

Preface

Roughly every three years, there happens an International Conference on Intergranular and Interface Boundaries. iib2004 was held at Queen's University Belfast in Northern Ireland between the 25th and 29th of July 2004, drawing about 80 delegates from around the world. Being somewhat smaller than previous conferences made for a particularly cosy atmosphere and lively discussion. Long coffee breaks in the poster hall facilitated this. A special emphasis was placed upon poster presentations, for which over eight hours were allocated in the programme; in addition, each poster presenter was allowed one minute and one overhead to advertise their work at the end of each session. Thirty one invited speakers gave talks that were grouped into eleven session topics:

- Interfaces in electronic devices
- Bonded boundaries
- Magnetism and spintronics
- Structural determination I: atomic structure
- Structural determination II: electronic structure
- Segregation, diffusion and interface migration
- Biomaterial interfaces
- High temperature phenomena
- Plasticity and grain boundary engineering
- Phase transformations and thermodynamics of interfaces
- Special interfaces in metals

The programme organisers particularly wished to introduce some new areas of materials science into the series, such as Biomaterial Interfaces and Spintronics, and in these particular examples very lively and informative lectures were given by Brigid Heywood of Keele University and George Kioseoglou of NRL Washington. This in no way detracted from the more traditional core elements of our subject such as electron microscopy and grain boundary geometry. Many up to the minute experimental results, such as those of Yuichi Ikuhara of the University of Tokyo, reveal high resolution structure with elastic and inelastic electron scattering. We saw some fascinating footage from Erik Johnson of the Niels Bohr Institute showing the Brownian-like motion of molten lead inclusions in aluminium. It is said that to understand the future one should look first to the past, and in this spirit we were treated to two fascinating and illuminating presentations by David Brandon and by Olivier Hardouin-Duparc on the history of twins, grain boundaries and the coincidence site lattice from Romé de L'Isle and Häy to Sutton and Balluffi.

The world wide web locator iib2004.org will not survive the publication of these Proceedings, but the conference web pages including programme and abstracts will reside for the foreseeable future among the web pages of the Atomistic Simulation Centre which hosted the conference (see <http://titus.phy.qub.ac.uk/iib2004>).

The contributions presented in this volume represent a significant fraction of the conference material and the editors are grateful to the authors for giving further of their valuable time to record in print some of the memory of an extremely lively and enjoyable meeting. We further thank the U.S. Office of Naval Research Global, the European Office of Aerospace Research & Development (AFOSR) and the Institute of Physics for financial support.*

We look forward to gathering together again in Barcelona for iib2007!

Tony Paxton (Programme Chair)
Mike Finnis (Conference Chair)

*The content of these proceedings do not necessarily reflect the position or the policy of the United States Government and no official endorsement should be inferred.