

# **ICRM - Low-Level Radioactivity Measurement Techniques (LLRMT) 2016**

**Monday 26 September 2016 - Friday 30 September 2016**

## **Conference Scientific Programme**

The measurement of low-levels of radioactivity in a variety of settings is of tremendous importance to scientists seeking to solve today's mysteries and challenges. The Low-Level-Radioactivity Measurement Techniques (LLRMT) conference, held every four years, is endorsed by the International Committee for Radionuclide Metrology (ICRM) and brings together scientists from all over the world to work on such topics as the development of low-background techniques, environmental monitoring, environmental science, treaty verification, and much more. The focus is on quantifying low-level radionuclide signatures in the environment, and national metrology labs from around the world are particularly well represented. Topics include, but are not limited to **low-level aspects**\* of the following: \*Low-level radioactivity measurements generally deals with measurements of activity at Bq, or rather mBq-levels, or with techniques to pre-concentrate radionuclides such that extremely small concentrations (e.g. microBq/kg or lower) can be measured.

## Radiochemical Techniques

Fission Products, Actinides, Activation Products, Long-Lived Radionuclides, Rapid Methods

## Applications

NORM, Decommissioning, Bioassay, Food Safety, Safeguards, Remediation, Emergency Response, Nuclear Forensics, Waste Management, Support Measurements for Astroparticle Physics, etc.

## Radiometrics

$\alpha$ -Particle Spectrometry, Liquid Scintillation Counting, 'Conventional' and Ultra-Low-Level  $\gamma$ -Ray Spectrometry, Other Radiometric Techniques

## Non-radiometric Measurements

Mass Spectrometry - ICP, Thermal Ionization, Accelerator Based, Neutron Activation

## Radioactive Noble Gases

Including the decay products of radon isotopes

## Quality

Traceability, Reference Materials, Proficiency Tests, Intercomparisons, Quality Assurance

## Special Topic: Metrology of NORM

Recognition of human exposure risks from Naturally-Occurring Radioactive Material (NORM) and Technologically-Enhanced NORM (TENORM) has been increasing for decades. This has led to new regulations around NORM and new challenges for NORM metrology. In this session we will

examine low-level methods for quantifying NORM, development of CRM for NORM, and the quantification of disequilibrium from industrial processes giving rise to TENORM. We invite submissions on these topics, especially those relating to metrology challenges driven by new regulations.

## **Special Topic: Monitoring Networks**

Today a wide range of sensor networks for monitoring radiation have been realized. For this special session we focus on three monitoring network themes: radiation safety monitoring networks; radiation portal monitors, for example at border crossings to prevent nuclear smuggling; and international networks for verification of nuclear treaties, for example the International Monitoring System (IMS) which supports the Comprehensive Nuclear-Test-Ban Treaty. The metrology challenges for these monitoring networks are diverse. Treaty verification can require calibration standards and CRM at low levels and with short-half-life isotopes. Radiation safety monitoring can require interpreting signals from multiple sensors to provide low detection limits without excessive false positive detections. Monitoring border crossings can require discrimination of NORM or medical isotopes from anthropogenic nuclear material of concern at low levels of observed activity. Similarly, specific CRM and proficiency tests are required by analytical networks, for example the IAEA's Analytical Network for the Measurement of Environmental Radioactivity (ALMERA), to support timely and reliable data reporting in emergency situations. We invite submissions around these four monitoring network themes addressing contemporary challenges with low-level CRM and calibration standards, interpretation of monitoring network signals, and discrimination of NORM from signals of interest at low levels. Note, however, that papers dealing solely with dosimetry are outside the scope of this conference.