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International Henry Moseley School and Workshop on X-ray Science

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International Henry Moseley School and Workshop on X-ray Science

Under the glowing southern Turkish sun, a group of 54 students from eight different countries and 18 teachers from all over the world gathered for 10 days to learn about and discuss the latest developments in the applications of X-rays in different branches of science. The International Henry Moseley School and Workshop on X-ray Science was held at the Institute of Theoretical and Applied Physics in Turunç, Turkey, from June 14 to 23, 2012.

This is the first X-ray School dedicated to famous X-ray physicist Henry Moseley (1888–1915), who discovered and explained the X-ray spectra of elements, and through this process established X-ray spectroscopy as an invaluable tool for basic science. Moseley tragically died and is buried on Turkish soil after losing his life in the Gallipoli War. This workshop was a poignant reminder of the power of science in forming bridges.

The Henry Moseley School was organized by the Institute of Theoretical and Applied Physics' Turunç-Marmaris campus. Ercan Alp of Argonne National Laboratory chaired the meeting.

The memorial session, dedicated to the life and science of Moseley, featured three speakers, Michael Hart (Manchester), Miral Dizdaroğlu (NIST), and Emin Özel (METU). They recounted the last days of Moseley in the war, as well as his numerous scientific accomplishments, including the prediction of new elements, establishment of an atomic model through X-ray spectra alone, and correct identification of the Lanthanide series of elements for the first time.

The rest of the scientific program included three-hour lectures by each speaker, delivered on two consecutive days. Gopal Shenoy (Argonne) introduced the basic aspects of synchrotron radiation, and gave a detailed account of properties of storage rings and free electron lasers. Steve Heald (Argonne) discussed X-ray absorption spectroscopy, data analysis, and its applications. Barbara Lavina (UNLV) and Robert vonDreele (Argonne) discussed the principles of single crystal and powder diffraction methods, respectively. Ralf Röhlsberger (DESY) presented the principles of nuclear resonant scattering, and its applications to thin film magnetism and spintronics materials.

After a day-long excursion trip on a big boat to various bays and caves in the area surrounding Turunç and swimming in the blue waters of the Mediterranean, the participants were in the mood for more X-ray science.

Samuel Webb (SSRL) presented geological and soil science applications of the X-ray microprobe. Jitka Eryılmaz (SANKO-Turkey) introduced the structural characterization of complex macromolecules by X-ray crystallography, while Zehra Sayers (Sabancı University, Turkey) discussed small-angle X-ray scattering and its applications in biology. She also informed participants about the SESAME project in Jordan. Ian McNulty (Argonne) gave the first presentation on X-ray imaging, and explained various contrast mechanisms, a talk that was complemented by Peter Cloetens (ESRF) on the use of coherence for imaging. Simo Huotari (University of Helsinki) presented the latest developments in X-ray Raman Scattering and Imaging, which is sensitive to chemical bonds. The versatility of X-rays was further demonstrated by Pulak Dutta (Northwestern University) in applications for the study of liquid surfaces. Numan Akdoğan (Gebze Institute of Technology, Turkey) presented an overall view of how X-rays are utilized in materials science. Özgür Çobanoğlu (SANKO-Turkey) discussed the principles and practical aspects of X-ray detectors, and Ercan Alp (Argonne) presented the basic features of inelastic X-ray scattering. He has also discussed plans for the Turkish Accelerator Center on behalf of Ömer Yavaş (Ankara University, Turkey).

Participants at the first International Henry Moseley School and Workshop on X-ray Science.

Students presenting a special gift to Gopal Shenoy (Argonne), a miniature sculpture of Hodja Nasreddin, after reciting several of his jokes, which are very much part of Turkish culture.

Students attended the Moseley School from 28 different scientific institutions and research centers, and from very diverse fields like geology, archeology, chemistry, physics, material science, and forensic science, to name a few.

The school was sponsored by ITAP (Institute for Theoretical and Applied Physics), TUBITAK (Turkish Scientific and Technical Research Organization), TAC (Turkish Accelerator Center project), TKD (Turkish Crystallography Association), Argonne National Laboratory, and SANKO Co.

The Moseley School demonstrated the need for X-ray science in different branches of science, and the difficulty of organizing regular university lectures in advanced topics because of the lack of critical mass at a given time in one university. The Moseley School will be held annually. ■

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Still to come in 2013

26.3 Novel Modes of Accelerator Operations

26.4 Synchrotron Radiation in Asia

26.5 Advances in Metrology

26.6 Magnetic Materials Probed with Polarized X-rays