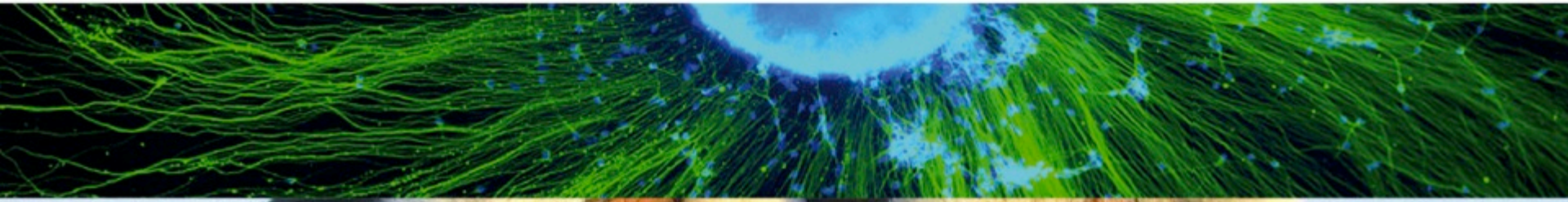
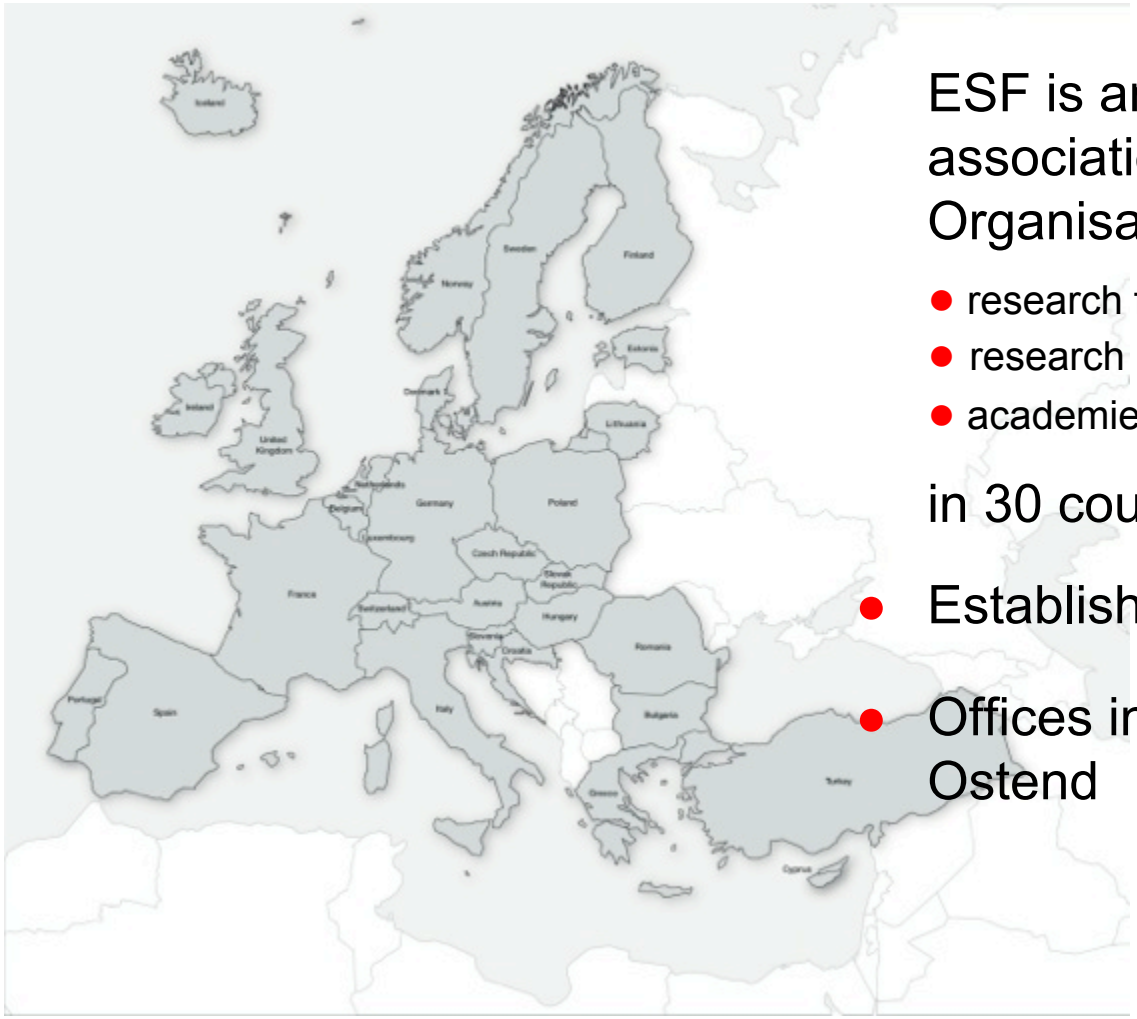
EUROPEAN SCIENCE FOUNDATION

# European Science Foundation



# ESF Member Organisations



ESF is an independent association of 75 Member Organisations

- research funding organisations
- research performing organisations
- academies and learned societies

in 30 countries

- Established in 1974
- Offices in Strasbourg, Brussels, Ostend

# Setting Science Agendas for Europe

The European Science Foundation provides a common platform for its Member Organisations in order to:

- **advance European research**
- **explore new directions for research at the European level**

Through its activities, the ESF serves the needs of the European research community in a global context.

# ESF covers all scientific domains

## Standing Committee domains

- Humanities
- Life, Earth & Environmental Sciences
- Medical Sciences
- Physical and Engineering Sciences
- Social Sciences

## Expert Board/Committee domains

- Marine Sciences
- Materials Science and Engineering
- Nuclear Physics
- Polar Sciences
- Radio Astronomy
- Space Sciences

# ESF Activities

## SCIENCE STRATEGY

- Forward Looks
- Science Policy Briefings
- Exploratory Workshops

## SCIENCE SYNERGY

- EUROCORES Research Programmes
- Research Networking Programmes
- Research Conferences

## SCIENCE MANAGEMENT

- Peer Review support
- Coordination of EUROHORCs projects
- COST and Coordination of ERA projects

**Member Organisation Fora**

# ESF Member Organisation Fora

- Discussion platforms for Member Organisations to develop joint strategy
- Time-limited activities, typically two years

| Titles of the MO Fora | Number of ESF Members involved | Number of Observers |
|---|---|---|
| **Research Integrity** | 36 | 6 |
| **Research Infrastructures** | 30 | 8 |
| **Science in Society Relationships** | 35 | 1 |
| **Evaluation of Publicly Funded Research** | 36 | 7 |
| **Evaluation: Indicators of Internationalisation** | 23 | 1 |
| **Peer Review** | 32 | 7 |
| **Scientific Foresight for Joint Strategy Development** | 22 | 1 |
| **European Alliance on Research Career Development** | 19 | 5 |
| **Total** | **227** | **33** |

▶ ***www.esf.org/mo-fora***

# Research Conferences

- Interdisciplinary scheme in collaboration with institutional partners
- Stimulate dialogue between early-stage researchers and scientific leaders worldwide
- Cover topics proposed by the scientific community
- Grants of 20-40 k€ per conference, including specific support for early-stage researchers
- Organisation by ESF conference unit
- Ongoing improvement – we welcome your feedback by filling in the survey sent after each conference

▶ ***www.esf.org/conferences***

# Making Conferences Greener
# Research Conferences Forest

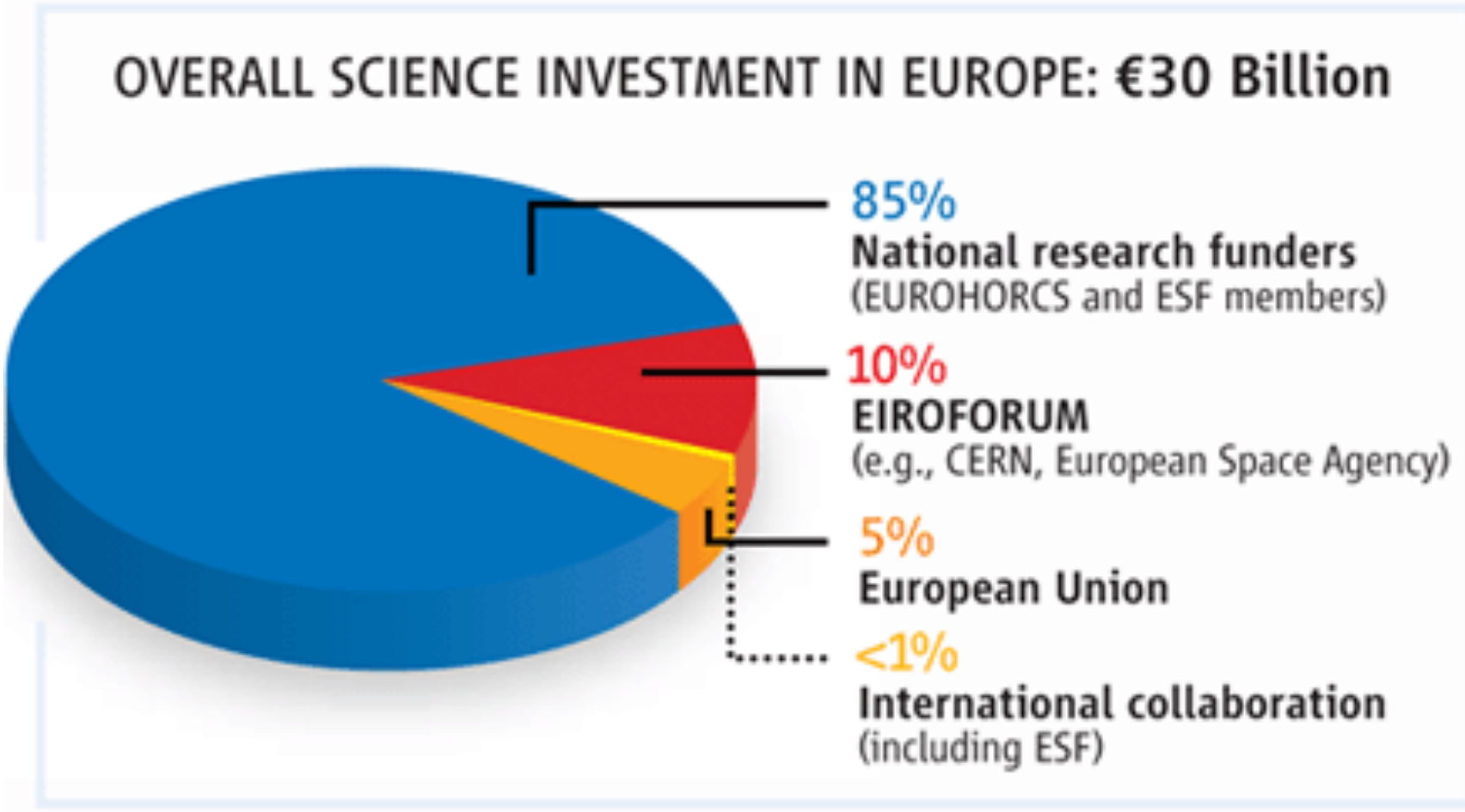
In 2011 a 4 Euro green fee was incorporated into the conference fee. This money contributes to the offsetting of the $CO_2$ emissions created when participants travel to our conferences.

The Research Conferences Forest will have 9609 Moringa trees
Within their life span, these trees will be able to offset 1750 tons
In addition to the carbon offset, the trees also counter desertification, enhance soil fertility, and provide nutrition & work to local inhabitants in Dosso, Niger.

tree-nation

**www.esf.org/activities/esfconferences/making-conferences-greener**

# European Science Funding



# A time of change

Creation of **Science Europe**: "*A united voice for science in Europe, to lead the future of the European Research Area*"

Increased focus on influencing policy that impacts European research and science.

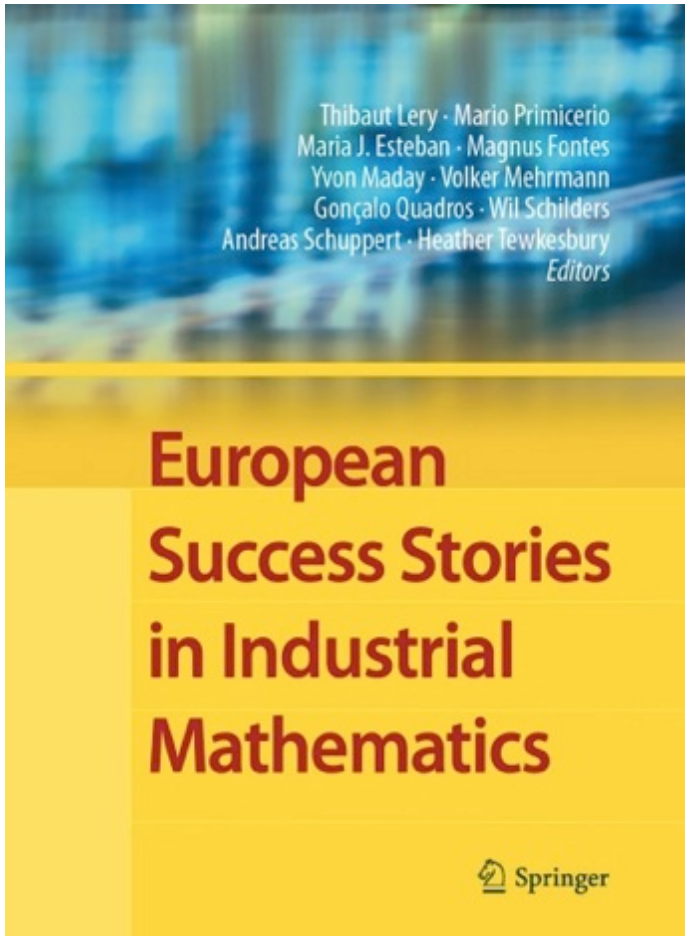
At the moment ESF is in a period of transition and is currently developing its multiannual plan accordingly.

# ESF activities in Maths

- Activities in Mathematics @ ESF
  - 11 Research Networking Programs,
  - 7 annual conferences as part of a ESF-EMS partnership,
  - 6 Exploratory Workshops,
  - 1 EUROCORES (eurogiga)
  - 1 Forward Look (Maths and Industry)
  - 1 proposal to the European Commission (VEIMI),
  - 1 potential ERANet with European funding agencies.
  - ESF/JSPS conference on “Mathematics for Innovation”
  - National initiatives in Paris (AMIES), Berlin (MATHEON), IE, ES.
- The International Mathematical Union (IMU) opened its first permanent office in Berlin. During the multi-stage selection process, Berlin won out against Toronto, Rio de Janeiro, and several other cities in a bid to become the home of the IMU.

# Forward Look on mathematics and industry

European Mathematical Society

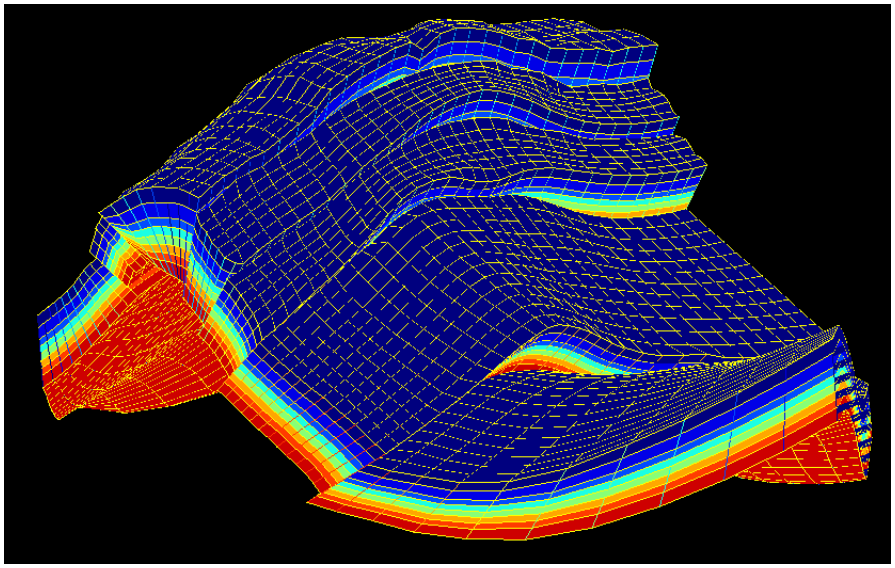
# Same mathematical solution applied in several companies

*Imbalance Estimation in Rotating Machinery*

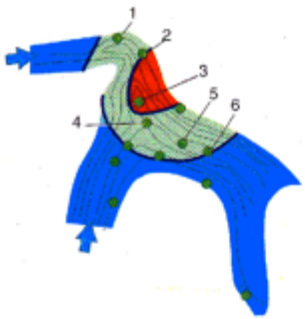
- In most cases the balancing of rotating machinery is a time consuming and expensive process.
- Modern mathematical methods allow researchers to reduce the vibration of rotators.
- The developed methods have been used in industry, e.g., with
  - **RollsRoyce** (for reconstruction of imbalances in aircraft engines)
  - **Siemens** Automation and Drives (for generators)
  - **Oerlikon Leybold** (for vacuum pumps)
  - **BerlinWind** (for wind power plants).

# Drilling in the oil industry

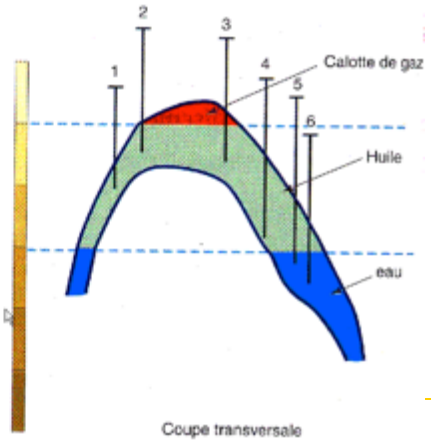
Philippe RICOUX **TOTAL**



- Salt or oil reservoirs
- 4000 – 6000 m height Reservoir
- 10 to 100 m width only !!!!
- **In 1995: 1/3 of 15 test drills were successful**
- **Thanks to HPC in 2008 : 2/3 of test drills are successful**
- **5 drills are saved (8m€ per drill)**




Gisement vu du dessus
et implantation des puits




Coupe transversale

Maths and Numerical Analysis is becoming a new real job by itself in Oil Industry

Interdisciplinary Teams : Geologists, Geophysicians, Mathematicians, Numericists, Computer Scientists

# Recommendations

**Policy makers and funding organisations should join their efforts to fund mathematics activities through a European Institute of Mathematics for Innovation.**

Roadmap implementation:

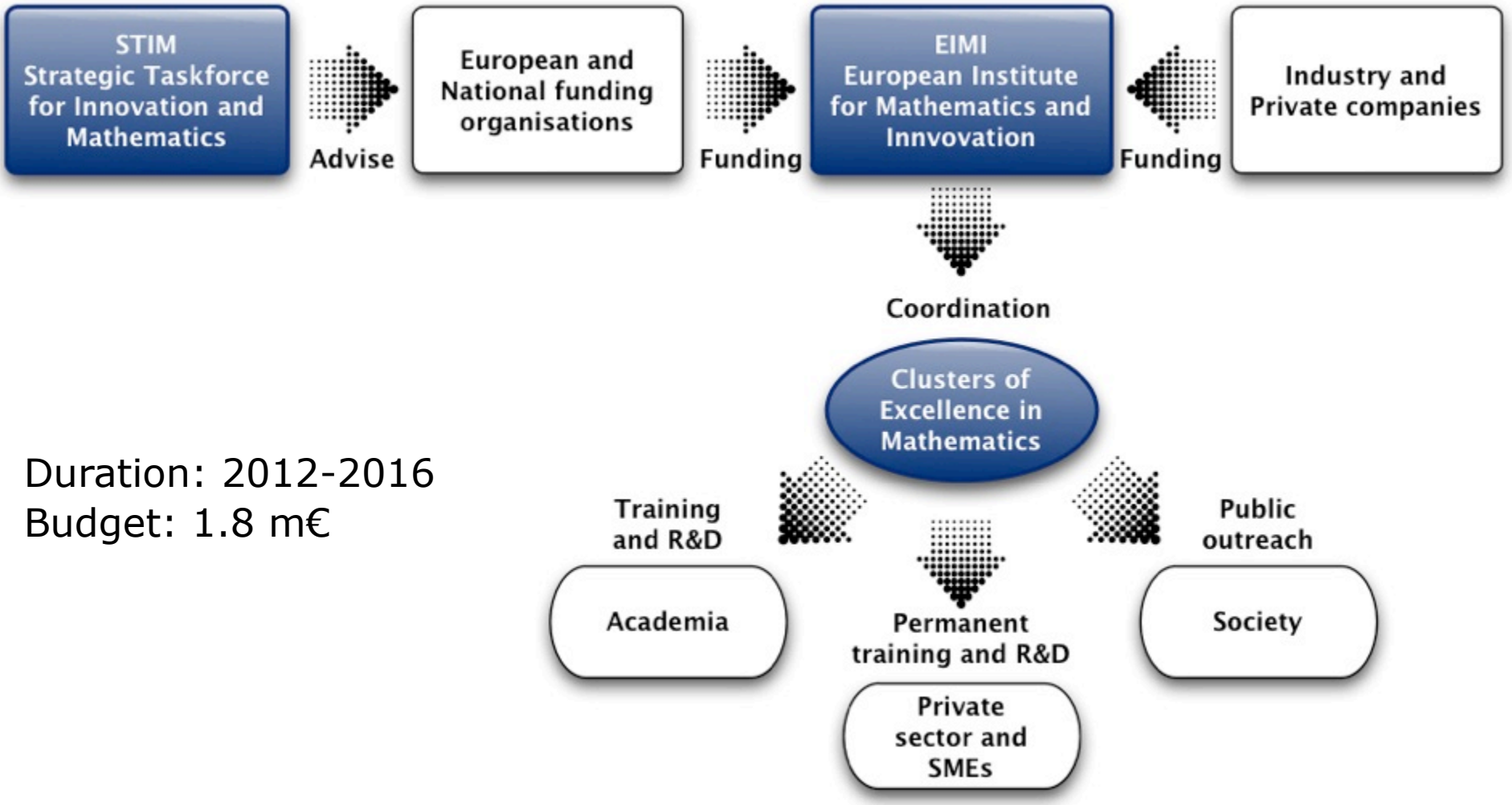
- EU and National funding agencies should create a ***European Institute of Mathematics for Innovation*** **(EIMI)**.
- EU must identify industrial and applied mathematics as an independent crosscutting priority by the European Commission

# Recommendations (continued)

**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.**

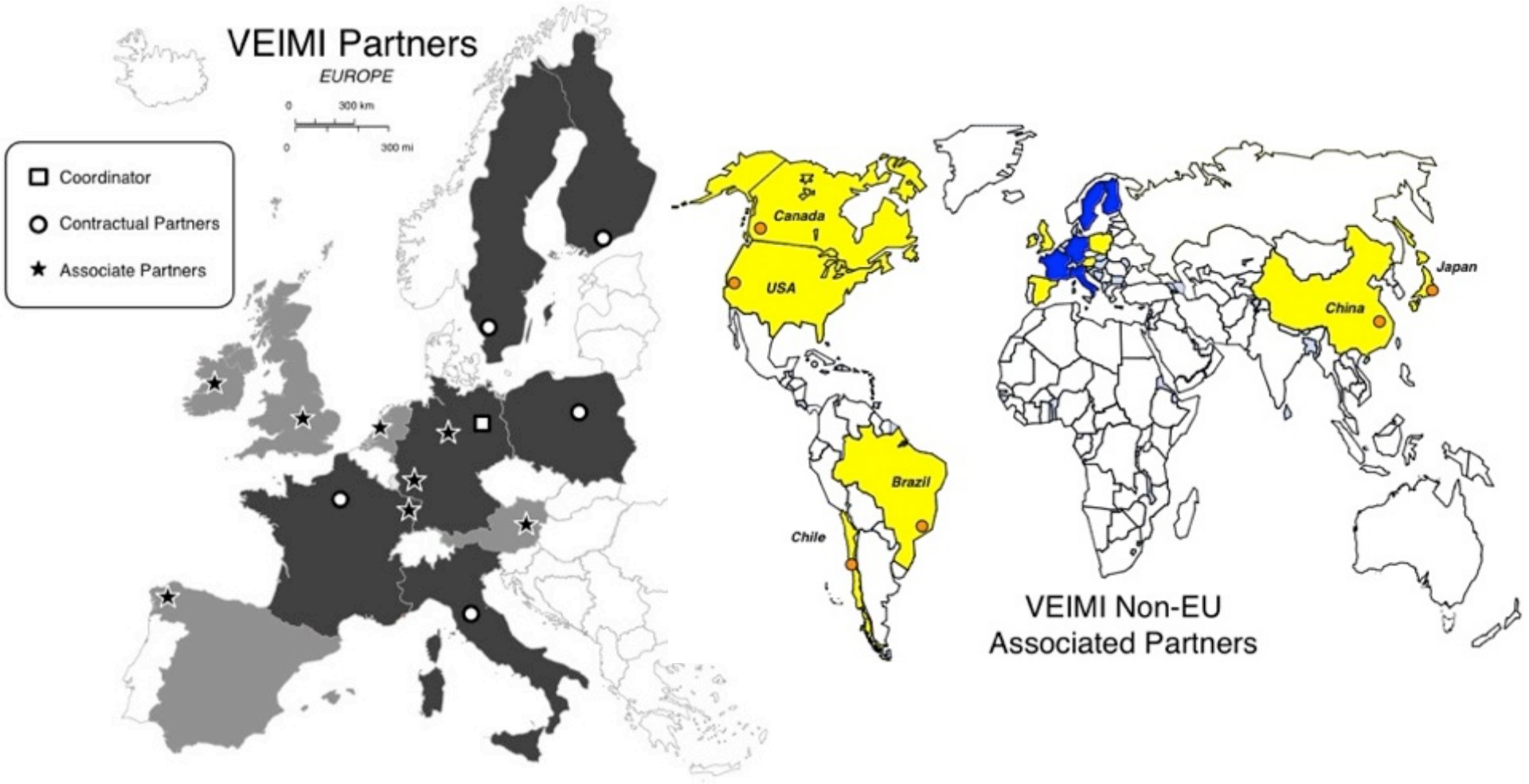
**Mathematical Societies and academic institutions should create common curricula and educational programmes in mathematics at European level taking into account local expertise and specificity.**

# EC Proposal for a design study for a European Infrastructure of Mathematics for Innovation




Duration: 2012-2016
Budget: 1.8 m€

# VEIMI partners



# VEIMI non-EU Partners

| | | |
|---|---|---|
| NON-EU | CeMEAI - Centre for Mathematics and Statistics Applied to Industry | Brazil |
| NON-EU | CMM - Centro de Modelamiento Matematico | Chile |
| NON-EU | IMA - Institute of Mathematics and its Applications | USA |
| NON-EU | Meiji Institute of Mathematical Sciences Tokyo | Japan |
| NON-EU | mprime | Canada |
| NON-EU | School of Mathematical Sciences, Fudan University | China |

- Looking forward a fruitfull collaboration
- The present conference could become a corner stone in the process

***Thank you !***

# www.esf.org

***Join us on***


***pesc@esf.org***