



An ICMI-ICIAM International Study (2008-2011)



EDUCATIONAL INTERFACES BETWEEN MATHEMATICS AND INDUSTRY

A recent OECD Global Science Forum on “Mathematics in Industry” has recognized the intimate connections between innovation, science and mathematics and has recommended a new strategy for education of students, including more interdisciplinary training.

Classically students on all levels have been taught the tools of mathematics with little or no mention of real world applications, with little or no contact with what is done in the workplace (be it the classical engineering industry or other more recent activities like biotechnology, biomedicine, financial, insurance and risk sector or consulting engineering companies).

Nowadays one needs the solution of highly complex problems and hence some training to solve such problems, in particular real life problems, has to be given. More and more powerful computers make it possible to treat such complex problems and this is not done using only the shelf software but with innovation, often mathematical innovation.

An international study on Education and Training on Applied and Industrial Mathematics on the secondary and tertiary level, including technical and vocational education, is therefore necessary and timely and is being launched as ICMI Study 20. This includes secondary school, high school (also in parallel with an apprenticeship), and tertiary education at polytechnics and universities. In addition postgraduate education and retraining during the professional life must also be considered, as well as:

- survey and analysis of experiences, programmes and consortia at regional and world levels, including industrial internships, Mathematics Clinics, modelling camps and summer schools;
- identification, development and assessment of curricula that include innovative applications of mathematics, highlighting industry-driven problems; including undergraduate and postgraduate programmes in conjunction with industry;
- characterizing mathematical literacy at work at different kinds of jobs; what is needed to have professionals of the adequate level;
- students activities and interdisciplinary training; didactic materials to support teaching and learning; high school, undergraduate and graduate mathematical modelling contests (applied mathematics Olympiads);
- how to set up opportunities for secondary school teachers to participate in academic industrial initiatives;
- visions; perspectives from Industry and from Academia.

The *EIMI Study (Education Interfaces between Mathematics and Industry)* will be a first joint collaboration between the *International Commission on Mathematical Instruction* and the *International Council for Industrial and Applied Mathematics*. It was proposed by the Portuguese *National Committee of Mathematicians*, who will host the EIMI Conference in Portugal in early 2010 and the Study aims the publication of a book in the ICMI Study Series to be launched at the *ICIAM 7th Congress* of Vancouver, Canada, from July 18-22, 2011.

The *International Program Committee (IPC)* is composed by Alain Damlamian (France, co-chair), Rudolf Strässer (Germany, co-chair), José Francisco Rodrigues (Portugal, host country), Marta Anaya (Argentina), Helmer Aslaksen (Singapore), Gail Fitzsimons (Australia), José Gambi (Spain), Solomon Garfunkel (USA), Alejandro Jofré (Chile), Henk van der Kooij (Netherlands), Li Ta-tsien (China), Brigitte Lutz-Westphal (Germany), Taketomo Mitsui (Japan), Nilima Nigam (Canada), Fadil Santosa (USA), Bernard Hodgson (Ex-officio, ICMI), Rolf Jeltsch (Ex-officio, ICIAM).