SIG No: 4
Reported Period: 2015-2016
Report Date: 31.07.2016
Reported by: Mauro GEMMI
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1. Introduction. (50 words max.)
The aim of SIG#4 is to raise the awareness and acceptance of Electron Crystallography to a rank comparable to X-ray crystallography. Last achievements of the community are: new methods of data collection, methods for crystal structure refinements with electron diffraction data and the application of electron diffraction tomography to protein crystallography.

2. SIG web site:
SIG 4 url: http://sig4.ecanews.org/

3. Number of ECA individual members registered with the SIG according to (http://www.xray.cz/eca/im-payment.htm)
SIG 4 electron crystallography 117

4. Existence of a SIG mailing list X Yes / O No
Address of the mailing list: ecaelectronsig@iucr.org
Number of members in the SIG mailing list : 45

5. Approximate total number of researchers involved in the SIG (please indicate the basis for the estimate)
45 researchers (mailing list)

6. List of MS organized by the SIG at the last ECM

MS23	Nanoscale structures
MS27	Electron crystallography methods

7. Prizes sponsored/coordinated

8. Past Activities other than Microsymposia at ECM

Organization of the **Microsymposium IM6-I on quantitative diffraction** at the **EMC 2016** , The 16th European Microscopy Congress 28 Aug- 2 Sept Lyon France, by ECA Individual Members registered with the SIG.

Title: **27th Ad Hoc Workshop on Jana2006 - Electron diffraction** 15.-16. October 2015, Prague, Czech Republic.
Number of participants: 18

- SIG members involved in the organization

Description: A two-days workshop focused on all aspects of structure analysis of nanocrystals from electron diffraction data using the crystallographic computing system Jana2006. The program covered data processing, structure solution, kinematical and dynamical structure refinement.

Title: **Phase and Orientation mapping at nm scale: ASTAR Advanced users workshop** October 27-29 2015. Université de Grenoble, SIMAP**,** Grenoble, France.

Number of Participants: 15

- ECA Individual Members registered with the SIG involved in the organizing committee
- ECA Individual Members registered with the SIG involved as lecturers

Two days workshop for users of ASTAR (Orientation and Phase mapping at nm scale in TEM) was organized by NanoMEGAS SPRL, Belgium in Grenoble. The workshop consisted of demonstration of data collection in TEM, hands on practice with the user data. During the workshop new features (eg. Solving the 180° orientation ambiguity related to spot diffraction patterns in Transmission Electron Microscopy) of phase and orientation mapping software were also demonstrated to the participants by Dr. Edgar Rauch.

Title: **Microscopy of materials** 18.-22.April 2016, Prague, Czech Republic.

Number of participants: 21

- SIG members involved in the organization

Description: Five-days long school covering basics of scanning and transmission electron microscopy for material scientists. The school was composed of theoretical lectures as well as practical works on sample preparation, high-resolution TEM, indexing of powder and single-crystal diffraction pattern.

Title: **International School on Fundamental Crystallography with applications to Electron Crystallography** (1 week school, 27 june – 2 July 2016, at University of Antwerp)

Number of participants: 41 (38 students, 3 lecturers)

- ECA Individual Members registered with the SIG involved in the organizing committee
- ECA Individual Members registered with the SIG involved as lecturers
- Sponsored by ECA with a 1000 euros for travel grants for the students

Description: the school intended to give the participants a basic knowledge in crystallography, as well as how to use it in the context of a transmission electron microscope. The intended audience were those working with a TEM or collaborating with TEM groups wishing to have a better understanding of their results. Too often TEM-operators lack the background knowledge in crystallography that is necessary to get the most out of their results or to avoid making mistakes against basic crystallography. The skills to take beautiful images and high resolution composition maps cannot be fully exploited if the basic knowledge of electron diffraction and the relations between direct and reciprocal space are not understood. The International School on Fundamental Crystallography with applications to Electron Crystallography seeks to remedy these knowledge gaps.
The school focussed on basic knowledge of electron diffraction patterns (SAED, CBED, PED, EDT, MD) and the crystallographic information that could be obtained from such patterns. The first three days of the school were about basic crystallography, the last three days were about electron crystallography.

Title: **ED-XPD Workshop - Combining Electron and X-ray Powder Diffraction Techniques for Structural Characterization**, June 6-10 2016, Stockholm, Sweden

Number of participants: 52

- ECA Individual Members registered with the SIG involved in the organizing committee
- ECA Individual Members registered with the SIG involved as lecturers

Description : the workshop was held at Stockholm University and organized by Lynne McCukser, Wei Wan and Xiaodong Zou. The purpose was to combine electron diffraction and X-ray powder diffraction to characterize the structures of polycrystalline materials. It includes lectures followed by practical sessions. 51 people from 14 countries, including 5 lecturers and 9 assistants participated in the workshop.

9. Future/Programmed Activities.

Title: **CryoEM school**, September 2017 Pavia, Italy

- ECA Individual Members registered with the SIG involved in the organizing committee
- ECA Individual Members registered with the SIG involved as lecturers

The Italian Crystallography Association, is planning to organize an international school on cryoEM both in imaging and diffraction, focused on structure determination of proteins.

10. Other matters. (50 words max.)

11. Brief annual activity report (100 words max.)

SIG#4 is always very active in organizing school to teach young crystallographers about the most recent developments of electron diffraction methods. We participated in the organization of microsymposia at ECM2016 in Lyon France, and at ECM30 in Basel, Swiss, in 2016. We are especially interested in interdisciplinary microsymposia in order to disseminate knowledge of electron crystallography to other communities. Several schools that include electron crystallography are being prepared for next year.

12. List SIG officers, name and e-mail, and specify their main function in the SIG:
Mauro GEMMI, Mauro.Gemmi@iit.it chair
Holger KLEIN, holger.klein@grenoble.cnrs.fr co-chair
Lukas PALATINUS, palat@fzu.cz secretary
Jérôme PACAUD, jerome.pacaud@univ-poitiers.fr, webmaster