McMaster University | BRIGHTER WORLD

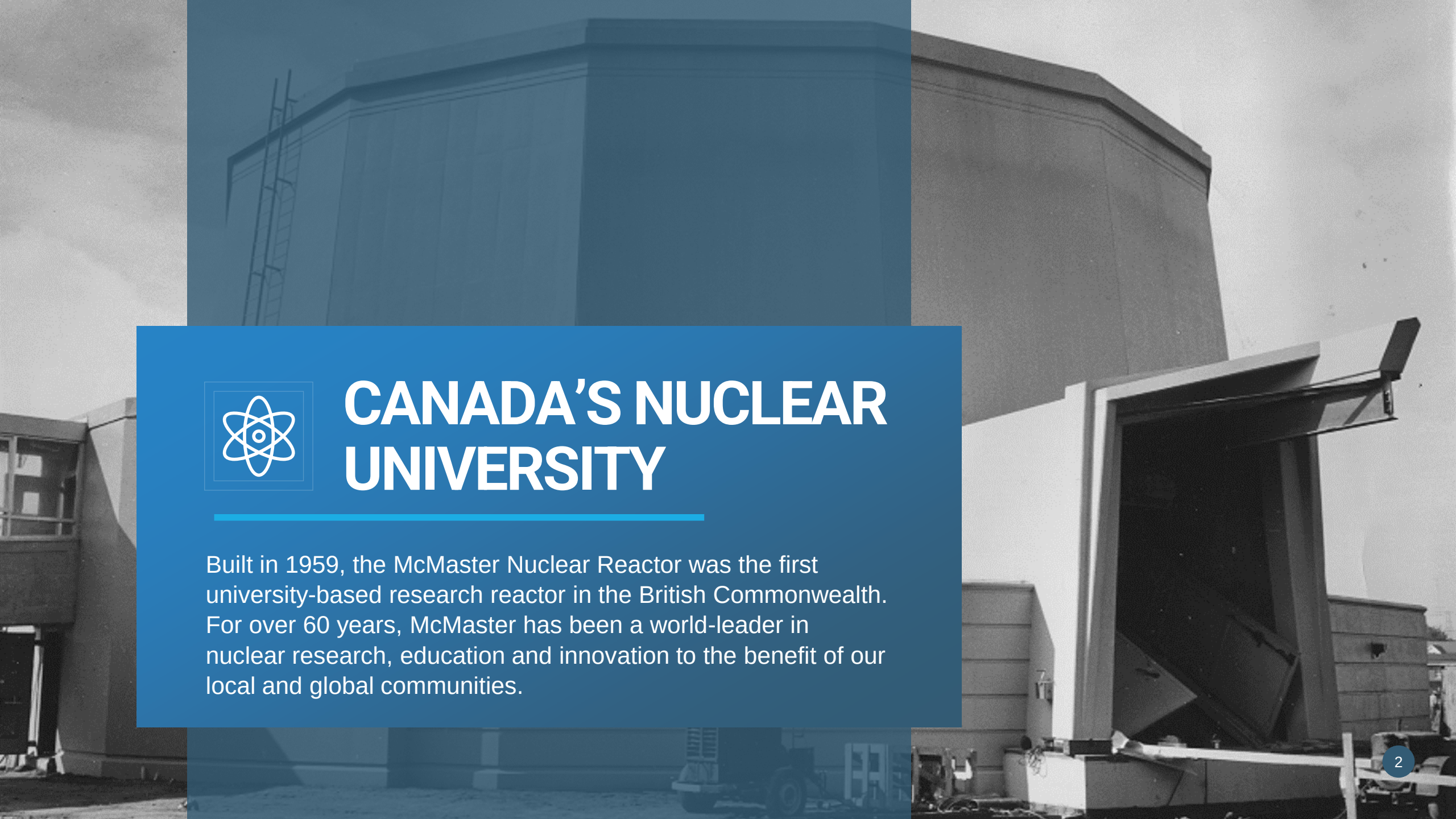
WORLD NUCLEAR ASSOCIATION

Attracting, Educating, Developing and Maintaining the Next Generation of RP Professionals

ICRP Webinar:
"Shaping the Future of Radiological Protection: Engaging the Next Generation"

2 April 2025

Josip Zic
Chief Nuclear Officer – McMaster University
Vice-Chair – WNA Radiation Protection Working Group



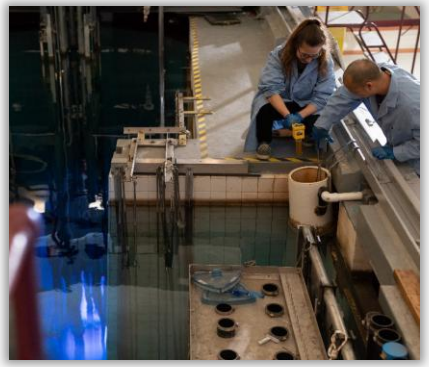
CANADA'S NUCLEAR UNIVERSITY

Built in 1959, the McMaster Nuclear Reactor was the first university-based research reactor in the British Commonwealth. For over 60 years, McMaster has been a world-leader in nuclear research, education and innovation to the benefit of our local and global communities.

WORLD-CLASS FACILITIES

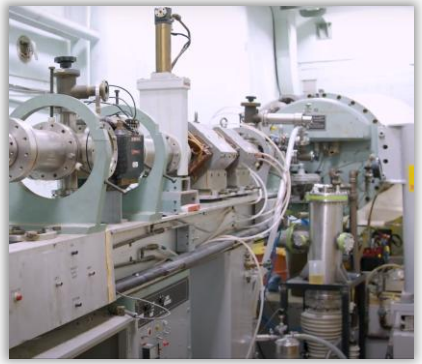
Staffed, managed and operated by **Nuclear Operations and Facilities** (NOF).

McMaster Nuclear Reactor



Centre for Advanced Nuclear Systems

McMaster Accelerator Laboratory



High Level Laboratory Facility

McMaster University Cyclotron Facility

McMaster's nuclear research facilities enable discoveries in medicine, clean energy, nuclear safety, materials and environmental science while concurrently offering the ability for hands-on teaching and learning.

NUCLEAR RESEARCH & EDUCATION

24+
Full-time professors

~20
Full-time research staff

30+
PhD students

40+
Undergraduate courses

20+
Graduate courses

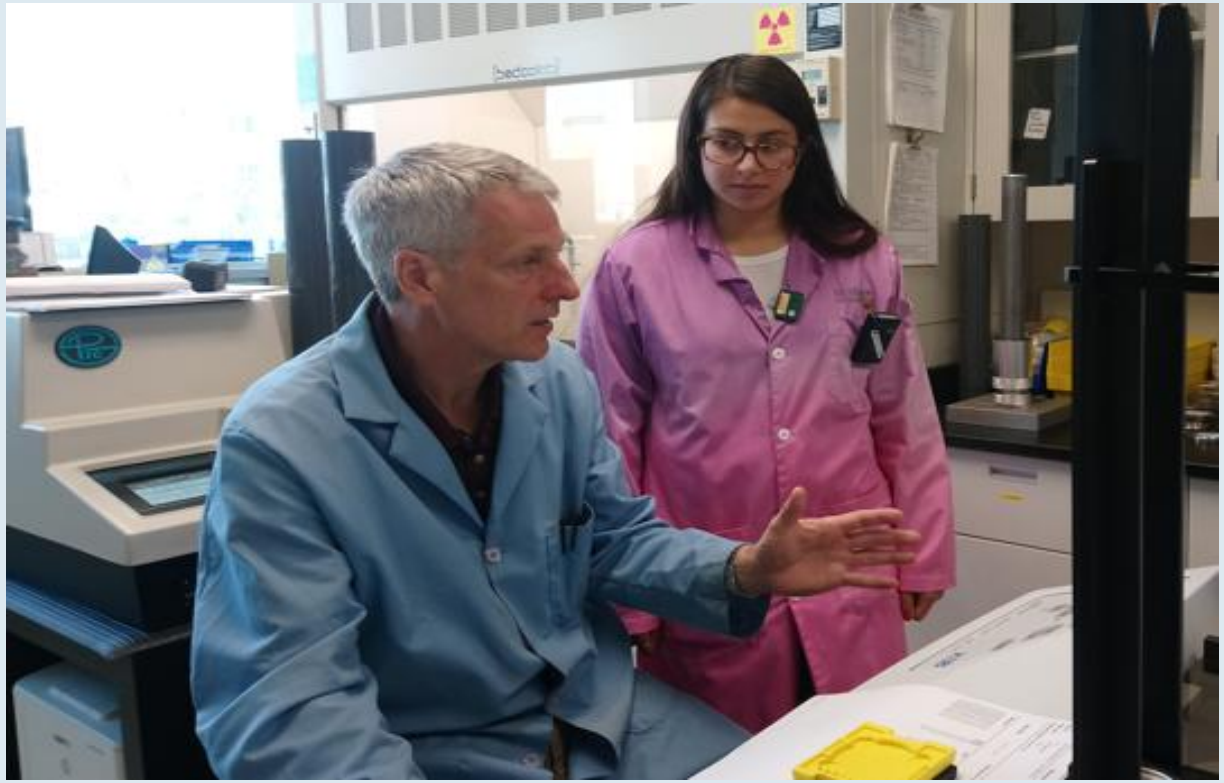
McMaster's nuclear research infrastructure facilitates **unique learning** and **work experiences** for our students.

Both **undergraduate** and **graduate** students engage in hands-on interdisciplinary research projects that compliment their in-class studies.

40+
Student job opportunities at McMaster Nuclear Facilities in 2025.

SUPPORTING THE INITIAL AND ONGOING TRAINING OF THE NEXT GENERATION OF RP PROFESSIONALS

- Outreach
- Formal Education
- Experiential Learning
- Engaging in Professional Societies
- Transfer and Continuing Education



OUTREACH PORTFOLIO

- **Reactor Tour Program**
- **Doors Open Hamilton**
- **Special events**
- **Summer Camp programs**
- **Elementary school introductory sessions**
- **High school introductory sessions and reactor facility tours**

EDUCATION PORTFOLIO

Undergraduate

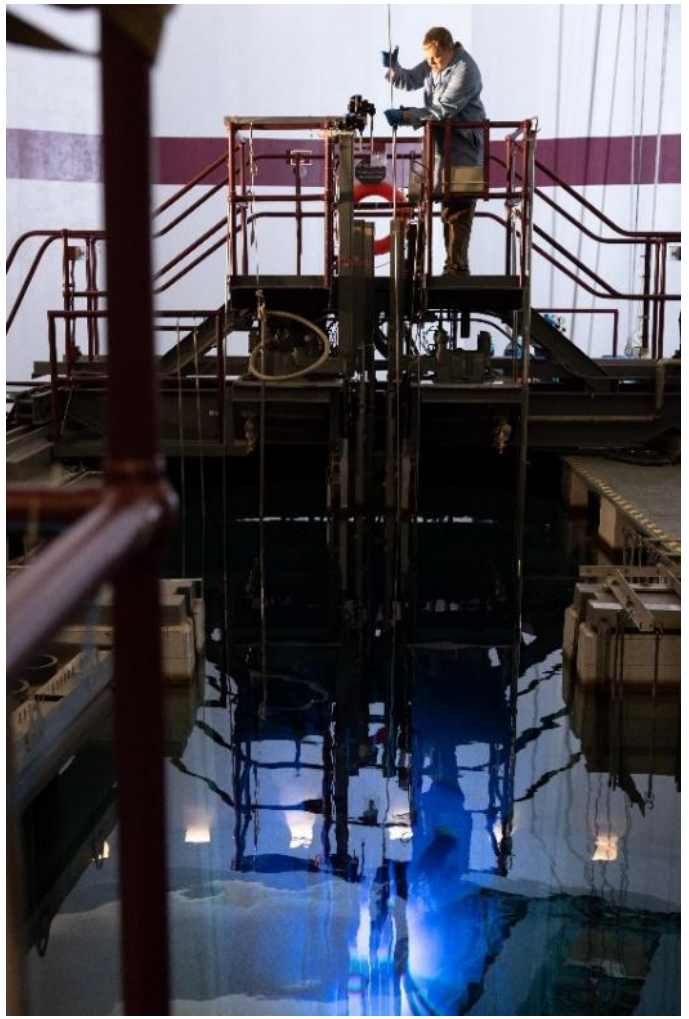
- Chemistry & Chemical Biology
- Medical & Biological Physics
- Engineering Physics, with Specialization in Nuclear Engineering and Energy Systems
- Cooperative Education Programs
- Canadian Nuclear Laboratories (CNL) Nuclear Undergraduate Research Experience

EDUCATION PORTFOLIO

Graduate

- Fusion Pharmaceuticals Training Program
- Chemistry & Chemical Biology
- CAMPEP-Accredited Medical Physics
- Radiation Biology
- Health Physics
- Engineering Physics
- UNENE Nuclear Engineering

UNENE
University Network of Excellence in Nuclear Engineering



EDUCATION PORTFOLIO

International Radiation Safety

- Collaboration with University of Alabama on Health Physics training, to combine available formal education and experiential learning available at both institutions.
- Development of International Radiation Safety Standards course.

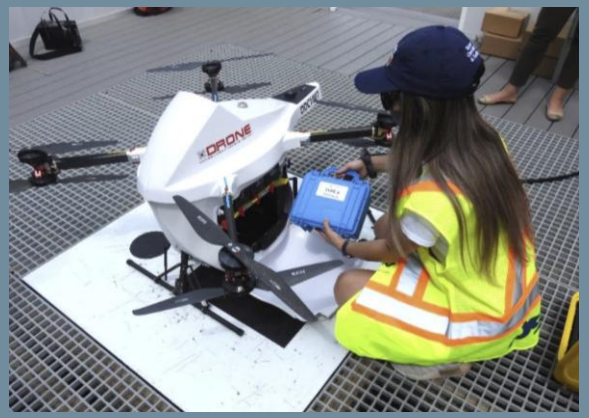
McMaster University

EXPERIENTIAL LEARNING PROVIDES UNIQUE LEARNING OPPORTUNITIES

EXAMPLE

Partnered with **DRONE DELIVERY CANADA** and partners to develop new ways to transport time-critical medical isotopes to hospitals and patients in Ontario.

Had undergraduate co-op and graduate students work on the **“Care by Air”** project, developing a Type A Package for drone Class 7 shipments.



EXPERIENTIAL LEARNING

Hands-on components **inside the McMaster Nuclear Reactor**, including:

- Demonstrating approach to criticality
- Measuring reactor reactivity
- Regulating control rod worth
- Validating simulations/models
- Neutron flux mapping
- Dosimetry calculations
- Neutron radiography
- Neutron attenuation, diffraction, and scattering

ESSENTIAL NUCLEAR TECHNIQUES

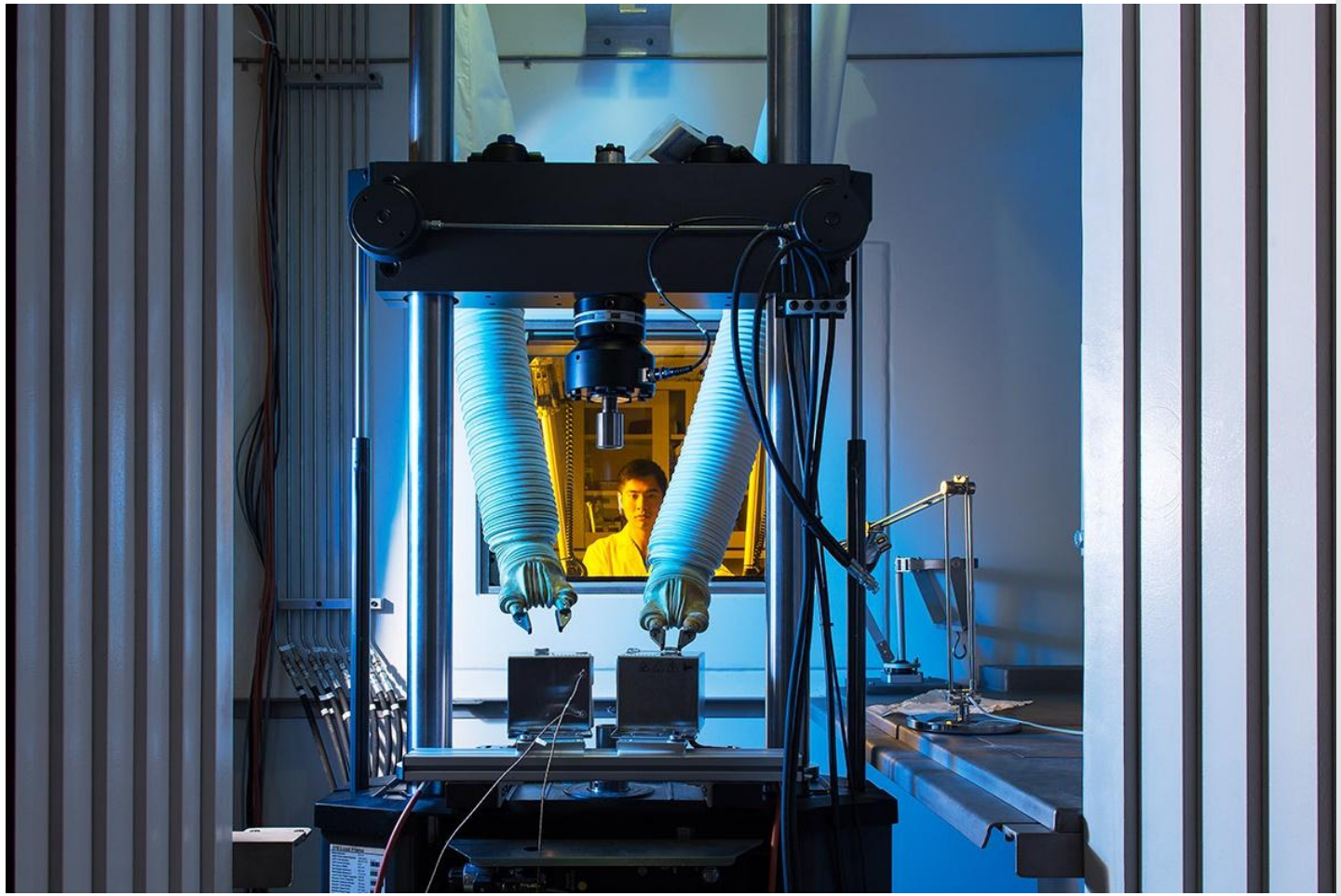
Hands-on components **inside world-class nuclear laboratories**, including:

- Neutron activation analysis
- Gamma, beta, and alpha spectroscopy
- Half-life determination
- Radiation safety and surveying principals
- Decontamination procedures
- Nuclear detection instrumentation

ADVANCED ACCELERATOR TECHNIQUES

Hands-on components **inside a wide range of particle accelerators**, including:

- Cyclotron and accelerator operations
- Target fabrication and processing
- Hot cell chemical processing
- Hot cell manipulator operations



CURATED TO MEET LEARNING OBJECTIVES

McMaster hosted the **Small Modular Reactors (SMR) Applications** workshop, an international program for graduate students across the world. Programming included:

- 5 weeks of virtual lectures from global experts
- 1 in-person week at McMaster University
- SMR deployment-focused group project

Key international partnerships and sponsorships to ensure fulsome programming:

NEA Nuclear Energy Agency

OECD BETTER POLICIES FOR BETTER LIVES

Canadian Nuclear Laboratories
Laboratoires Nucléaires Canadiens

ENGAGING IN PROFESSIONAL SOCIETIES

- Support reduced student membership in Radiation Professional Societies.
- Educate students and professionals on the importance of getting involved in professional radiation safety societies.
  - Provide and fund opportunities for students to be involved in and present at radiation safety conferences
- Act as an examination site for professional designations:
  - Canadian Radiation Protection Association
  - American Board of Health Physics

AAHP

IRPA

WORLD NUCLEAR ASSOCIATION

Radiological Protection Working Group

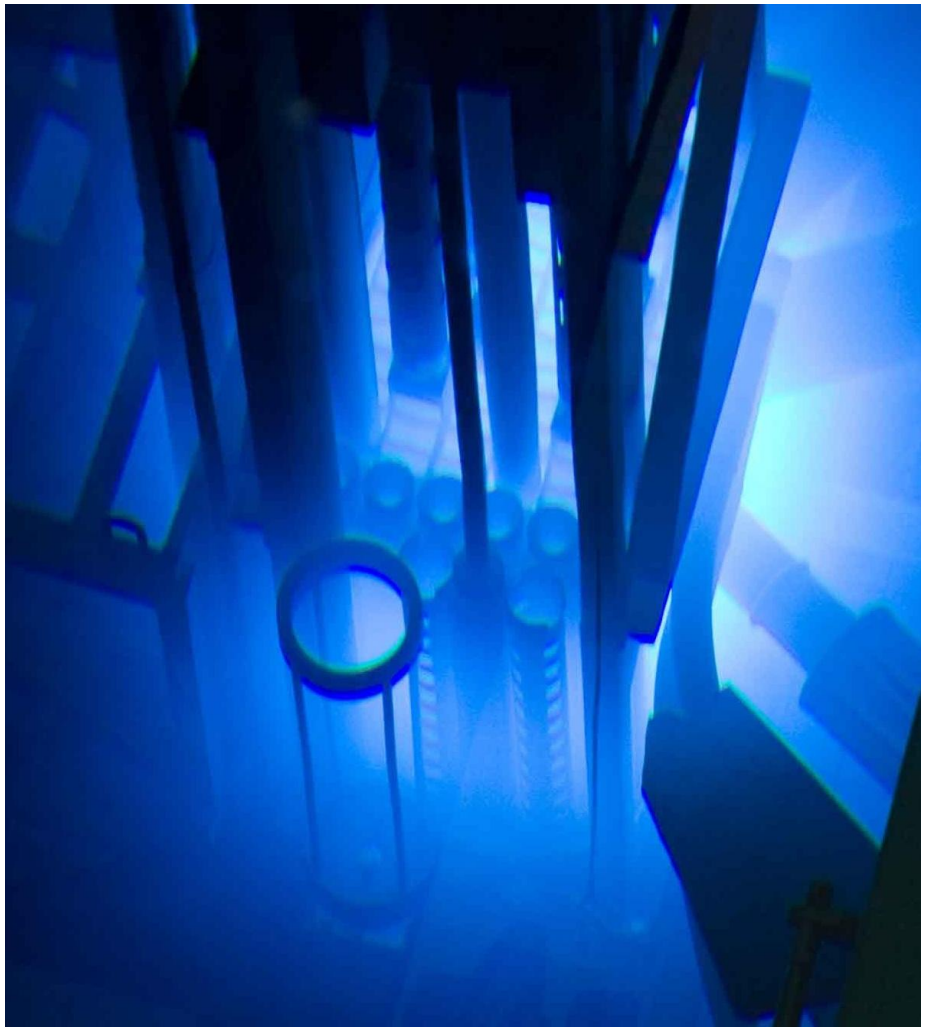
Expertise in the practical application of radiological protection in the nuclear industry

World Nuclear Association – Radiation Protection Working Group (RPWG)

The Group advocates scientifically-based policies and practices supported by industry experience to provide sufficient protection to the worker, public and the environment. It channels the global industry's voice on radiological protection (RP) questions, as it interfaces with institutions, such as the International Commission on Radiological Protection (ICRP) and the International Atomic Energy Agency's (IAEA) Radiation Safety Standards Committee (RASSC).

RPWG STRATEGIC PLAN FOCUS AREA: Engaging the Next Generation of Radiation Protection Professionals.

TRANSFER & CONTINUING EDUCATION



McMaster's **Health Physics Micro-Credentials** program is currently in development, undergoing academic approval. Aiming to launch in September 2025.

Provides opportunities to have working professionals obtain Health Physics training to either enter the field of Radiation Safety or enhance their current skills.

WORLD NUCLEAR UNIVERSITY – SUMMER INSTITUTE

- The Summer Institute is a full-time, immersive professional development programme designed to develop key leadership and communications capabilities, further holistic industry knowledge, and develop innovative and systemic thinking.
- Includes sessions on radiation safety fundamentals, how to put radiation safety into practice and breakout sessions for teams to tackle radiation safety challenges.

Josip Zic
Chief Nuclear Officer
zicjj@mcmaster.ca

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