

# Proposals of Mini-Symposia for ECMI 2018, Budapest, June 18th – 22<sup>th</sup>, 2018.

## Title:

"EU-MATHS-IN: Success Stories of Mathematical Technologies in Societal Challenges and Industry".

## Key words:

EU-MATHS-IN; industrial mathematics; modelling; simulation; optimization; success stories

## Organizer(s) - Institutions

- EU-Maths-IN | Stichting European Service Network of Mathematics for Industry and Innovation
- AMIES | Agence pour les mathématiques en interaction avec l'entreprise et la société. France
- BE-MATHS-IN | Belgian Network for Mathematics in Industry. Belgium
- Czech Network for Mathematics in Industry. Czech Republic
- EU-MATHS-IN.se | Swedish Network for Mathematics in Industry. Sweden
- Finnish National Network on Mathematical Modelling. Finland
- KoMSO | Komitee für mathematische Modellierung, Simulation und Optimierung. Germany
- HU-maths-in | Hungarian Service Network for Mathematics in Industry and Innovations. Hungary
- IMNA | Industrial Mathematics Network for Austria. Austria
- MACSI | Mathematics Applications Consortium for Science and Industry. Ireland
- Math-in | Spanish Network for Mathematics & Industry. Spain
- Norwegian Network of Mathematics for Industry and Innovation. Norway
- PL-MATHS-IN | Polish Service Network for Mathematics in Industry and Innovations. Poland
- PT-MATHS- IN | Portuguese Network for Mathematics & Industry. Portugal
- PWN | Platform Wiskunde Nederland. Netherlands
- RoCAMI | Romanian Consortium of Applied Mathematics in Industry. Romania
- SM[i]<sup>2</sup> | Sportello Matematico per l'Industria Italiana (Mathematical desk for Italian Industry). Italy
- Smith Institute | Smith Institute for industrial mathematics and systems engineering. United Kingdom

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## Short description

The development of new products, production processes, or improvements in the society today is dominated by the use of simulation and optimization methods that, based on a detailed mathematical modeling, support or even replace the costly production of prototypes and classical trial-and-error methods. The use of these technologies also allows the industry a safer, more efficient, and sustainable innovation. Following the Recommendations of the Forward Look 'Mathematics and Industry' published by the European Science Foundation, several European research networks have established a new Pan-European organization to achieve the necessary interaction between the Academy and the Industry, increase the impact of mathematics on innovations in key technologies and to foster the development of new modeling, simulation and optimization tools.

On the other hand, the European Commission, in order to bring together resources and knowledge across different fields, technologies and disciplines, including social sciences and the humanities, has defined a [challenges-based approach](#).

In order to present the great potential of mathematical technologies, like key technology enabling to help to firms and administrations to advance in the industrial & societal challenges, six sessions in this mini-symposium will be organized. The main idea will be to collect and present the capabilities of EU-MATHS-IN researchers through their really industrial & societal success stories, highlighting, the benefits of transferring the involved mathematical technology for the firms or administrations customers.

In addition, one of the sessions will be devoted to introduce the goals and strategies of the EU-MATHS-IN, a European network of networks in industrial mathematics, with the objective of leveraging the impact of mathematics on innovations in key technologies, and to enhance communication and information exchange between involved stakeholders from industry and academia. In particular, special attention will be given to continue discussions on the formation of a European Technology Platform (ETP) for Mathematical Modeling, Simulation, and Optimization (MSO), with the invitation of speakers from the world of industry involved in this initiative and the European Commission with responsibilities in this area.

### **Other proposed speakers**

Participation of researchers from extra-European countries, Latin America, North America and Asia, will be encouraged in order to promote interaction between mathematical researchers from different geographical areas.

### **Industrial participation**

Whenever it will be possible, a representative from each company or administration involved in the success story will be involved in the talks, together with the researchers, to expose the business benefits obtained by the firms and administrations.

### **Roundtable**

The last session will host a Roundtable to analyze the main conclusions and propose new strategies and initiatives, will be included in the program. In this Roundtable, moderated by a representative of EU-MATHS-IN, the participation of at least one representative of the European Commission, one coming from the industrial world, and another from some administration with previous collaborations with mathematical research groups will be attempted.

### **Structure of Mini-symposia**

Five sessions will be organized following a classification by the [Societal Challenges](#) established in the EU Framework Programme for Research and Innovation H2020:

- [Health, demographic change and wellbeing;](#)
- [Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy;](#)
- [Secure, clean and efficient energy;](#)
- [Smart, green and integrated transport;](#)
- [Climate action, environment, resource efficiency and raw materials;](#)
- [Europe in a changing world - inclusive, innovative and reflective societies;](#)
- [Secure societies - protecting freedom and security of Europe and its citizens;](#)

and by industrial sectors to facilitate the firms participation (see [detailed info](#)):

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| • Agriculture and Fishing              | • Construction                             |
| • Energy and Environment               | • Service Management                       |
| • Food                                 | • Logistics and Transport                  |
| • Textiles, Clothing and Footwear      | • Information and Communication Technology |
| • Materials                            | • Economy and Finance                      |
| • Chemical and Pharmaceutical Industry | • Public Administration and Defense        |
| • Electronics                          | • Biomedicine and Health Care              |
| • Mechanics and Mechatronics           |  |

An open call will be launched to collect twenty success stories between EU-MATHS-IN members. Each National Network (NN) could collect between 1 to 3 contributions (20 short talks of 30' / 5 sessions). In case of receiving a higher number of proposals, the Organizing Committee will proceed to a selection, ensuring as far as possible that all industrial & societal challenges and all EU-MATHS-IN National Nodes will be represented.

The sixth session will feature invited speakers from the Industry, a representative of the European Commission, a representative of EU-MATHS-IN and will end with a round table to discuss the conclusion.

## Success Stories

Success stories will be written taking into account the **industrial perspective** and must clearly indicate the **Societal Challenge** and the **Industrial Sector** to which each of them belongs as well as the **Key Words** involved.

Success stories presented in the mini-symposium will become part of the EU-MATHS-IN success stories database.

The requirement for the final acceptance of the success story for the mini-symposium is to prepare a presentation in slide format, according to the template established by EU-MATHS-IN.

## **Motivation/Relevance of EU-MATHS-IN**

This network-of-networks named [EU-MATHS-IN](#), sponsored by the European Mathematical Society (EMS) and the European Consortium for Mathematics in Industry (ECMI), aims to become a dedicated one-stop-shop and service unit 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.

The organization has been established in Amsterdam on Nov. 27, 2013 with a joint meeting of the stakeholders: currently, seventeen national networks are members of the EU-MATHS-IN foundation.