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EU-MATHS-IN, Year 1

by Maria J. Esteban & Zdeněk Strakoš

The January 2014 issue of DIANOIA announced the launch of the European EU-MATHS-IN initiative to support applied and industrial mathematics in Europe. It was formally established in Amsterdam on November 27th, 2013. EU-MATHS-IN is formed as a network of national networks that represent the community in their respective countries. In 2013, at its creation, there were 6 national network members. Currently 13 countries are already on board: *IMNA (Austria), EU-MATHS-IN.cz (Czech Republic), AMIES (France), KoMSO (Germany), HSNMII (Hungary), MACSI (Ireland), Sportello Matematico (Italy), NNMII (Norway), PL-MATHS-IN (Poland), Math-in (Spain), EU-MATHS-IN.se (Sweden), PWN (The Netherlands), Smith Institute (UK)*, with Finland and Portugal getting ready to adhere soon, and Bulgaria working on it.

After the first anniversary of EU-MATHS-IN, let us make a summary of this year's activities in order to show the direction that this large initiative is taking. We hope that this will serve as inspiration for other initiatives in other countries or continents.

The EU-MATHS-IN Council met first in November 2013, and also, informally, at the ECMI 2014 conference, in Taormina in July 2014. At this occasion, a very nice and pleaseant session was organized by our colleagues from Spain and Italy, with participation from many national networks. Council meetings take place once a year, but large international conferences may be used for intermediate meetings. The Executive Committee meet on a more regular basis, the intention is to have a Skype meeting every month. The 2014 Council meeting took place on December 3rd, in Paris. During the first year of its existence, EU-MATHS-IN initiated and were involved in many activities. They include, in particular,

- Launch of the European job portal for jobs in companies or in academia, but related to industrial contracts (set-up and managed by AMIES, France).

- Proactive proposal for establishing "Mathematical modeling, simulation and optimization" as a Future Emerging Technology (FET) within the framework of the European program Horizon 2020, launched in June. As a result, the European Commission Directorate General for Communications Networks, Content and Technology (DG Connect) decided to launch an online consultation on "Mathematics and Digital Science" (mentioning High Performance Computing (HPC) in our FET Proactive text was the reason for DG Connect to couple the initiative to "digital science"). This triggered many likes and many comments, showing the strength of the concept "network of networks". This also led to the organization by DG Connect of a workshop on November 6, in Brussels, about the topic "Mathematics and Digital Sciences". The outcome of all these actions is a document which synthesizes the contributions of that day and which will serve as a source of inspiration for the writing of the Horizon 2020 Work Program 2016–2017 of DG Connect.

- Meeting with the European Commission Directorate General for Research and Development (DG R&I) on September 25th, to discuss the role of mathematical sciences within Horizon 2020 Work Program 2016–2017. This meeting was triggered by our campaign (jointly with ECMI and EMS) to sell "Modeling, Simulation and Optimization" (MSO) as a future Key Enabling Technology (KET). Further to this, we published a position paper on our website, which can be read here. www.eu-maths-in.eu/index.php?page=generalReports

- Meeting with DG Connect on December 15th, to discuss the document "Mathematics and the Digital Sciences" (see also the website above) and to further discuss how the mathematical community could enter into EU programs.

- Ongoing initiative for an e-infrastructure proposal within the EC call eINFRA-5 (January 2015 deadline). This project will include work packages corresponding to the projects of EU-MATHS-IN as well as some work package lead by the consortium EuDML devoted to digital mathematical libraries.

- Discussion with the European Network for Business and Industrial Statistics (ENBIS, www.enbis.org) about possible collaborations. ENBIS has expressed an interest to join EU-MATHS-IN, but this is not possible unless there is a change of statutes. Cross participation in council meetings and discussion of joint initiatives will take place.

- Coordination of a COST proposal Modeling, Simulation, Optimization and Control of Large Infrastructure Networks, which was not accepted for funding.

- Two-day meeting with the President and two Vice-Presidents of SIAM. The goal was to exchange information on actions related to mathematics and industry both in the US and in Europe, to discuss

existing documents and to define a strategy for further collaboration. As a result there have already been some actions (see below) and there is a project of a SIAM annual conference organized in Europe jointly with EU-MATHS-IN or one of its networks.

EU-MATHS-IN works on outreach by presenting the network-of-networks and its activities at various occasions:

- Article in SIAM News, December 2013.
- European Mathematics Representatives Meeting (EMRM) in Helsinki, May 9, 2014.
- ICIAM council meeting in Columbus, May 17, 2014.
- ECMI conference in Taormina, June 11, 2014.
- Panel discussion at SIAM Annual Meeting, July 2014.
- Meeting of Portuguese Mathematical Society in Braga, September 26, 2014.
- Meeting of the EMS-AMC (Applied Math Committee of the EMS) in London, October 24, 2014.

Conclusion for the first year:

- The quick increase in the number of countries which are part of our network is a very encouraging factor. Also, there have been a large number of presentations in various conferences or before various institutions.
- The contacts of EU-MATHS-IN with the European Commission structures in Brussels have increased in the past year, and regular contacts both with DG R&I and in DG Connect have been established.
- Developing EU-MATHS-IN as the network of networks was an excellent idea. It is a strong concept regarding discussions with the EU structures and representatives. It demonstrates unity in action for the same cause. That has been recognized in many EU countries. Together we have a chance for changing the global situation for mathematics in Europe.
- It is crucial that EU-MATHS-IN fosters its collaboration with the partner organizations worldwide, including ICIAM. We certainly have to pay more attention to the visibility of mathematics, and learn from the experiences of other disciplines.
- We should also be present and active in the emerging discussions on the role of mathematics in applications and explain our views actively. The inspirational article titled "Is Big Data Enough?," a Reflection on the Changing Role of Mathematics in Applications, by Napoletani, Panza and Struppa, that appeared in the May 2014 issue of the *Notices of the AMS*, shows that the ideas presented by EU-MATHS-IN on various occasions have a solid basis and resonates with the field at large. In particular, as well argued and substantiated in the above mentioned article, HPC and Big Data require mathematics not only in the form of particular tools for solving separated problems, but also, more substantially, as integrated methodology which could develop in order to enable understanding the phenomena.

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