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**FORWARD LOOK ON MATHEMATICS AND INDUSTRY  
PROJECT OF THE EUROPEAN SCIENCE FOUNDATION**

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A clearly emerging tendency in the world and European scientific policy is the cooperation between the mathematical academic community and the industry.

The delegates to the *Global Science Forum* (GSF) of the *Organization for Economic Co-operation and Development* (OECD) agreed in 2007 to sponsor an international consultation to assess the state of the interface between innovation, science, and mathematics in the participating countries and to identify mechanisms for strengthening the connection between mathematics and industry. A “Mathematics in Industry” workshop was organized in Heidelberg, Germany, in 2007 and a report on the same topic was published [1] which became a basis of a number of initiatives on a world- and European level. We shall describe below the most important ones.

1. The *International Commission on Mathematical Instruction* (ICMI) of the International Mathematical Union and the *International Council for Industrial and Applied Mathematics* (ICIAM) started a joint International Study (2008–2011) “Educational Interfaces between Mathematics and Industry” [2]. The aim of this study is to address the need for a fundamental analysis of the connection “Mathematics – Industry” and its impact on strategies for the education and training of students and possibly the development of new ones. In April 2010 in Lisbon, Portugal, there will be a conference on the same topic. The results of this study will be presented during the 7th International Congress on Industrial and Applied Mathematics (ICIAM2011) to be held on July 18–22, 2011 in Vancouver, Canada, as well as at the 12th International Congress on Mathematical Education (ICME-12), to be held on July 8–15, 2012 in Seoul, Korea.

2. The project “Forward Look on Mathematics and Industry” [3] of the *European Science Foundation* was launched in April 2009 with the goal of exploring ways of stimulating and/or intensifying the collaboration between mathematics and industry. It will enable the European scientific community, in interaction with policy makers, to develop medium- to long-term views and analyses of future research activities with the aim of defining research agendas at national and European level. It is expected that the Forward Look Project will impact the society by strengthening the mathematical knowledge base of a wide spectrum of research-intensive industries.

Three working groups concentrate on the following topics: “Training and career development”, “Academia–Industry interface” and “Opportunities and challenges”. They are now finalizing their reports to be presented and discussed at a Consensus conference

in Madrid on April 26–27, 2010. After incorporating the feedback from the relevant communities, the final document will be released in the publicized closing event and disseminated widely.

One of the aims of the Working Group “Training and careers” is to disseminate the *European Master program in Industrial Mathematics* (EMP-IM) [4], presented at the European Dissemination conference in Dresden, September 2009.

The Master program is created under Erasmus – Curriculum Development project (2007–2009) on the basis of the best practices in Europe, realized during the last 25 years after the establishment of the *European Consortium for Mathematics in Industry* [5] (ECMI) in 1986. ECMI is a set of 21 European universities in Austria, Denmark, England, Finland, France, Germany, Holland, Italy, Norway, Poland, Scotland, Serbia, Spain, Sweden. All of them have programs (bachelor and master) in industrial mathematics. The new integrated program is accepted for implementation in a Consortium of 9 European Partner Universities, most of them among the ECMI universities. Being a member of the new consortium implies:

- Implementing new integrated local European Masters in Industrial Mathematics on the basis of the Model Curriculum including the recognition of double degrees;
- Developing MS special courses to be shared among the Partners;
- Developing pilot e-courses to be disseminated via web. These courses are expected to cover those special topics in which each Partner is expert and jointly – to cover extensive areas of applications.
- Organizing a European Summer School in Industrial Mathematics with participation of industry and Study Groups open to students.

The Model Curriculum on Industrial Mathematics (with two branches: Techno-mathematics and Econo-mathematics) and the related educational structures are intended to serve an increasing number of Partners, thereby allowing a transfer of the advantages of the educational development to other European universities.

**3.** Some important issues of the further development of a European vision and policy recommendations on the interactions and synergy between Mathematics and economy (Industries, Companies, Banks, Insurances etc.) will be discussed at the “Mathematics in Industry” conference to be held in July 11–13, 2010 in Sofia, just after the meeting of European Mathematical Society Council.

This presentation aims at acquainting the participants of the UBM Spring conference, and, through them, the broad Bulgarian mathematical community with the goals, problems and the current activity of the “Forward Look Project”, and to provoke reflection and discussion about its impact on all levels of our educational system.

## REFERENCES

- [1] <http://www.oecd.org/dataoecd/47/1/41019441.pdf> (Last Checked: January 25, 2010).
- [2] <http://www.cim.pt/eimi/> (Last Checked: January 25, 2010).
- [3] <http://www.ceremade.dauphine.fr/FLMI/FLMI-frames-index.html> (Last Checked: January 25, 2010).

- [4] <http://www.fmi.uni-sofia.bg/kolokvium-na-fmi-1/Model-Master-version-final-septiembre-2009.pdf> (Last Checked: January 25, 2010).
- [5] <http://www.ecmi-indmath.org> (Last Checked: January 25, 2010).

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