

## **SIG No: 11: Crystallography under extreme conditions**

**Reported Period: 2011-2012**

**Report Date: 23.05.2012**

**Reported by: Karen Friese, Leonid Dubrovinsky, Yaroslav Filinchuk**

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### **1. Introduction. (50 words max.)**

In the period 2012-2013 the webpage for SIG11 was developed and went online. Otherwise the activities of the SIG concentrated on organizing workshops and conferences. For these activities special attention was paid to enable the participation of young scientists in the schools and workshops. SIG11 also actively took part in planning activities and developing experimental set-ups for beam-lines at large-scale facilities, in particular at the ESRF, PETRAIII, and the FRMII.

### **2. SIG web site:**

SIG 11 <http://www.sig11online.com/> Users will be redirected from sig11.ecanews.org to this address.

### **3. Number of ECA individual members registered with the SIG according to (<http://www.xray.cz/eca/im-payment.htm>)**

SIG 11            Crystallography under Extreme Conditions            82

### **4. Existence of a SIG mailing list Yes**

**Address of the mailing list: <http://list.ehu.es/mailman/listinfo/ecasig11>**

**Number of members in the SIG mailing list : 134**

### **5. Approximate total number of researchers involved in the SIG (please indicate the basis for the estimate)**

About 200 people based on the number of participants of MS at ECM26/27 and special sessions at EHPRG and AIRAPT organised or co-organized by SIG11, and the number of members of the SIG mailing list.

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

- Structural and crystal-physical studies in large volume high-P devices
- Towards megabar pressures: complex and geo-materials
- Energy-related Materials
- Materials in operando and in situ crystallography of materials
- Aperiodic, short-range ordered, and non-crystalline materials at ambient and non-ambient conditions

Keynote Lecturers suggested by SIG11:

Prof. R. J. Angel: Minerals and Materials at high pressure: the challenges of complexity

Prof. B. Winkler: Recent advances in computational crystallography

### **7. Prizes sponsored/coordinated**

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## 8. Past Activities other than Microsymposia at ECM

Title: ESRF User Meeting, session on Dynamics and extreme conditions, 7<sup>th</sup> of February 2012, ESRF, Grenoble, France.

Number of Participants:

Level of involvement of SIG in the activity:

ECA Individual members registered with the SIG involved as lecturers

Sponsored by ECA? No

Other Sponsors/Organizers: ESRF

Short Description: Discussion on the experimental facilities for extreme condition studies at the ESRF.

Title: High pressure experimental techniques and applications to the earth's interior

Number of Participants:

Level of involvement of SIG in the activity:

ECA Individual members registered with the SIG involved as lecturers

Sponsored by ECA? No

Other Sponsors/Organizers: Bayerisches Geoinstitut, Bayreuth, Germany

Short description: This short course provided an introduction to state-of-the-art experimental methods in mineralogy, geochemistry and geophysics as applied to understanding the composition, structure and dynamics of the Earth's interior.

Title: 2<sup>nd</sup> Workshop on "Methods of High-Pressure Single-Crystal Diffraction", Satellite Workshop to ECM27, 4<sup>th</sup>-5<sup>th</sup> of August 2012, Bergen, Norway.

Number of Participants: 42

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

endorsed (SIG logo on the web page/leaflets)

Sponsored by ECA? YES

Other Sponsors/Organizers: Commercial Companies, European Mineralogical Union

Short Description: The aim of the workshop was to teach participants how to perform single-crystal high-pressure X-ray diffraction measurements and to complete the data reduction and analysis to obtain the highest-quality data. An overview over single crystal diffraction experiments at large scale facilities was included.

Title: High Pressure Semiconductor Physics International Conference HPSP-15, July 2012, Montpellier, France.

Number of Participants: 90

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

Other Sponsors/Organizers: Commercial Companies, regional Organisations and Universities

Short Description: Semiconductor physics at high pressure including sessions relating structure determination and electronic properties.

Title: IUCR Commission on High Pressure 2012 Meeting, September 2012, Mito, Japan

Number of Participants: 70-100

Level of involvement of SIG in the activity:

ECA Individual members registered with the SIG involved in the organizing committee

x ECA Individual members registered with the SIG involved as lecturers

Other Sponsors/Organizers: IUCR, Quantum Beam Science Directorate, Japan Atomic Energy Agency

Short Description: Annual meeting of the commission on high pressure of the IUCR. Individual members of SIG11 participated in the workshop which was entirely devoted to high pressure research.

Title: 50<sup>th</sup> European High Pressure Research Group Conference, Thessaloniki, Greece, 16<sup>th</sup> to 19<sup>th</sup> of September 2012.

Number of Participants: 250

Level of involvement of SIG in the activity:

x ECA Individual members registered with the SIG involved in the organizing committee

x ECA Individual members registered with the SIG involved as lecturers

Other Sponsors/Organizers: EHPRG

Short Description: (25 words max.)

The 50<sup>th</sup> EHPRG was a large scope conference. Several sessions were dedicated to subjects closely related to high-pressure crystallography; SIG11 participated in advertising the conference and in the organisation of several sessions.

Title: Workshop for Extreme Conditions Research in a Large Volume Press at Petra III, October 2012, Lüneburg, Germany

Number of Participants: ~50

Level of involvement of SIG in the activity:

x ECA Individual members registered with the SIG involved as lecturers

Other Sponsors/Organizers: Petra III/Hasylab/DESY

Short Description: In order to explore the scientific case for a Large Volume Press (LVP) program at the planned PETRA III extension, DESY invited the scientific community for a workshop to discuss the future scientific focus and technical needs of the LVP community at 3rd generation synchrotrons.

## **9. Future/Programmed Activities.**

Sig 11 is involved in the organization of 6 microsymbiosia related to extreme conditions for the ECM in Warwick. Other plans for workshops/conferences in which individual members of the SIG are involved include the following:

Title: Workshop *High-pressure diffraction and Raman microscopy in crystal genesis and mineralogy*, Satellite workshop of the International Conference on Crystallogenes and Mineralogy, September/October 2013, Novosibirsk, Russian Federation

Number of Participants: ~50

Level of involvement of SIG in the activity:

x ECA Individual members registered with the SIG involved in the organizing committee

x ECA Individual members registered with the SIG involved as lecturers

Other Sponsors/Organizers: Petra III/Hasylab/DESY

Title: 51st European High Pressure Research Group Conference, London, UK, September 2013

Number of Participants: 250

Level of involvement of SIG in the activity:

ECA Individual members registered with the SIG involved as lecturers (?)

Other Sponsors/Organizers: EHPRG

Title: IUCR Commission on High Pressure 2013 Meeting, September 2013, Hamburg, Germany

Number of Participants: 70-100

Level of involvement of SIG in the activity:

x ECA Individual members registered with the SIG involved in the organizing committee

? ECA Individual members registered with the SIG involved as lecturers

Other Sponsors/Organizers: IUCR, DESY

**10. Other matters.** ( 50 words max.)

The Web site of the SIG11 is online. At the SIG11 meeting on the 8<sup>th</sup> of August 2012 at the ECM in Bergen, new SIG officers were elected. Two special issues on different aspects of high pressure research will be published this year (Z. Krist. and High Pressure Res.). SIG officers and individual members of the SIG are actively involved as guest editors and contributors.

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

In 2012 SIG11 has organized workshops and schools which aimed at providing experimental and methodological expertise on high pressure crystallography to the scientific community, in particular to its younger members. One of them, the satellite workshop on *Methods of high-pressure single-crystal diffraction* organized at the ECM27 in Bergen, received direct financial support by the ECA. For the ECM in Bergen the SIG was involved in the organization of 5 microsymposia and suggested two of the keynote speakers. Other activities of the SIG were focused on the development of new infrastructure at large scale facilities (PETRA III, FMR II, ESRF).

**12. List SIG officers, name and e-mail, and specify their main function in the SIG:**

Chair:

Dr. habil. Karen Friese

Jülich Centre for Neutron Science – JCNS 2

52425 Jülich

Germany

Tel. +49 (0)2461 61 3826

Fax. +49 (0)2461 61 2610

e-mail: [k.friese@fz-juelich.de](mailto:k.friese@fz-juelich.de)

Vice-Chair:

Prof. Dr. Leonid Dubrovinsky

Bayerisches Geoinstitut

University Bayreuth

D-95440 Bayreuth

Germany

Tel. +49-921-553736

Fax +49-921-553769

E-mail: [Leonid.Dubrovinsky@Uni-Bayreuth.de](mailto:Leonid.Dubrovinsky@Uni-Bayreuth.de)

Secretary:

Prof. Yaroslav Filinchuk

Institute of Condensed Matter and Nanosciences (IMCN)

Université Catholique de Louvain (UCL)

Place L. Pasteur 1, bte L4.01.03,

1348 Louvain-la-Neuve, Belgium

Tel. +32-1047 2813

Fax +32-1047 2707

E-mail: [Yaroslav.Filinchuk@uclouvain.be](mailto:Yaroslav.Filinchuk@uclouvain.be)