Nuclear Forensics at Argonne National Laboratory

Nuclear Forensics is a relatively new field that seeks to determine nuclear, radiological, and chemical signatures that can be used to trace the origins of materials employed in an improvised nuclear device (IND) or a radiological dispersal device (RDD). Argonne National Laboratory is considered one of the world’s experts in sealed source signatures as well as in age-dating radiological sources that might be used in an RDD. Currently, our department has several tasks funded for pre- and post-detonation nuclear forensics. Today’s seminar will focus on a few of those tasks. These include Argonne’s methodology for high precision isotope ratio measurements by Inductively Coupled Plasma Quadrupole Mass Spectrometry (ICP-QMS), Argonne’s handheld XRF analyzer for pre-screening and prioritizing IAEA swipes, and use of a scanning probe microscope for characterizing uranium and plutonium morphology.