



Jewish General Hospital  
Lady Davis Institute for Medical Research



## **“Identifying traces of nuclear events: Developing the next generation of radiation detection systems for environmental nuclear forensics”**

**Pawel Mekarski, PhD**

Head, Radon Technical Operations Section  
Radiation Protection Bureau  
Health Canada

### **Abstract**

Supporting Canada’s obligations under the Comprehensive Nuclear-Test-Ban Treaty, Health Canada performs environmental monitoring for traces of radioactivity that may be indicative of illicit nuclear activities. This is accomplished using a well-established network of monitoring stations across Canada, where atmospheric samples are taken – and subsequently measured – with radiation detectors as part of a larger global framework.

Specialized laboratories support these stations, where more advanced detection equipment improves upon the original measurements taken at the sampling locations. However, it remains challenging to separate the radioactive isotopes that are indicative of nuclear events from the radiation that is naturally present in a laboratory environment. To this end, Health Canada has been developing more complex systems composed of multiple radiation detectors that can measure the smallest traces of radioactivity.

This seminar will summarize the global nuclear monitoring landscape and detail the advancements in low-level radiation detection that Health Canada has achieved to date through its research program. As part of a larger Canadian initiative, these advances are being incorporated into the next generation of detection systems that seek to reach the fundamental limits of detection. The measurements of these miniscule amounts of radioactivity provide crucial information that ultimately allows us to determine the nature of any nuclear events taking place in our world.