

Impact

- *1st Study Group in Cyprus* (125th ESGI) 5-9 December 2016. 50 researchers from 17 countries, 4 industrial problems from diverse sectors
 - Water management (government),
 - Bus route optimization (large company)
 - Ice distribution logistics (SME)
 - Toy manufacturing (SME)
- Research solutions for companies without inhouse R&D - very positive feedback:
The event has proved that high level mathematics can indeed be applicable to industrial problems and help companies move towards scientific and innovative solutions -Costas Sisamos, Managing Director, ENGINO TOY SYSTEMS



Impact

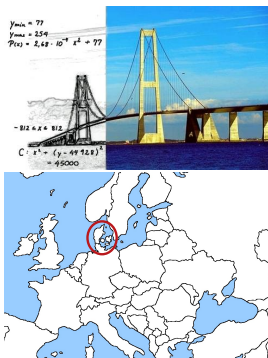
- Creation of longer-term projects:
 - ① June 2017: follow-up project with the Water Development Department. Additional funding from WDD, MI-NET STSM, and Oxford
 - ② October 2017: MI-NET STSM to Nikos Ploskas (MI-NET Greece) for the bus routes problem
- 2 journal publications
- Mobilization of Cypriot mathematical researchers interested in real-life problems - a new community emerging
- International collaborations
- A mentoring team of senior, international experts (Scientific Board)
- Interest in industrial maths from Cypriot companies, universities, and the Chamber of Commerce and Industry

Dissemination

- Online presence (website www.esgi-cy.org & Facebook Page)
- Several mentions in the media (print and online)
- Industry-academia workshop in October 2017 (MI-NET funding)
- ECMI blog post on the water problem

Future plans

- 2nd Study Group with Industry in Cyprus in December 2018 in collaboration with the EU project (scishops.eu). Focus on societal challenges
- Continue disseminating the results and impact so that the universities and the companies (and the government) invest in the area



Dissemination

- Seminars & Colloquia about Industrial Maths in general, and the efforts of MI-NET

Impact

- The next Study Group will be a joint Danish-Norwegian ESGI, supported by MI-NET

Future plans

- Continue to hold ESGI's

Dissemination

- Information about MI-NET initiatives has been distributed to fellow mathematics departments, researchers and doctoral students, as well as industrial collaborators.
- MI-NET has been mentioned in applications for country-level and international funding.

Impact

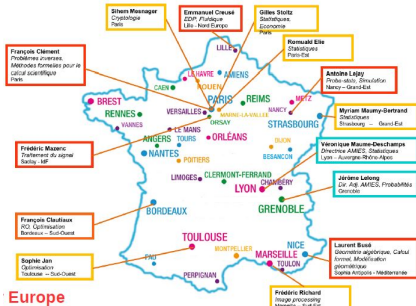
- Networking and successful STSMs.

Future plans

- Collaboration with industries.
- Study Groups.
- Spreading ind. math concept and activities in developing countries.



France (Edwige Godlewski, Georges-Henri Cottet, Christophe Prud'Homme, Joost Rommes)



Europe

AMIES: French agency for math-industry relations

Dissemination

- Publicity via AMIES network

Impact

- Increased awareness of MI-NET funding possibilities

Future plans

- Appoint AMIES interlocutors for Europe: Marianne Clausel, Christophe Prud'Homme
- Encourage application for MI-NET funding for international modelling weeks, industry study groups (SEME)

Dissemination

- Advertisements during workshop and conference presentations
- Maths meets industry, Trondheim, Sept. 2016

Impact

- in Germany low, strong competition with state funded Math & Industry program
- in Norway higher, no culture of collaboration with industry
- first ESGI together with DTU in June 2018

Future plans

- try to establish sustainable ESGI "culture" in Norway
- contribute to Math in Industry, particular Digital Manufacturing via ECMI SIGs and European collaborative research



Dissemination

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- Advertised MINET to colleagues through social networks (LinkedIn, ResearchGate, etc).
- Communicated the activities of the network during personal contacts and meetings in national conferences and events held in Greece.



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Future plans

- Continuation of the research cooperation with the colleagues we met in MINET and worked together
- Intention to participate actively in a forthcoming or future relevant COST action.

Dissemination

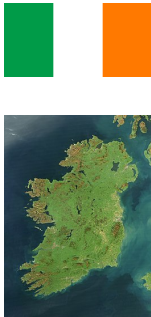
- Twitter: announcements and results from our ESGI Study Groups.

Impact

- International publication stemming from the first Cyprus ESGI: ANTONIOU, E., ARAÚJO, A., BUSTAMANTE, M., & GIBALI, A. (2018). **Physically feasible decomposition of Engino toy models: A graph-theoretic approach.** European Journal of Applied Mathematics, 1-20. doi:10.1017/S0956792518000086

Future plans

- Upcoming ESGI 141: Dublin, 25-29 June 2018, maths.ucd.ie/esgi141



Dissemination

- MI-Net activities and funding opportunities have been advertised through
 - national applied and industrial mathematical mailing lists
 - personal web pages of the MC members



Impact

- Organization of an ESGI (Rome) and a MW (Verona)
- Enhancement of scientific cooperation between different nations
- Contribution in preparing Handbooks for ESGI and MW



Future plans

- Production of a scientific joint paper (COST TD1409 Acknowledged)- Italy, Ireland, Portugal the subject: "Materials selection and joining processes: a pattern recognition theory approach".
- Involvement in new H2020/COST projects on specific industrial mathematical applications

Dissemination

- mathforbusiness.ktu.edu for dissemination of ESGI has been launched in November 2017
- MMA2016 Tartu, Estonia, MMA2017 Druskininkai, Lithuania



Impact

- VGTU joined COST 1409 action (MI-NET) in 2016, KTU joined MI-NET in May 2017
- Kaunas Chamber of Commerce Industry and Crafts became partner of KTU
- VGTU new study program on Mathematics of new smart technologies

Future plans

- MMA2018 May 29 - June 1, 2018, Sigulda, Latvia
- Workshop of Mathematical Solutions in Business and Industry (ESGI 142) June 11 - 15, 2018, Palanga, Lithuania
- We plan to introduce ESGI to Lithuanian Confederation of Industrialists, the richest and most influential organization of industry representatives.
- Joint industrial works of VGTU with WIAS, ITWM (Germany) and Vilnius University
- ESGI, 2019, June ??, Lithuania



Dissemination



- MI-net activities and calls have been distributed via the normal channels and also via the dedicated "press website" (WPD)
- MI-net activities were discussed at meetings of the Committee on Innovation of the Platform Wiskunde Nederland
 - ① Vivi Rottschäfer is chair of this committee
 - ② Wil Schilders is executive director of PWN
- At our ESGIs (SWI), participants from other EU countries were present/invited
 - ① The SWI has been organized annually since 1998 with generous support of the national funding organisation NWO
- We aided in setting up ESGI in Bulgaria



Wroclaw - Old
Town Hall

Dissemination

- Mini Conference on Industrial Applications of Mathematics - Polish Academy of Science - Warsaw (3rd-4th July 2017)
- XLVII National Seminar of Applied Mathematics - Wroclaw University of Environmental and Life Sciences - Kobyla Gora (10th-13th September 2017)
- Regional Educational Conference for High School Teachers - Faculty of Education of town Rawicz (12th April 2016)



Milicz Ponds

Impact

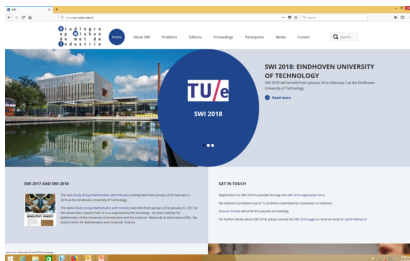
- Improvement of contacts with companies
- Increasing interest in industrial mathematics on national level

Future plans

- Preparation of industrial workshops on national level with participants from MI-NET

Impact

- The recently completely renewed webpage <http://www.swi-wiskunde.nl/> is very successful, and contains a lot of information about past SWI
- At the Dutch Mathematical Congress (NMC 2018) on April 3-4, a mini-symposium on SWI will be organized



Future plans

- We will appoint a person for 1 day per week, initially for 1 year, who will be dedicated to the follow-up of problems from SWIs. A report on this "pilot" will be issued
- Organize knowledge exchange/network meetings for companies

Dissemination



- ICT 2015 Innovate, Connect, Transform, Oct 2015 (Lisboa);
- COST news in *Gazeta de Matemática*, a journal devoted to popularisation of Mathematics;
- ESGI-PT reported in *CIM Bulletin*, a biannual publication that aims to promote mathematical research;
- 10 ESGI-PT posters;
- COST event *Inspiring researchers, strengthening Europe - Portugal in the spotlight*, Feb 2017, Lisboa;
- COST Connect on *The Relevance of Impact in R&I Policy*, Nov 2017, Brussels.

Impact



- An ESGI edition each year: ESGI 119 (Porto, 2016); ESGI 125 (Aveiro, 2017); ESGI 140 (Barreiro, 2018).
- Several IWs: Big Data: Materials in Pharmaceutical Industry, November 2016 (Coimbra, 2016); Mathematics in Industry 4.0 (Porto, 2017); Mathematics and Wild Fires (Coimbra, 2018), etc.
- An Iberian Modelling Week: Apr 2016 (Porto).

Future plans

- To create a CoLaB on Industrial Mathematics.



- By inviting the Vice-President, Prof Dietmar Hoemberg, to CAIM2017 as invited speaker, see: https://www.romai.ro/conferintele_romai/caim2017_en.html
- I have widened the horizons of the issues arising from the industrial sector (Meeting in Cyprus Dec. 05-09, 2016);
- Regarding the impact of the Action TD 1409 in my country, I appreciate it is still premature to make an evaluation.
- Requesting funds for organization of international conferences CAIM2018 and CAIM2019: see https://www.romai.ro/conferintele_romai/romai_conferences.html

MI-NET in Slovenia

dr. Janez Povh¹

¹University of Ljubljana, Faculty of mechanical engineering, Slovenia

Ljubljana, March 21 2018

The main dissemination activities were related to ESGI, organised in Slovenia in September 2017. Janez Povh as representative of Slovenia communicated with all three math faculties in Slovenia. They were:

- ▶ informed about funding possibilities through MI-NET;
- ▶ invited to prepare ESGI project;
- ▶ included in the realisation of ESGI.
- ▶ Additionally: results of this ESGI were presented at a special session at SOR2017 conference.

ESGI had impact:

- ▶ We strengthened contacts with colleagues from Serbia who participated and also proposed a problem;
- ▶ ESGI was one of the very few joint projects with more than one Slovenian math faculty involved;
- ▶ Students lived 5 and worked days in same building owned by Slovenian mathematical society and became a community;
- ▶ However: better problems needed (some were too trivial, some too difficult, some even not well-defined);
- ▶ Easier to get master students than PhD or postdocs.
- ▶ We plan: new lab for industrial mathematics at University of Ljubljana;

Dissemination

- **115 European Study Group With Industry**



| Centre de Recerca Matemàtica (CRM),
MI-NET and **math-in**.

| 01/25/2016 - 01/29/2016. **Barcelona**.

| 4 Problems. **Fusion for Energy; Institut
Català de Nanotecnologia i Nanociència;
Mossos d'Esquadra**.

| Dissemination: **Blog madrid +d**
(10/29/2016); CRM Website; **La Vanguardia**
(10/26/2016); math-in Website (12/29/2015,
1/29/2016 and 10/26/2016).



Dissemination



- **122 European Study Group With Industry**

| **ITMATI, MI-NET and math-in.**

| 09/19/2016 - 09/23/2016. **Santiago de Compostela.**

| 4 Problems. **ASTI; iAuditoria; Teknova AS; ECOMT.**

| Dissemination: ECMI (07/31/2016); European Mathematical Society (06/21/2016); **Galicia Confidencial** (09/19/2016); ITMATI Website (09/02/2016 and 09/29/2016); KoMSO; math-in Website; MI-NET (10/11/2016); RSME (06/27/2016 and 09/15/2016); SeMa (06/23/2016).



Dissemination



- **122 European Study Group With Industry**

| Dissemination: EU-MATHS-IN; **Galicia Ciencia** (07/26/2016); Maths in Industry; The Association of European Research Societies(08/24/2016); Universidad Complutense de Madrid (08/01/2016); Universidad de Granada; Universidad de La Laguna (06/29/2016).



Dissemination



- **131 European Study Group With Industry**
| **BCAM, MI-NET** and **math-in**.
| 05/15/2017 - 05/19/2017. **Bilbao**.
| 4 Problems. **CIE Automotive; Eroski Group;**
| **FON; Xpheres.**
| Dissemination: BCAM; BCAM News
(05/10/2017); BCAM Blog; ECMI
(06/22/2017); math-in web (12/27/2016
03/04/2017, and 02/05/2017); RSME.



Dissemination



• XI Industrial Mathematics Forum

ITMATI and MI-NET.

02/12/2016. A Coruña.

Industrial Organizations: **AFI**; Centro de Innovación Aeroespacial; **CETUS Group**; Clúster de la madera y del diseño de Galicia; **EcoMT**; Grupo **PRISA**; Soltec Ingenieros.



Universidade de Vigo



CETUS GROUP
Innovación de Tecnología



PRISA SOLTEC
ingenieros

Dissemination



• XI Industrial Mathematics Forum

Dissemination: **ABC**; **AMTEGA**; **Clúster da Madeira e do Deseño de Galicia**; **Código Cero**; **Eldia.es**; Facultad de Informática UDC (02/10/2016); **Finanzas.com**; ITMATI (02/12/2016) and (02/16/2016); **La Vanguardia**; math-in (12/22/2015); **Igaciencia.eu** (02/11/2016; **Noticias Galicia** (02/11/2016); Matemática Blog (02/17/2016); MI-NET and blog (02/4/2016); SeMA (02/12/2016); CITIC (02/12/2016); University of A Coruña (02/11/2016); **Xunta de Galicia**.



Dissemination



- **Industrial Applications of Computational Algebra, AICA 2016**



| (Red-EACA), MI-NET and math-in.

| 06/21/2016. **Logroño.**

| Industrial Organizations. **AERTIC; CTC;**
Deimos; Quantitas Energy.

| Dissemination: Universidad de La Rioja; math-in
Website (02/01/2016 and 04/21/2016).



Dissemination



- **Workshop on mathematical solutions for Industry: Success stories and perspectives**

| **ICMAT, MI-NET and math-in.**

| 10/27/2016 and 10/28/2016. **Madrid.**

| Industrial Organizations. **AESA; AFI; BCAM; BSCH; CICEnergiGUNE; CNES;**

| **Consortium Madrid-MIT M+Visión;**

| **Fundiciones Rey; GKN Driveline; IGME; ITMATI; IS3D Engineering.**

| Dissemination: **Europa Press** (10/26/2016),
ICMAT; math-in webpage (08/24/2016) and
(10/10/2016).



Dissemination



• III Iberian Modelling Week

Universidade do Porto, PT-MATHS-IN, MI-NET and math-in.

04/11/2017 - 04/15/2017. **Porto.**

4 Problems.

Dissemination: ECMI (04/07/2016); ITMATI (03/11/2016); math-in web (03/31/2016, 05/02/2016, 08/26/2016 and 03/07/2017); University of Porto.



Quantitative Indicators



Indicator	ESGI	InD	MW	Forum	Total
Events	3	2	1	1	7
Industrial problems	12	0	1	0	13
Problems faced	12	0	4	0	16
Participant companies	11	16	0	7	34
Academia	10	22	7	3	42

STSMs	Foreing Researchers in Spanish Institutions	Spanish Researchers in Foreing Institutions	Total
2016	3	0	3
2017	1	2	3
2018	0	2	2



Collaborations*	ESGI	InD	MW	Forum	Total
Thesis Project	1	0	0	0	1
Master Dissertation	1	0	0	0	1
Jobs	1	0	0	1	2
Contracts	3	0	1	2	6
Other	7	0	0	3	10

*Some data is being collected at this moment

Quantitative Indicators



Media Impact	ESGI	InD	MW	Forum	Total
External Press	16	14	5	5	40
Academic Press	13	7	7	2	29
Subtotal	29	21	12	7	69



Future Plans



- Currently **3 ESGIs** are being organized: 2 by **ITMATI** (139, July 2018 and 144, April 2019) and 1 by **CRM**, both members of **math-in**. The **IV Iberian Modelling Week** was held in Vigo from October 16 to 20, 2017.
- In addition, the realization of **ICIAM 2019** is also being organized.
- Subsequent to MI-NET, Industry Days, ESGIs and Iberian Modeling Weeks will be organized if it's possible.
- In addition to the Modeling Weeks Handbooks and the ESGI Handbooks, we believe that it is useful to have a **Cases Study Handbook**.

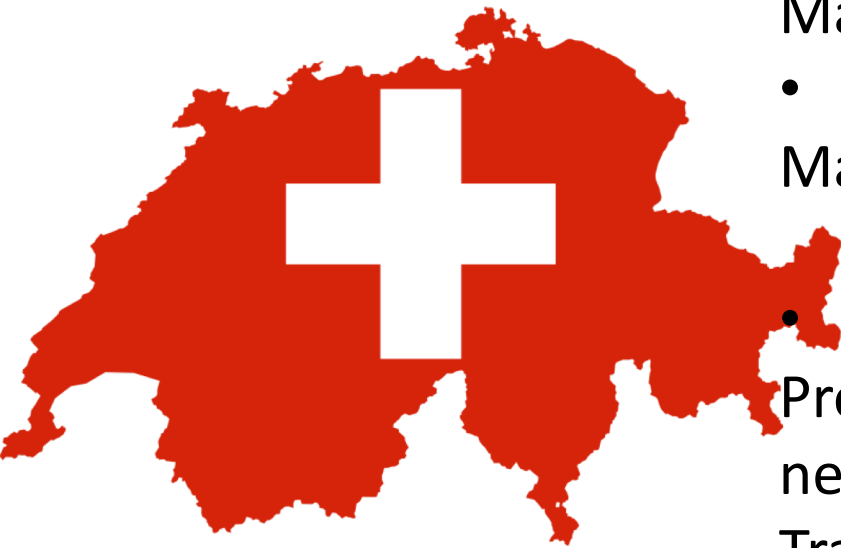


Thank you very much for your attention!



COST Mathematics for Industry

Switzerland



Dissemination:

- 2016 – 1st COST Conference on Mathematics for Industry in Switzerland
- 2017 – 2nd COST Conference on Mathematics for Industry in Switzerland
- 2018 – 3rd COST Conference on Mathematics for Industry in Switzerland
- The Swiss National Science Foundation Project “Mathematics and Fintech – The next revolution in the Digital Transformation of the Finance Industry”

Impact:

Jörg Osterrieder, Dirk Wilhelm

- A new continuing education course on "Big Data Analytics, Blockchain and Distributed Ledger" has been created
- Iteration of the COST conference saw a large number of international guests and speakers, travelling to Switzerland from destinations such as the UK, Germany, the United States and Bulgaria
- Associate Editor for a new Springer Journal «Digital Finance»
- Several invited talks at European conferences
- Several published papers
- 3 STSM coming to Winterthur



Future plans:

- Enhance our European integration
- New COST application on “Fintech and AI in Finance” with focus on EU13 countries
- Joint Research programs in the context of H2020 and COST
- Enhanced cooperation with universities from Ireland, Germany, Sweden, Dubai, Singapur and others

MI-NET

joerg.osterrieder@zhaw.ch

NEW Initiative: Artificial Intelligence in Finance



School of
Management and Law

School of
Engineering

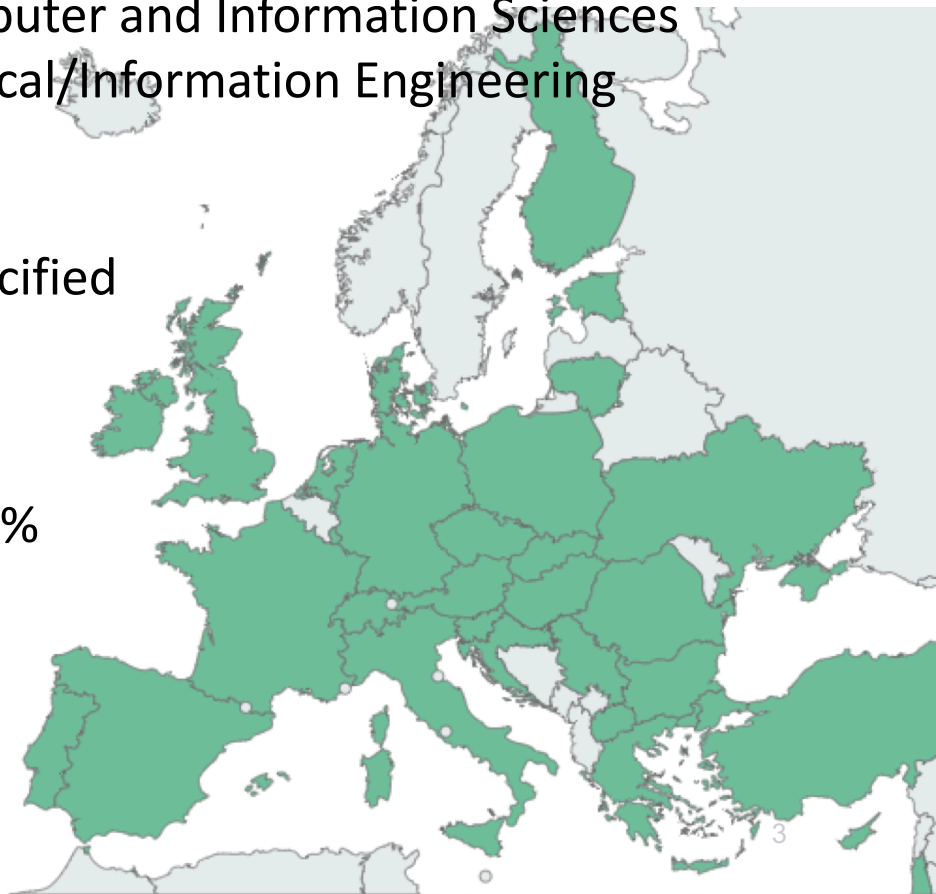
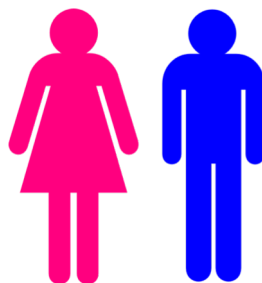
Countries (31) :


Austria, Bulgaria, Croatia,
Cyprus, Czech Republic,
Denmark, Estonia, Finland,
France, Germany, Greece,
Hungary, Ireland, Israel,
Italy, Lithuania,
Luxembourg, Netherlands,
Poland, Portugal, Romania,
Serbia, Slovakia, Slovenia,
Spain, Australia,
Switzerland, Turkey, United
Kingdom, FYR Macedonia,
Ukraine

Core Expertise of Proposers:

- 41.3% Economics and business
- 22.8% Mathematics
- 22.8% Computer and Information Sciences
- 4.3% Electrical/Information Engineering
- 5.5% Other
- 2.2% Law
- 1.1% Unspecified

32.6% 67.4%





Dissemination

- Sent out emails to top 5 university math and engineering departments about the calls

Impact

- Networking with fellow members
- Increased visibility of industrial mathematics field within the country and the COST action

Future plans

- Utilize STSM calls to increase awareness of the field within the country

Dissemination

- Industrial Maths JiscM@il, ESGI email lists
- MI-NET website, social media
- OCIAM bulletin

Impact

- Support for study groups and modelling weeks (e.g. Oxford June 2016, Glasgow September 2016, Edinburgh May 2017)
- Travel support for UK researchers to overseas study groups
- Short-term study missions (both to and from UK), especially as follow-up to study groups

Future plans

- Annual Study Groups with Industry
- Specialised Study Groups (e.g. recent themes of Agri-Food, Energy systems; organised by KTN)
- Upcoming EPSRC / Innovate UK KTN review of Knowledge Exchange in the Mathematical Sciences