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2nd OpenLab Turkey 2018 – Follow-up of IYCr2014

A 2nd OpenLab was organized in Turkey on 10-13th September 2018 as follow-up of the educational initiatives taken place during the International Year of Crystallography in 2014, in collaboration with UNESCO and IUCr. Like for the 1st OpenLab (Ankara, 19th-22nd January 2015), this event was also held in the campus of the Bilkent University in Ankara, at the National Nanotechnology Research Center (UNAM). The OpenLab logistics and organization was taken care by the University of Bilkent and UNAM (Enver Kahveci) and the Turkish Crystallographic Association (Prof. Betül Kaynak and Prof. Suheyla Ozbey, from Hacettepe University, Ankara), with the support of IUCr, the University of Padova (Italy), Malvern Panalytical B.V. (The Netherlands), Atomika Teknik (Turkey) and UNAM (Turkey).



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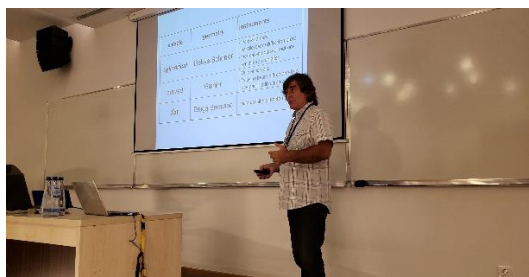
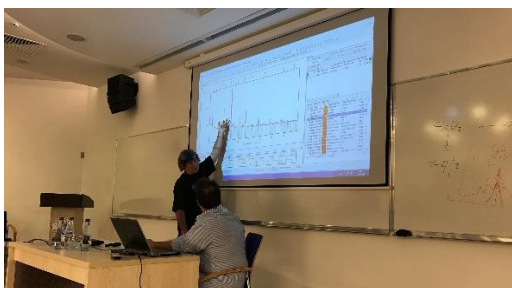


The program of the OpenLab was starting from a broad introduction to the basics of crystallography, and then focusing on the theory and the practice of powder diffraction, and on specific applications which are relevant for industries such as in the mining and building materials fields.

The scientific lectures during the four days of the OpenLab were delivered by Prof. Gilberto Artioli and Prof. Maurizio Bellotto (University of Padova, Italy). They included basics of crystallography and diffraction, the experimental geometries for powder diffraction, data interpretation (including phase identification, quantitative phase analysis, available software, and databases) and introduction to full profile refinement. Practicals of Rietveld refinement on several examples were carried out, also including refinement of the data from the IUCr CPD Round Robin on Quantitative Phase Analysis (<http://www.iucr.org/resources/commissions/powder-diffraction/projects/qarr/data>).

Dr. Marco Sommariva (Malvern Panalytical B.V.) explained the important aspects of a good sample preparation for powder diffraction experiments, and he then covered the details of instrumental components. Thanks to the Malvern Panalytical powder diffractometer installed at UNAM, the 30 attendees had the chance to participate in a half-day hands-on session focused on sample preparation and good practices for data collection and interpretation (by Enver Kahveci from UNAM, and Enver Can Kilic from Atomika Teknik).

Free-ware software and databases, such as GSAS and the C.O.D., respectively, were shown and used in depth in order to direct the attendees towards independent crystallographic activities. A trial version of HighScore Plus software was also used and introduced as an example of a commercial program for the analysis of powder diffraction data.



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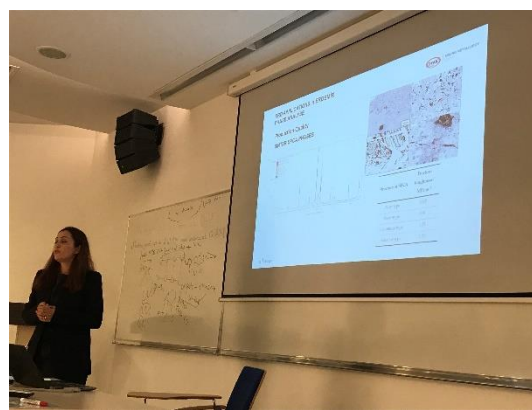
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All the attendees showed a very active participation and a curious and motivated behavior during the various sessions, with intensive discussions during the coffee-breaks as well. A few advanced applications were also shown by Prof. Artioli and Bellotto, with focus on materials science and industry. The session on industrial applications of XRD in program on the last day was integrated by a lecture on the advanced methods for characterization of metallic glasses (Dr. E. Kalay, from Middle East Technical University, Ankara), and another presentation on the use of the XRD technique for the steel industry (Dr. S. Daldal Akın, from Erdemir). The afternoon of the last day was devoted to the visit of the splendid Museum of Anatolian Civilizations in the Ankara old city center.



The participants were mainly from Turkey and were selected from a large number of applications, witnessing the high interest for the event. A short survey at the beginning of the event revealed that the group was mostly composed by people with academic background including several PhD students, except a few coming from the industry. All participants who successfully completed the lectures received a certificate of attendance.



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At the end of the event, the participants were also requested to fill-in an evaluation questionnaire, from which it resulted that the general satisfaction and the satisfaction on theoretical and hands-on sessions were rated as 4.5 (in a scale 1 to 5, where 1 = not satisfied, and 5 = fully satisfied), with the main remark being the too short time reserved for the event (four days). The questionnaire included also questions about the preferred topics for possible future events, and the results showed that 30% of the preferences are for a future course on Advanced Powder Diffraction, 28% of the preferences are for a training on characterization of thin films (namely grazing incidence XRD and reflectivity), 22% for a course on texture analysis and residual stress, 15% for a workshop on Small-Angle X-ray Scattering, 2% for other topics (Selected Area electron diffraction and X-ray tomography).

The general impression is that the spirit and aims of IYCr2014 were conveyed, and that great interest has been aroused for future schools and workshops.

There is a strong desire to consider the OpenLab as the start of a regular and sustainable school for the Turkish (and not only) crystallographic community.

Padova–Almelo, 14th September 2018



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