

## WELCOME ADDRESS

This International Colloquium on *Modelling for Electromagnetic Processing* in Hannover is the fifth one in the tradition of these colloquiums organised by the University of Latvia and the University of Hannover since 1999 held in Riga or in Hannover.

This year the Institute of Electrotechnology of the Leibniz University of Hannover has the pleasure to be the host of the colloquium *MEP 2008*, which brings together scientists and researchers from universities, research institutions and industrial companies.

Electromagnetic processing of materials is a future oriented increasing field of applications for the use of electromagnetic fields. Increasing interest is observed in melting processes for metals and non-metallic materials, in the combination of melting and casting, in solidification or segregation of metals and special alloys, in crystal growth of semiconductors, in induction heating and special treatment of materials. Experimental investigations or optimisation by trials are becoming more expensive, more personal and cost consuming with an increasing complexity of the processes or they are impossible to realise under industrial conditions. Therefore physical and mathematical modelling plays a more and more important role for the analysis, the understanding of phenomena and the optimisation of processes and technologies.

The Institute of Electrotechnology of the Leibniz University of Hannover has a long tradition of education and research in this field: main activities of the institute are in induction melting of metals and metal alloys, in the last years specially in melting technology for high quality alloys, in induction heating with the use of longitudinal flux and increasingly in transverse flux heating, in use of electromagnetic fields for crystal growth in semiconductor or photovoltaic industries, in induction heat treatment, like surface hardening of complex geometries, and in electromagnetic processing of melts before solidification. Physical and mathematical modelling plays an important and necessary role for the analysis and optimisation of such processes. An increasing important field of research is the mathematical optimisation for the design of processes and devices.

The colloquium is intended to be an exchange platform for scientists and engineers presenting results in their different activities and for discussions with international experts, researchers, equipment manufacturers and users of the technologies. Moreover, the colloquium offers a forum for a review and an actual update of innovations and researches in methods of modelling for electromagnetic processing.

The present volume of proceedings includes near to 60 papers by authors coming from 15 countries. They will be presented at oral and poster sessions.

We hope that this colloquium will have the same success as the previous ones in Riga and in Hannover. We wish you interesting discussions and exchange of ideas with colleagues and friends working in the same field.

Before opening the colloquium we would like to give our thanks to all of you for attending the colloquium, to the authors for their contributions, to the organisers and the scientific committee for their co-operation and to the sponsors for their economical support.

Finally, we wish to all participants a pleasant stay in Hannover, enjoy beside the colloquium the cultural and natural attractions of the town and if you like the excursion to the historical town Celle at the end of the colloquium.

Prof. Bernard Nacke

Prof. Egbert Baake