Welcome to the workshop “Models, Simulation, Optimization: Mathematical Technologies for Industrial Innovation in Europe”

Rome, December 19-21, 2016
A variety of organizations
EU-MATHS-IN

- Founded on November 26, 2013
- Dutch “stichting”
- Network of 14 national networks
- Promoting members
  - European Mathematical Society (EMS)
  - European Consortium for Mathematics in Industry (ECMI)
EU-MATHS-IN: a unique network

- EU-MATHS-IN is a network of national networks that represent the entire community in their respective countries.
- National networks on board since the start:
  - IMNA (Austria)
  - CNMI (Czech Republic)
  - AMIES (France)
  - KoMSO (Germany)
  - HSNMII (Hungary)
  - MACSI (Ireland)
  - Sportello (Italy)
  - NNMII (Norway)
  - PL-MATHS-IN (Poland)
  - math-in (Spain)
  - EU-MATHS-IN.se (Sweden)
  - PWN (The Netherlands)
  - Smith Institute (UK)
- The existence of EU-MATHS-IN leads to new national initiatives and networks (Belgium, Bulgaria/Romania, ….)
HOW IT ALL BEGAN
Mathematics provides a universal framework for innovation, which is vital for society and industry. However, the interaction between mathematics and industry is far from optimal. Consequently, a strong inter-connected community and a vision for Europe are needed more than ever.
Final reports
Recommendation 1: Policy makers and funding organisations should join their efforts to fund mathematics activities through a European Institute of Mathematics for Innovation.

Roadmap implementation:

- EU and National funding agencies should coordinate clusters of excellence in industrial mathematics and create a European Institute of Mathematics for Innovation (EIMI) for mathematicians and users of mathematics.
- EU and European governments should set up a Strategy Taskforce for Innovation and Mathematics (STIM) in order to develop a European strategy for mathematics.
- Policy makers should put in place a Small Business Act in Mathematics (SBAM) to encourage spin-off companies explicitly using mathematics.
- EU must identify industrial and applied mathematics as an independent crosscutting priority for the Framework Programme 8.
Recommendation 2: In order to overcome geographical and scientific fragmentation, academic institutions and industry must share and disseminate best practises across Europe and disciplines via networks and digital means.

Roadmap implementation:
- Researchers in academia and industry must adapt their mentalities to the different mathematical and scientific domains they interact with, and disseminate best practices.
- The mathematical community in collaboration with industry should create a journal devoted to industrial mathematics and contribute to a European Digital Mathematics Library.
- Academic institutions and industry must facilitate the employment mobility between academia and companies.
- The mathematics community and industry should work together on real opportunities in application-themed competitions.
Recommendation 3: Mathematical Societies and academic institutions should create common curricula and educational programmes in mathematics at European level taking into account local expertise and specificity.

Roadmap implementation:
• Academia must create a European Curriculum for industrial mathematics and set up a pool of industrial mathematics engineers.
• Academia must develop new criteria to assess and recognise careers in industrial mathematics.
MISSION AND GOALS
OF EU-MATHS-IN
Mission statement

EU-MATHS-IN aims to leverage the impact of mathematics on innovations in key technologies by enhanced communication and information exchange between and among the involved stakeholders on a European level.
Aims

• **EU-MATHS-IN** shall become a dedicated **one-stop shop** to coordinate and facilitate the required exchanges in the field of application-driven mathematical research and its exploitation for innovations in industry, science and society.

• For this **EU-MATHS-IN** shall build an **e-infrastructure** that provides tailored access to information and facilitates communication and exchange by player-specific sets of services.

• **EU-MATHS-IN** will act as **facilitator, translator, educator and link** between and among the various players and their communities in Europe.
Example: European portal for mathematics jobs in industry

• During the kick-off meeting, AMIES expressed willingness to share their experiences and infrastructure
• On www.eu-maths-in.eu, EU-MATHS-IN will create a job portal advertising maths jobs in industry
• This complements web sites of the EMS and national maths societies concerning academic jobs
• Efforts needed to fill the repository, keep it up to date, advertise
Need for collaboration

- **EU-MATHS-IN** will collaborate with similarly focused institutions and initiatives worldwide
  - Before the kick-off meeting in November 2013, a 2-day meeting with the entire board of SIAM was held in Amsterdam
  - There will be a panel discussion at the SIAM Annual meeting in Chicago, July 2014, with representatives of EU-MATHS-IN
  - Joint event with SIAM in Europe (2016/2017)
  - The new ICIAM president is board member of EU-MATHS-IN

**EU-MATHS-IN** will establish strategic connections among the national networks and centers, and stimulate the cooperation at European level of mathematical research with companies and administrations
Mathematics as a Key Enabling Technology

- Key Enabling Technologies (KETs) are the main driving force behind the development of future goods and services.
- Despite the undisputed role of mathematics, there is serious concern about its support in EU programs.
- Mathematics has not been officially considered a KET in the official documents of the EU program HORIZON 2020.
  - The situation is frequently evaluated by policy makers as no problem.
  - It is argued that mathematics is supposedly present in many projects, and the projects are to be focused as a rule not on the development of particular disciplines.

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(Recommendation 1 of ESF Forward Look project)
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We strongly believe that mathematics does satisfy the criteria of Key Enabling Technology, and therefore EU-MATHS-IN is undertaking steps to achieve this status for mathematics.
EU-MATHS-IN short term goals

1. Set up and maintain European job portal maths in industry
2. Coordination of transnational applications in thematic calls of the EU - Horizon 2020
3. Compilation of European success stories of mathematics in industry
4. Lobby in Brussels for calls in applied and industrial mathematics
5. Mathematics, Simulation and Optimization (MSO) recognized as a Key Enabling Technology
6. Having EU-MATHS-IN recognized and funded as a European infrastructure
ONCE AGAIN: A WARM WELCOME

……to the workshop “Models, Simulation, Optimization: Mathematical Technologies for Industrial Innovation in Europe”