for Public Policy - Impacts

<https://fedorukcentre.ca/documents/resources/pubs-reports-brochures/jsjgs-csip-fedoruk-report---approved-2023-march-15.pdf>

NuclearFACTS 2024

<https://nuclearfacts.ca/>

Neutrons Canada

www.neutrons.ca