

## CTBTO Science and Technology Conference Vienna, Austria, 24 June – 28 June 2019

The Comprehensive Nuclear-Test-Ban Treaty (CTBT) bans nuclear explosions by everyone, everywhere: on the Earth's surface, in the atmosphere, underwater and underground. The Treaty has a unique and comprehensive verification regime to make sure that no nuclear explosion goes undetected. The International Monitoring System (IMS) will, when complete, consist of seismic, hydroacoustic, infrasound and radionuclide facilities worldwide to monitor the planet for signs of nuclear explosions. *Alik Ismail-Zadeh attended the 2019 CTBTO Science and Technology (S&T) Conference. Also he met Dr. Lassina Zerbo, CTBTO Executive Director, and Dr. N. Meral Özel, International Monitoring System Director to discuss possibilities to strengthen a cooperation between IUGG and CTBTO.*

The CTBTO S&T Conference took place at Hofburg Palace in Vienna from 24 to 28 June 2019. The Conference attracted more about 1,500 participants and over 700 submitted abstracts. I was co-organizer and chair of two sessions at the S&T Conference 2019:

- A. Knowledge of the Geosphere Structure and Dynamics
- B. Solid Earth Structure



The sessions focused on the dynamic properties and processes of the earth whose characterization is necessary for the optimum processing, interpretation, and assessment of monitoring data.

Scientific and technical advances in monitoring the globe for nuclear explosions require an understanding of the way in which features of the Earth influence relevant signals as they travel from their point of origin to points where signals are observed. The signals from monitoring networks, as well as noise recorded by those networks, constitute a massive dataset that can support advances in the geosciences on a global, regional, and local scale. Elements of the monitoring effort also need to be able to consider the complexities of the earth as a social system, specifically the interference between anthropogenic aspects and the Earth's system processes, as they are connected and may interact with each other.

One focus continues to be seismic wave speed and attenuation, which are essential for locating seismic disturbances in the Earth. Yet another area is subsurface properties relevant to the detection of a nuclear explosion by geophysical, radionuclide or other methods during an on-site inspection. However, relevant characteristics of the Earth are not limited to those required for supporting current monitoring technologies. Novel methods of monitoring, including those using satellites or other remote sensing methods, also require characterization of specific properties of the earth's subsystems.