SIG No 4 "Electron Crystallography"
Reported Period: ***2018-2019***
Report Date: 11.07.2019
Reported by: Stéphanie KODJIKIAN
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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: a strong diffusion of the technique in molecular biology.

2. SIG web site:
SIG 4 url: https://ecaelectronsig.wordpress.com/

3. Number of ECA individual members registered with the SIG according to (http://www.xray.cz/eca/im-payment.htm)
SIG 4 electron crystallography: 129

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: 66

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

6. List of MS organized by the SIG at ECM 32
MS25: Electron Crystallography as a Tool for Structure Solution and Refinement.
MS26: Metallic Complex Alloys: Periodic and Non-Periodic. (In collaboration with SIGs 03 + 12)

7. Prizes sponsored/coordinated

8. Past Activities other than Microsymposia at ECM

Title: **HyperSpy 2019 @ Diamond Light Source**
14.-15. March 2019, Oxfordshire (UK)
Number of Participants: 30
Level of involvement of SIG in the activity:

- ECA Individual Members registered with the SIG involved as lecturers

Sponsored by ECA: No

Short Description: Workshop for users of the electron physical science imaging center at Diamond light source who are interested in using HyperSpy for their data analysis. Including section on analysing scanning electron diffraction data using the pyxem Python library.

Title: **Workshop on advanced electron microscopy**
15.-16. May 2019, Trondheim (Norway)
Number of Participants: 24
Level of involvement of SIG in the activity:

- ECA Individual Members registered with the SIG involved as lecturers

Sponsored by ECA: No
Short Description: The workshop focused on electron diffraction in TEM and SEM – the possibilities given by better cameras, handling larger data sets, and complex post processing that bring electron diffraction into a new era. In this two days' workshop invited experts and skilled educators in this field will address the essentials and the latest developments through lectures, computer exercises and hands-on practical sessions using the NORTEM infrastructure in Trondheim. Lectures covered different qualitative and quantitative methods in electron diffraction.
https://www.ntnu.edu/web/temgemini/diffraction2019

Title: **Workshop on Electrochemistry in Liquid TEM and On orientation/Phase mapping in Liquid**
27.-29. May 2019, Amiens (France)
Number of Participants: 32
Level of involvement of SIG in the activity:

- 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: No
Short Description: This workshop was jointly organized by Protochips, USA and NanoMGAS SPRL, Belgium. The theme of the workshop was on the potentials of liquid cell TEM imaging with a special focus on Poseidon Electrochemistry experiments, as well as possibilities to perform nm scale orientation and phase mapping in various materials (metals, alloys, nanoparticles, battery related samples, minerals) in liquid cell. During the workshop there was demonstration on in-situ LCTEM electrochemistry experiment and also orientation/phase maps in liquid cells. Participants learnt how to extract useful texture information from orientation/phase maps and better understand liquid cell concept and applications.

Title: **Emat workshop on transmission electron microscopy**
11.-21. June 2019, Antwerp (Belgium)
Number of Participants: 30
Level of involvement of SIG in the activity:

- ECA Individual Members registered with the SIG involved as lecturers

Sponsored by ECA: No
Short Description: Hands on workshop on basic TEM, in situ TEM en tomography. A state-of-the-art training in Transmission Electron Microscopy at the highest level is provided. The main focus of the workshop was to provide practical experience with a broad range of TEM instruments. Choice was offered between 3 different modules, "High resolution TEM", "TEM Spectroscopy" and "In situ TEM", preceded by a workshop on "Basic TEM".

http://ematworkshop.uantwerpen.be/

Title: **Novel accelerators for electron diffraction**
17. June 2019, Villingen (Swiss)
Number of Participants: 50
Level of involvement of SIG in the activity:

- 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: No
Short Description: Understanding how matter creates life requires observing living cells with atomic detail. One possibility that has received significant attention in recent years is to observe the scattering of electrons on the molecules.
The goal of this workshop is to evaluate the requirements on the electron source for these experiments. We then want to assess whether novel methods to generate and to accelerate the electron beam can significantly advance this method beyond our present capabilities.
This workshop is organized by the divisions for biology as well as large research facilities of PSI, in collaboration with Advanced Accelerator Technologies.
https://indico.psi.ch/event/7413/

9. Future/Programmed Activities.

Title: **Data Analysis in Materials Science @ Microscopy & Microanalysis**
4. August 2019, Portland (Oregon, USA)
Number of Participants: 30
Level of involvement of SIG in the activity:

- ECA Individual Members registered with the SIG involved as lecturers

Sponsored by ECA: No
Short Description: Pre-meeting workshop at the Microscopy & Microanalysis conference of the Microscopy Society of America. Including section on analysing scanning electron diffraction data using the pyxem Python library.

Title**: European Crystallographic Computing Forum @ ECM32**
14.-17. August 2019, Melk (Austria)
Number of Participants: 30
Level of involvement of SIG in the activity:

- ECA Individual Members registered with the SIG involved as lecturers

Sponsored by ECA: No
Short Description: Pre-meeting workshop organized by the European Crystallographic Association's Computing Special Interest Group in advance of ECM32 in Vienna. Including talks and practicals on topics in electron crystallography.
https://ecm2019.org/satellites/ec-computing-forum/

Title : **Hot topics in contemporary crystallography - HTCC4**
1.-6. October, 2019, Dubrovnik (Croatia).
HTCC4 will be dedicated to structural biology (XFEL – X-ray free-electron laser, Cryo-electron microscopy, NMR in macromolecular structural research, Biomolecular simulations).

SIG-04 has supported this workshop organized by the Croatian Association of Crystallographers since the program of lectures and hand-on sessions provides a large place to electron microscopy. http://htcc4.org/

Title: **European Microscopy Congress EMC2020**
23.-28. August 2020, Copenhagen (Denmark).
Level of involvement of SIG in the activity:

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

10. Other matters. (50 words max.)

As the ECM is the privileged moment were SIG#4 members present the advances in electron crystallography to the whole community, we encouraged TEM manufacturers to participate to this congress, to get an impression of the interesting developments in this field, and to gain a better understanding of the key aspects in instrumentation for electron crystallography. We got positive feedbacks: most of the contacted companies will delegate scientists to ECM32 to evaluate the interest of such a congress and the presented developments.

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 took an active part in the program committee of ECM32 in Vienna, Austria. The microsymosium we organize jointly with other SIGs clearly shows the interdisciplinary interest electron crystallography induces. On our side, we are especially interested in interdisciplinary microsymposia in order to disseminate knowledge of electron crystallography to other communities and also to ever closer collaboration with structural byologists and cryo EM scientists.
A member of SIG#4 is already involved in the organization of the next European Microscopy Congress (Copenhagen, 2020).

12. List SIG officers, name and e-mail, and specify their main function in the SIG:
Stéphanie KODJIKIAN, Stephanie.kodjikian@neel.cnrs.fr, chair
Mauro GEMMI, Mauro.Gemmi@iit.it, co-chair
Lukas PALATINUS, palat@fzu.cz, secretary
Jérôme PACAUD, jerome.pacaud@univ-poitiers.fr, moderator of the mailing list