SubStructureDynamics

Subgrain structure development in rocks and metals

Project Leader

Piazolo, Sandra, Dr.

Department of Geology and Geochemistry

Stockholm University

Universitetsvägen 10

S-10691 Stockholm, SWEDEN

Tel.: +46 8164894

Fax: +46 8 674 78 61

Email: sandra.piazolo@geo.su.se

Names of the Principal Investigators (PIs) of the Individual Projects (IPs) in the CRP

PI1) Dr. Sandra Piazolo, Department of Geology and Geochemistry, Stockholm University, SWEDEN, sandra.piazolo@geo.su.se, Tel: +46 8164744, Fax: +46 8 674 78 61

PI2) Prof. D. J. Prior, Department of Earth and Ocean Sciences, University of Liverpool, 4 Brownlow St., Liverpool, L69 3GP, UNITED KINGDOM, davep@liverpool.ac.uk, Tel: +44 151 7945193, Fax: +44 151 794 5196

PI3) Prof. J. L. Urai, Department of Geology, Aachen University of Technology, Lochnerstr.4-20, D-52056 Aachen, GERMANY, Tel: + 49 241 80 95723, J.Urai@ged.rwth-aachen.de, Fax: + 49 241 80 92358

PI4) Dr. M. W. Jessell, UMR5563, Laboratoire des Mécanismes et Transferts en Géologie, Université Paul-Sabatier, 14 Ave Edouard Belin, 31400 Toulouse cedex, FRANCE, mjessell@lmtg.obs-mip.fr, Tel: +33 (0) 5 61 33 26 47, Fax: +33 5 61 33 25 60

PI5) Prof. P. Cordier, Laboratoire de Structure et Propriétés de l'État Solide, Université des Sciences et Technologies de Lille, Bâtiment C6, 59655 Villeneuve d'Ascq, FRANCE, Patrick.Cordier@univ-lille1.fr, Tel : +33 320 43 43 41, Fax: +33 320 43 65 91

PI6) Prof. P. D. Bons, Institute for Geosciences, Eberhard Karls University Tübingen, Sigwartstrasse 10, D-72076 Tübingen, GERMANY, paul.bons@uni-tuebingen.de, Tel. +49 7071 2976469, Fax +49 7071 5059

Name(s) of the Associated Partner(s) of the Associate Project (s) in the CRP:

AP1) Dr. M. Drury, Department of Earth Sciences, Utrecht University, Postbus 80021, 3508 TA Utrecht, NETHERLANDS, martynd@geo.uu.nl, Tel: +31 30253 5108,
Fax: +31 30253 7725

AP2) Prof. C.J. Spiers, HPT Laboratory, Department of Earth Sciences, Utrecht University, Postbus 80021, 3508 TA Utrecht, NETHERLANDS, cspiers@geo.uu.nl, Tel: +31 30 253 4972, Fax: +31 30253 7725

AP3) Dr. D. Juul Jensen, Risø National Laboratory, Materials Research Department, 4000 Roskilde, DENMARK, dorte.juul.jensen@risoe.dk, Tel.: +45 46775804,
Fax: +45 46775758

AP4) Dr. D. Koehn, Institut fuer Geowissenschaften, Universität Mainz, Becherweg 21B, 55099 Mainz, GERMANY, koehn@mail.uni-mainz.de, Tel.: +49 6313 3924531, Fax: +49 6131 3923863

Abstract:

This EuroMinScI activity will bring together a network of 10 mineral and material science partners from academia and national research institutes with the aim to significantly improve our knowledge of dynamics of substructure formation and evolution in rocks and metals. The consortium is designed to break the traditional barriers that exist between the methodologies of experiments and modelling. It will integrate the currently fragmented research efforts undertaken in various EU-states, with the aim of fostering a viable network with a lifetime well beyond that of this activity. Six Early Stage Researchers and three Experienced Researchers will jointly address the dynamics of substructures within grains in polycrystalline materials.

This CPR is pioneering in its integration of in situ experimental techniques with multi-scale numerical simulations, both research areas currently at the forefront of modern research. This combination is particularly powerful as in situ techniques provide the only experiments capable of providing coherent observations in the form of a time series. These time series are crucial for the validation and extension of numerical simulations, as the post-mortem examinations which are available from traditional experimental approaches provide significantly more limited constraints for modelling. This CPR will deliver new insights in questions including
- How do new (sub-) grains nucleate and evolve?
- What are the properties and behaviour of subgrain boundaries?
- How do processes at different scales interact, from dislocations to whole grains?

In addition, significant progress in the modelling of substructure processes will be made by linking and developing hybrid models and interfacing different numerical approaches.

Through a system of joint short courses, multilateral supervision and exchanges between the hosts, the young researchers will be exposed to different schools of thought and will have the unique opportunity to gain expertise in a wide range of experimental and numerical techniques and their combination.