European COoperation in Science and Technology

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Materials, Physical and Nanosciences

Natural Science Cluster

COST Office, Brussels

COST is supported by
the EU RTD Framework Programme

ESF provides the
COST Office through an EC contract

The COST mission

Strengthen Europe in scientific and technological research for peaceful purposes through the support of cooperation and interaction between European researchers

The COST programme, based on an inter-governmental agreement, is a long-running, economical and highly successful way to spread awareness and build networks between Europe's researchers

It reflects the human dimension of science, helping researchers to share not only the results of their work but also their aims and methods

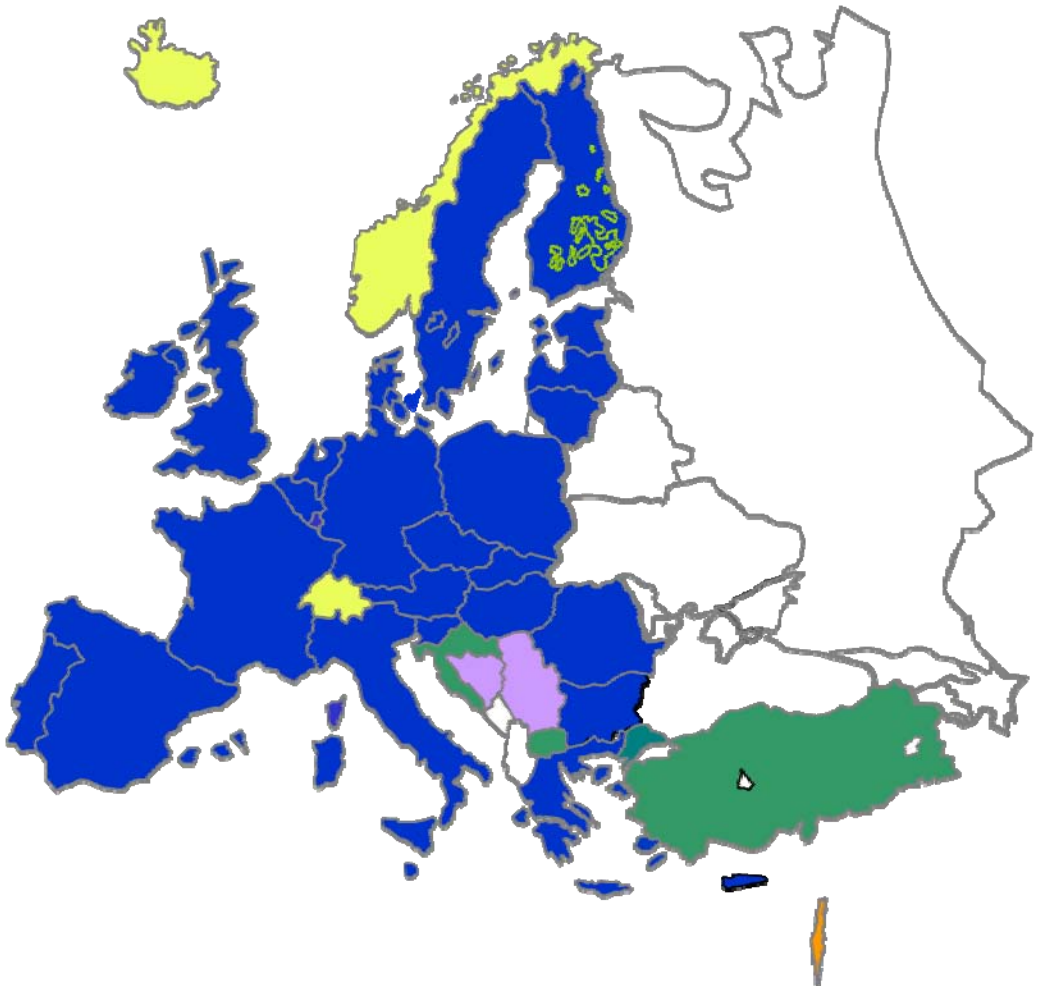
A brief history of COST

- Oldest and widest running European intergovernmental network for cooperation in research in Europe
- **Established** by Ministerial Conference of 19 European States in **1971**, Brussels, as a Framework for coordinating nationally funded research in Europe, pre-dates
  - 1974 European Science Foundation
  - 1983 First Framework Programme
  - 1985 Eureka Programme
- From 19 countries in 1971 to currently **36 COST countries** with 1 cooperating state & International organizations and research institutions from **non-COST countries**
- From 7 Actions in 1971 to almost **250 Actions running,** networked research projects
- From 7 Domains in 1971 to **9 Domains** plus a trans-domain

COST main characteristics

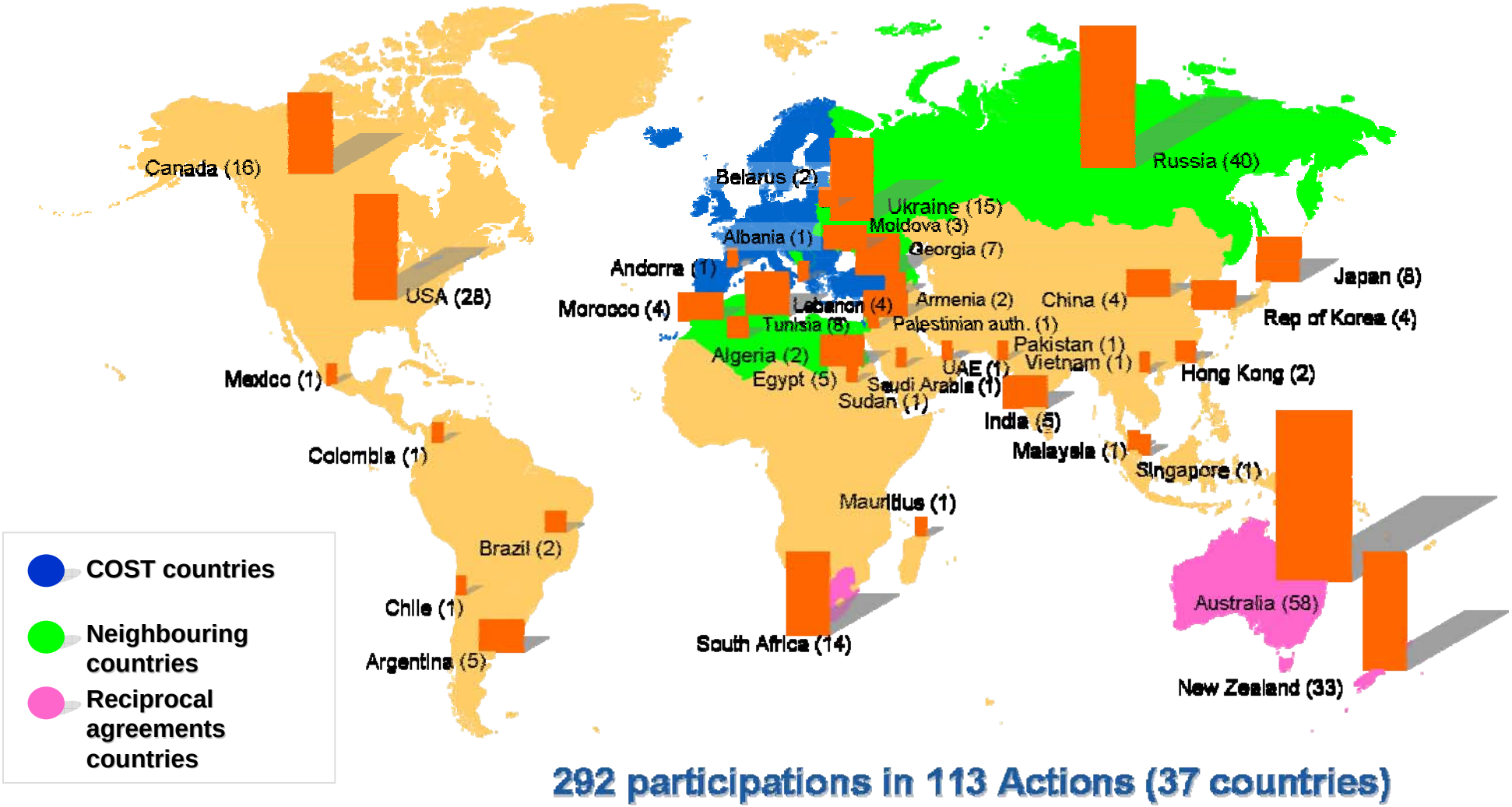
- "**Bottom-up" approach**. The initiative of launching of a COST Action comes from the researchers themselves. Basic & applied research as well as activities of public utility. *No fixed programmes and priorities, equal access via OPEN CALL*
- **Flexible 'á la carte' participation**. Only the countries interested in the Action sign the relevant "Memorandum of Understanding" – MoU. A minimum number of 5 signatures is required.
- Networks based on funded (research) projects – national responsibility
- Multi-disciplinary, 9 Domains plus Trans-Domain
- **Pan-European dimension**, open to global cooperation of mutual interest, bridging research communities, enabling agent
- **Equality of access.** Participation is open also to the scientific communities of countries not belonging to the EU

36 COST Countries & 1 Co-operating State



- **The 27 EU Member States**
- **EFTA Member States**
  - Iceland
  - Norway
  - Switzerland
- **Acceding & Candidate Countries**
  - Croatia
  - FYR of Macedonia
  - Turkey
- **Potential Candidate Countries**
  - Bosnia and Herzegovina
  - Republic of Serbia
- **COST Co-operating States**
  - Israel

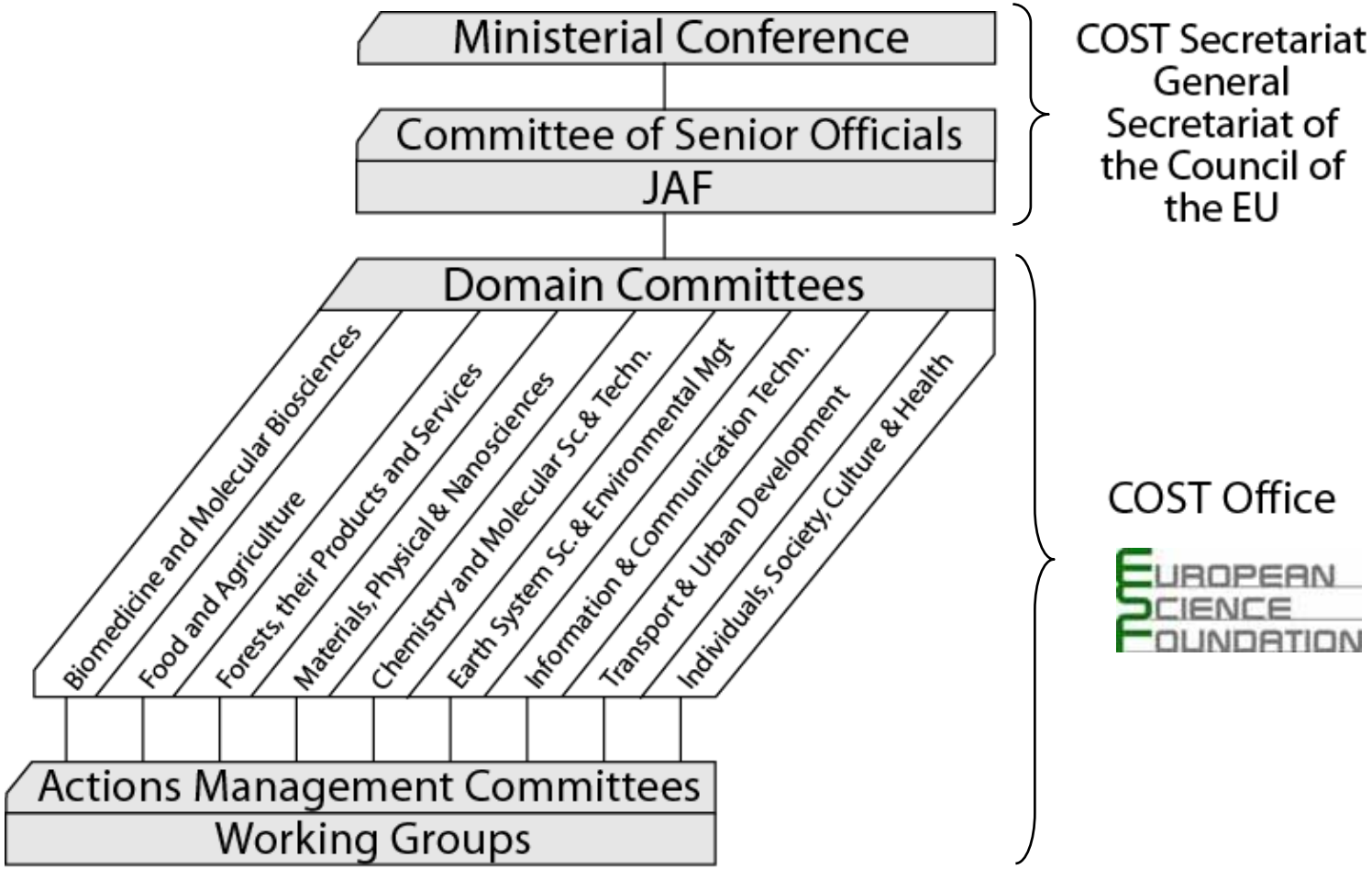
COST Actions: global participation (status: November 2009)



292 participations in 113 Actions (37 countries)

Special budget line in the COST system to facilitate collaborations

COST Governance

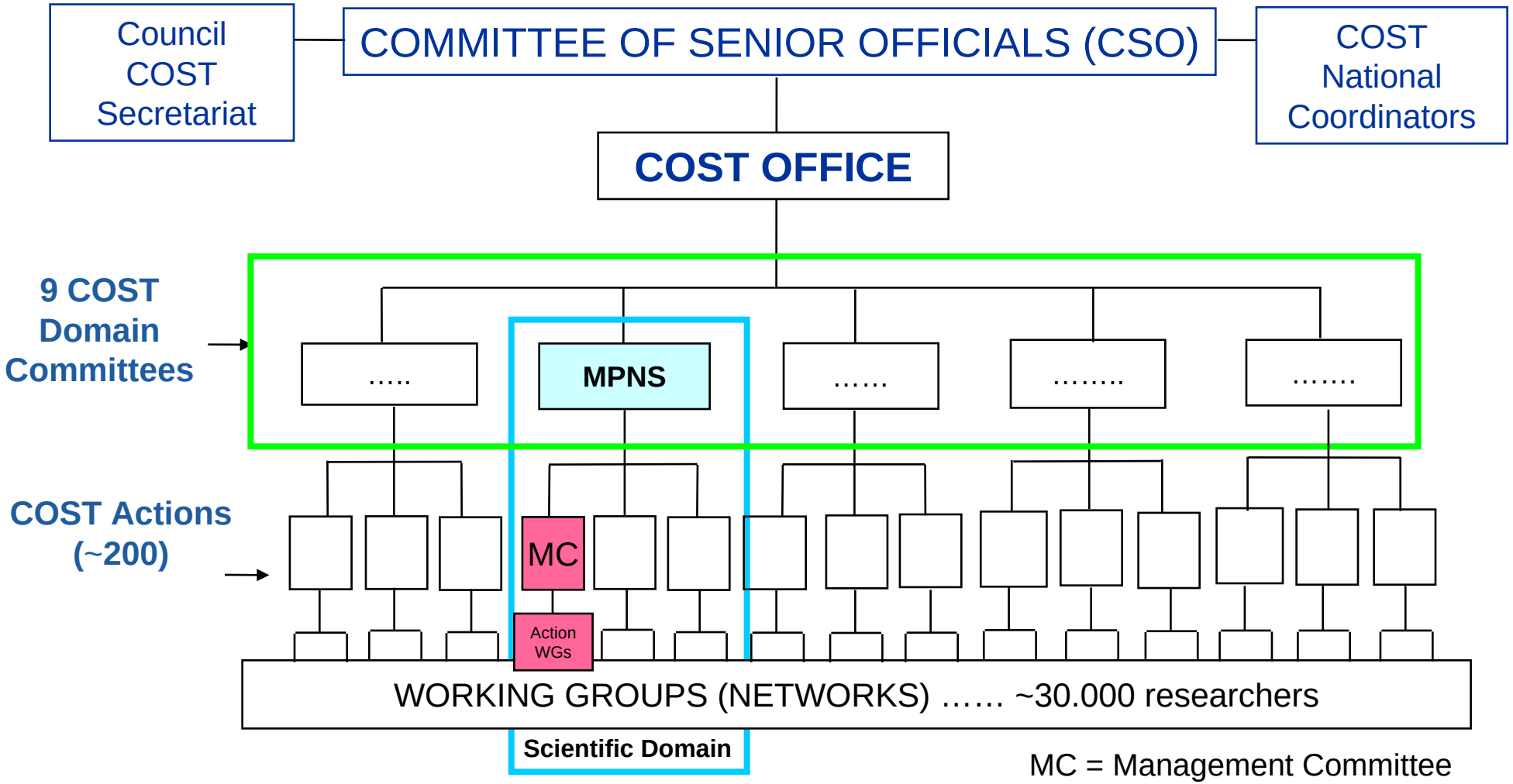


9 Scientific and Technical Domains

- Biomedicine and Molecular Biosciences (BMBS)
- Food and Agriculture (FA)
- Forests, their Products and Services (FPS)
- Materials, Physical and Nanosciences (MPNS)
- Chemistry and Molecular Sciences and Technologies (CMST)
- Earth System Science and Environmental Management (ESSEM)
- Information and Communication Technologies (ICT)
- Transport and Urban Development (TUD)
- Individuals, Society, Culture and Health (ISCH)

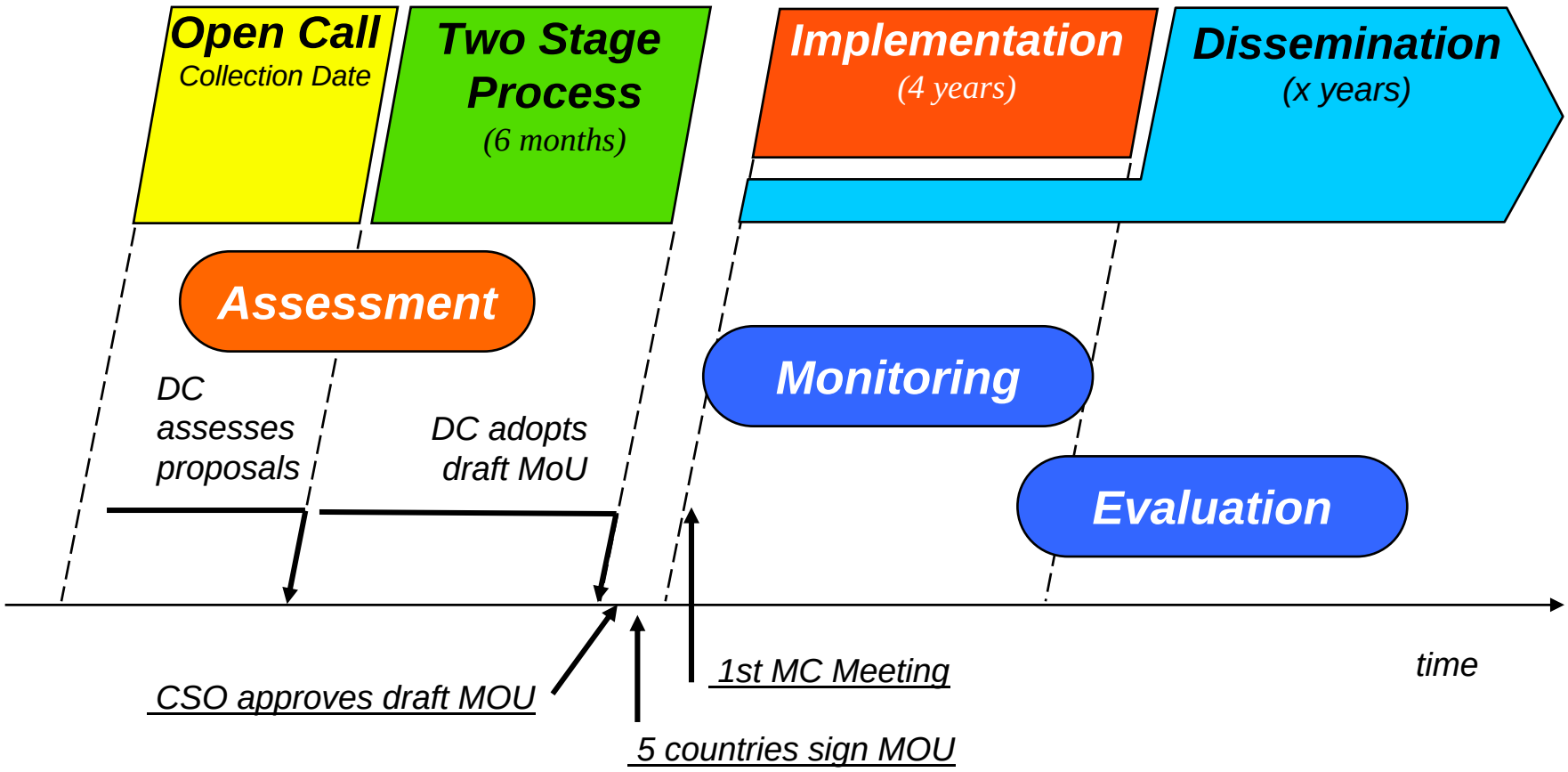
- *Also Trans-Domain Proposals (TDPs)*

What is a COST Action?



MPNS – currently 23 running + 2 standby Actions

COST Action Life Cycle



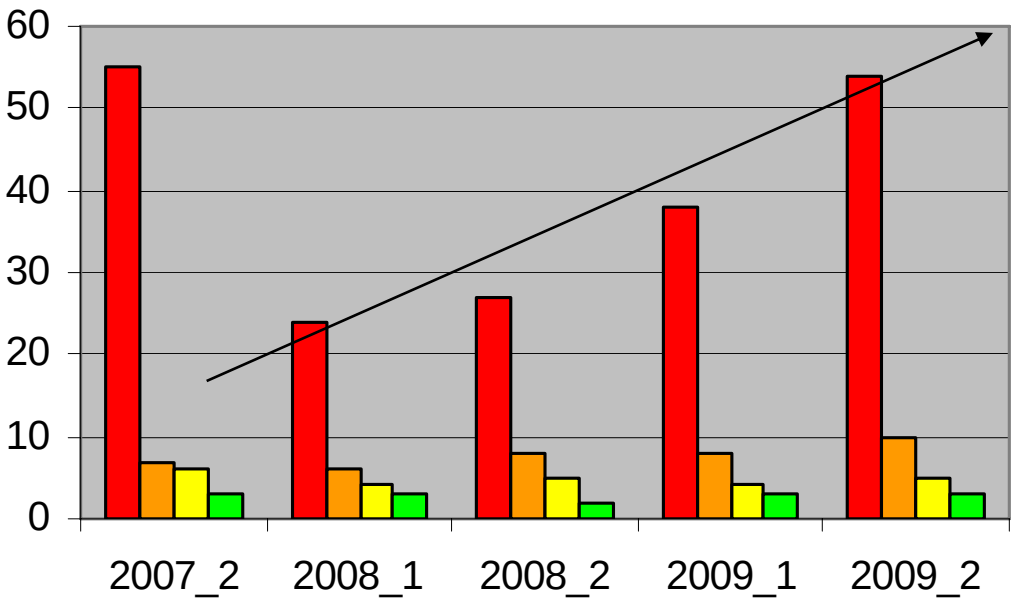
Assessment criteria – Preliminary Proposals

I.1	RIGHT FOR COST? **Is COST the best mechanism for achieving the Action's objectives?** A SCORE OF 2 OR 1 AUTOMATICALLY TRIGGERS LOW SCORES IN THE FOLLOWING CRITERIA	yes no ❒❒❒❒ 4 3 2 1
I.2	SCIENCE **Does the proposed Action address real current problems/ scientific issues?**	yes no ❒❒❒❒ 4 3 2 1
I.3	INNOVATION **Is the proposed Action innovative?**	high low ❒❒❒❒ 4 3 2 1
I.4	IMPACT **Would the proposed network make a significant difference in terms of knowledge, capacity building, social impacts, etc?**	yes no ❒❒❒❒ 4 3 2 1
I.5	PRESENTATION **Is the proposed Action presented in a clear and understandable way?**	yes no ❒❒❒❒ 4 3 2 1

A	**CRITICAL CRITERIA**	
A.1	**IS THIS RIGHT FOR COST NETWORKING OF EUROPEAN NATIONAL RESEARCH TEAMS? Is COST the right funding mechanism for achieving the proposal's objectives?** A SCORE OF 2 OR 1 AUTOMATICALLY TRIGGERS REJECTION	❒❒❒❒ 4 3 2 1
A.2	**IS THE PROPOSAL PRESENTED IN A CLEAR, CONVINCING, AND APPROPRIATE WAY?** A SCORE OF 2 OR 1 AUTOMATICALLY TRIGGERS REJECTION	❒❒❒❒ 4 3 2 1
B	**SCIENCE**	
B.1	**Does the proposed Action address real current problems/scientific issues?**	❒❒❒❒ 4 3 2 1
B.2	Does the proposed Action show awareness of the state-of-the-art of the relevant scientific/ technical fields?	❒❒❒❒ 4 3 2 1
B.3	Is the proposed Action innovative?	❒❒❒❒ 4 3 2 1
C	**IMPACT**	
C.1 A	If the proposed Action aims primarily to meet European economic or societal needs, how likely is it to achieve useful impacts?	❒❒❒❒ 4 3 2 1
C.1 B	If the proposed Action aims primarily to contribute to the development of the scientific or technological field, how likely is it to achieve useful impacts?	❒❒❒❒ 4 3 2 1
C.1 C	If the proposed Action aims BOTH to meet European economic or societal needs, AND to contribute to the development of the scientific or technological field, how likely is it to achieve useful impacts?	❒❒❒❒ 4 3 2 1
C.2	Are there clear plans for stimulating the production of high quality outputs?	❒❒❒❒ 4 3 2 1
C.3	Is attention given to the potential application of results (including, where appropriate, fostering their commercial exploitation)?	❒❒❒❒ 4 3 2 1
D	**STRUCTURE AND ORGANISATION**	
D.1	Are the workplan and organisation appropriate?	❒❒❒❒ 4 3 2 1
D.2	Are the time schedule and the setting of milestones appropriate?	❒❒❒❒ 4 3 2 1
D.3	Are appropriate plans made for monitoring and evaluating the achievement of objectives?	❒❒❒❒ 4 3 2 1
E	**CONTRIBUTION TO WIDER COST GOALS**	
E.1	How well does the proposed Action aim to involve early stage researchers?	❒❒❒❒ 4 3 2 1
E.2	How well does the proposed Action aim at gender balance?	❒❒❒❒ 4 3 2 1
E.3	Will the proposed Action attract interest from a wide range of European countries?	❒❒❒❒ 4 3 2 1

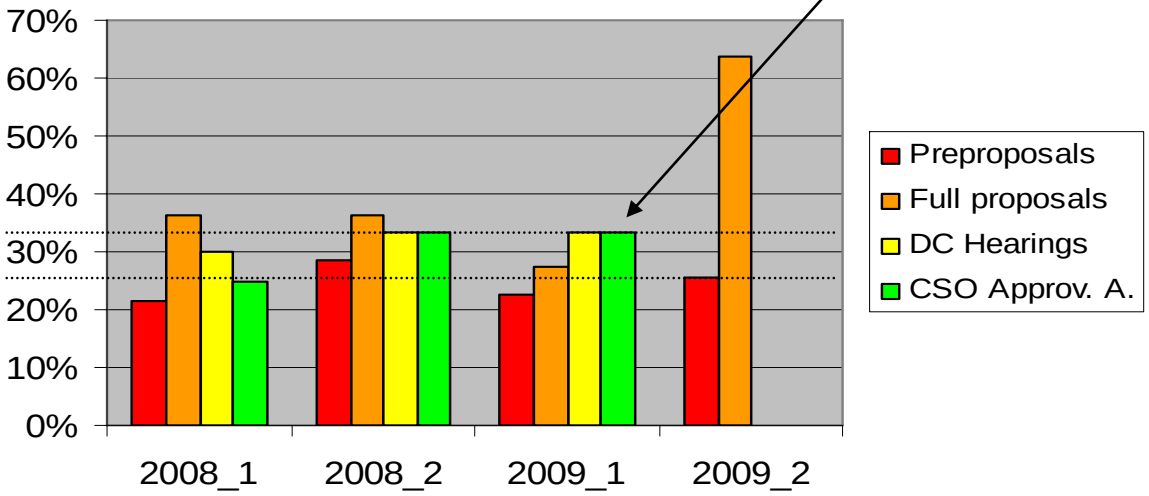
Assessment criteria – Full Proposals

MPNS Proposals in Open Calls



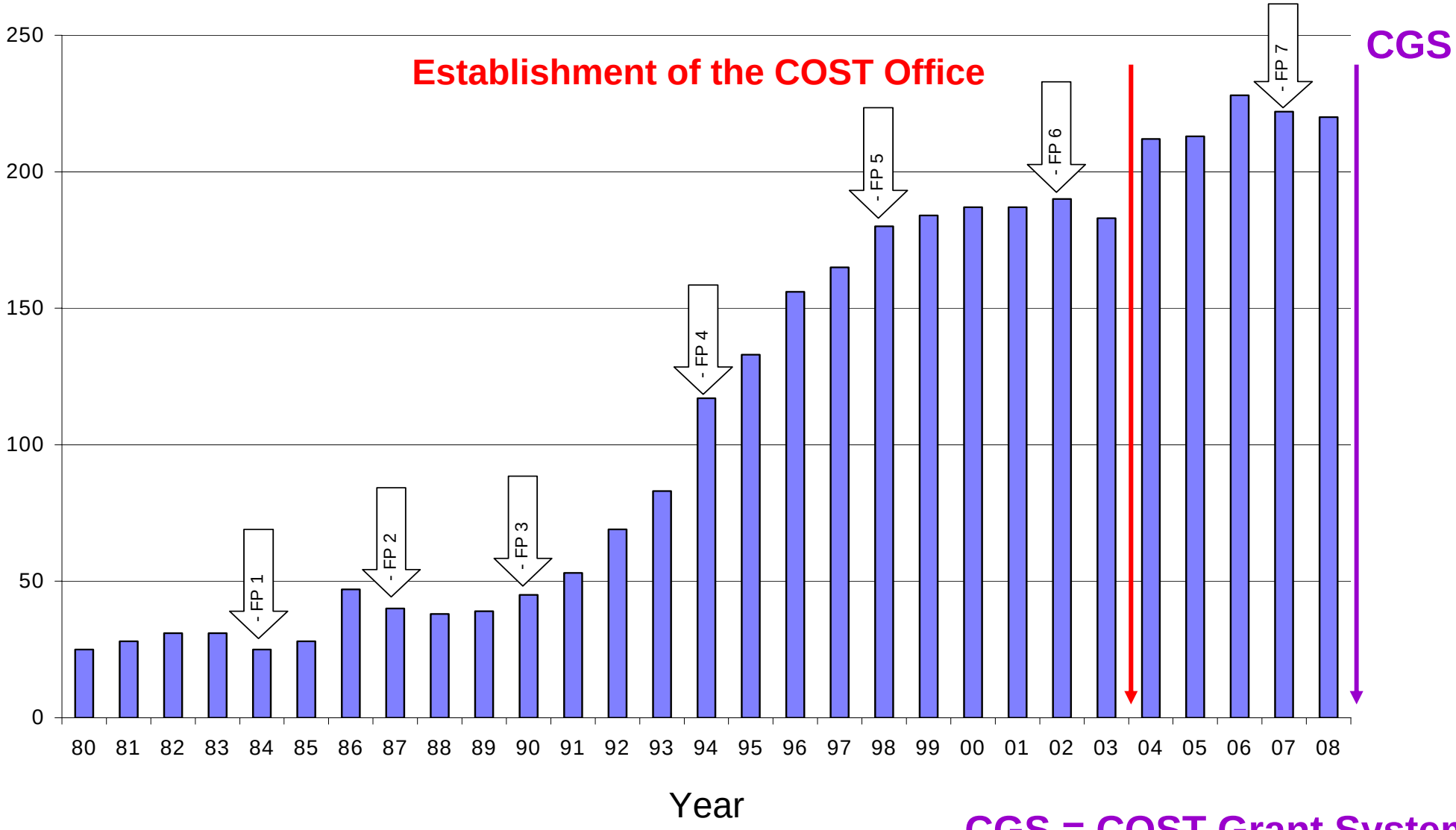
TD0906

MPNS-TDP



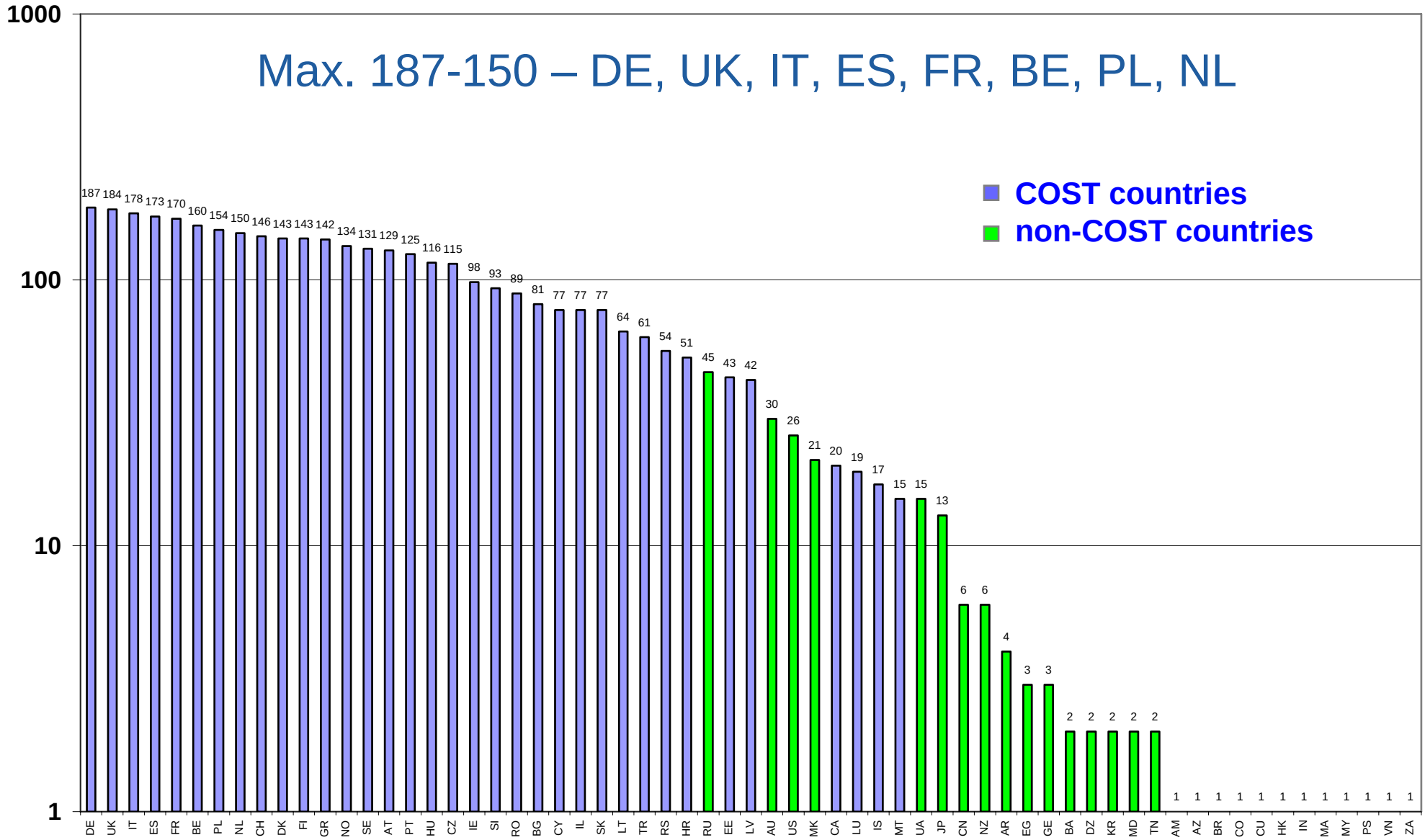
Comparison of performance of MPNS proposers in 5 Open Calls in terms of numbers of applications within the preproposal, full proposal, DC hearings and CSO approved Actions stages of the Open Call

COST Actions – yearly evolution (1980-2008)



CGS = COST Grant System

COST Actions – Participation by country (May 2008)



What is funded by COST?

- COST Actions: A network of (nationally) funded projects (min. 5 participating COST countries) receive a financial contribution based on a joint work programme (4 years) for:
  - Science management / working group meetings
  - Scientific workshops and seminars
  - Short Term Scientific Missions (STSMs)
  - Training Schools and Research Conferences
  - Dissemination and Publications

  Average funding +/- 100 000 € per year per Action

- Exploratory/Strategic Workshops: to explore future scientific or societal needs, support policy developments or stimulate innovative activities

What was funded by in 2009?

- 242 COST Actions
- 900 workshops and meetings (4.3 per working day over the year) with more than 29500 participants
- 1200 STSMs with an average duration of 3 weeks (5.6 STSMs starting every working day over the year)
- 90 Training Schools with more than 2000 funded participants
- 100 publications

COST Exploratory Workshop on Physics of Amorphous Solids: Mechanical Properties and Plasticity

14-19 March 2010, Les Houches, France

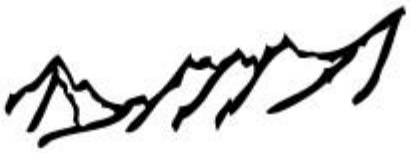
Organizing Committee

Anaël Lemaître
Laboratoire Navier,
Université Paris-Est, FR

Itamar Procaccia
The Weizmann Intitute of Science, IL

Caroline M. Whelan
COST, BE

ÉCOLE DE PHYSIQUE des HOUCHES

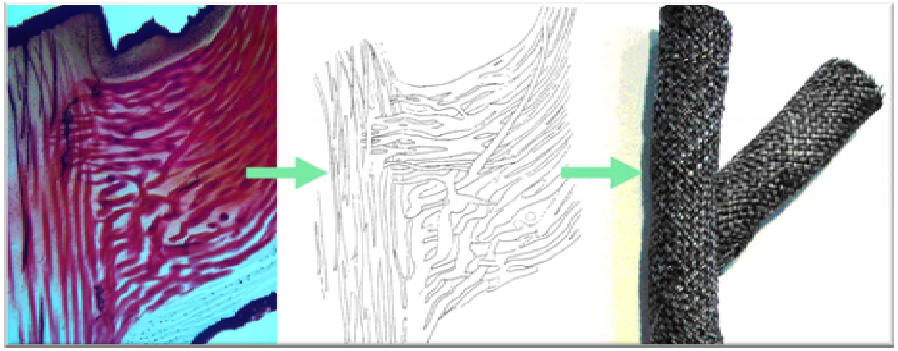


UNIVERSITE JOSEPH FOURIER SCIENCES TECHNOLOGIE MEDECINE

The objective of the workshop is to review state-of-the-art research in the fundamental physics of amorphous solids. The event will also look at the mechanical response of amorphous solids to large deformations, including homogeneous yielding via the elasto-plastic transition and flow localisation.

More Information
http://www.cost.esf.org/events/Physics-of-Amorphous-Solids
http://www.weizmann.ac.il/conferences/LesHouches/home.html

Principles and Development of Bio-Inspired Materials 13-15 April 2010, Vienna, Austria



The aim of the **COST Strategic Workshop** is to provide a forum to stimulate interactions between relevant disciplines including biology, materials science, biomimetics, engineering and physics.

The Workshop will be organised along three main themes:

- Material Design Strategies of Nature
- Implementation of Biological Concepts (Abstraction and Translation)
- Applications

More Information

www.cost.esf.org/events/biomat

www.map.boku.ac.at/workshopBIOMAT.html

Workshop Chair

Stefanie Tschegg
University of Natural Resources and Applied Life Sciences Vienna, BOKU, AT

Co-Chair

Robin Seidel
University of Freiburg, DE

Steering Committee

Francesca Cosmi
Università di Trieste, IT

Rainer Erb
BIOKON, DE

George Jeronimidis
University of Reading, UK

Julián Martínez Fernández
Universidad de Sevilla, ES

Thomas Rosenau
BOKU, AT

Lennart Salmen
STFI, SE

Thomas Speck
University of Freiburg, DE

Sybrand van der Zwaag
Delft University of Technology, NL

Network or perish: A gender perspective on access to project funding and management

Panel discussion, followed by interactive round tables on the following themes:

- Identifying how to enhance a proactive participation of women in funded research projects
- Exploring the relation between women scientists' participation in research funding and the importance of networking
- Discussing the role of networking during the preparation stages of applications as well as throughout the project phase, e.g. regards the distribution of project tasks and in reaching positions in

Chair
Caroline Whelan
COST Office, BE

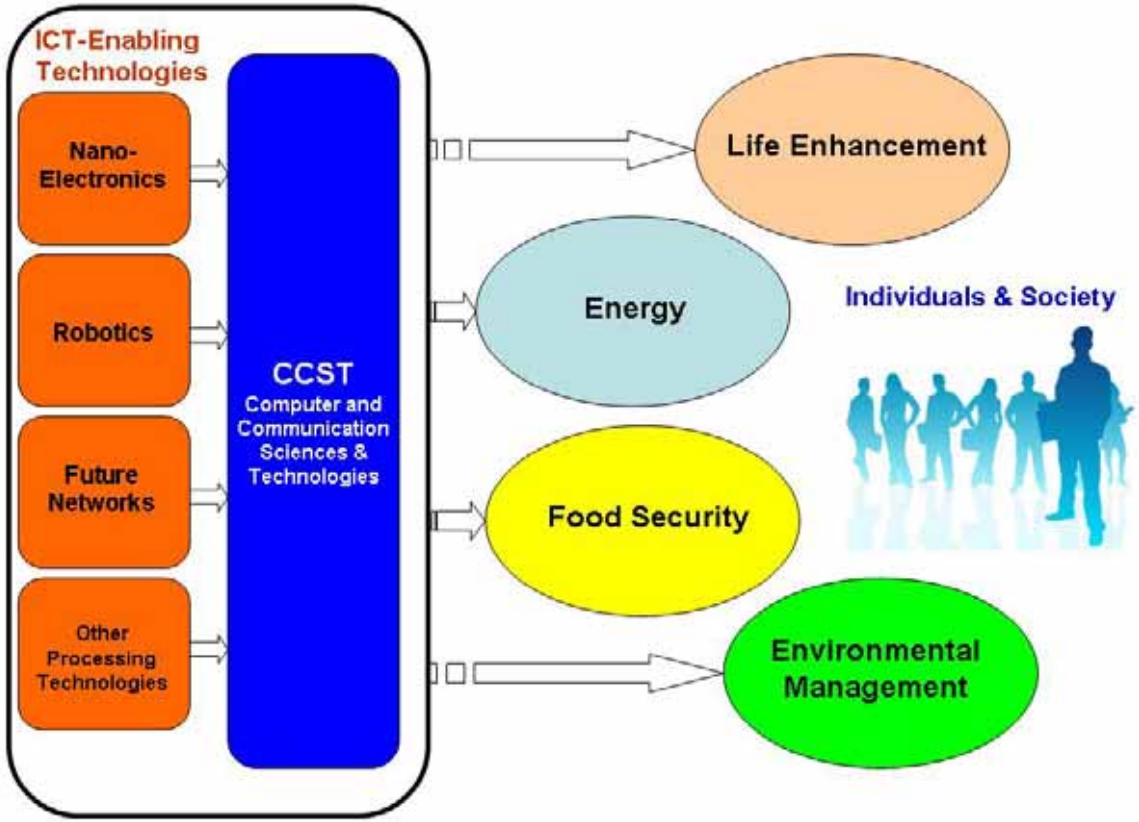
Moderator
Heather K. J. van der Lely
Department of Psychology, Harvard University, Vice-Chair COST Action A33, USA

Panellists
Martin Grabert
COST Office, BE
Maren Jochimsen
EPWS, BE
Britta Thomsen
Group of the Progressive Alliance of Socialists and Democrats in the European Parliament, DK
Luisa Prista
European Commission, DG Research, BE

epws

More Information
www.cost.esf.org/events

Harnessing the Digital Revolution
Foresight 2030



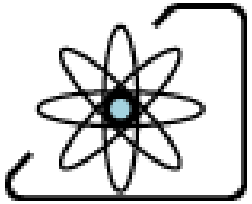
- **COST Strategic Workshops**
- Explore a broadly-shared vision for a future world beyond 2030 permeated and shaped by the Digital Revolution
- Series of events presenting long-term perspectives in the following selected fields:
  - **Computer and Communication Sciences and Technologies** (CCST),
  - **Life Enhancement**, **Energy**, **Food Security**, **Natural Resources Management** and
  - ***Organization of European Society***

More Information
http://www.cost.esf.org/events/foresight_2030_ccst-ict

COST in FP7: Highlights

- **Early stage researchers (i.e. PhD + <10 years)**
  - **Open Call participation**
  - **Increased duration of Short Term Scientific Missions (STSMs)**
  - **More Training schools**
  - **Increased involvement in existing COST Activities:**
    - **Outreach and profiling**
    - **Pilot schemes (e.g. Australia and New Zealand)**
- **Joint activities**
  - **High Level Research Conference (COST-ESF)**
  - **Frontiers of Science Workshops (COST-ESF)**
  - **Strategic Workshops and Science Initiatives**
  - **Outreach Activities (e.g. ESOF2008)**

COST-MPNS Domain



Materials, Physical and Nanosciences

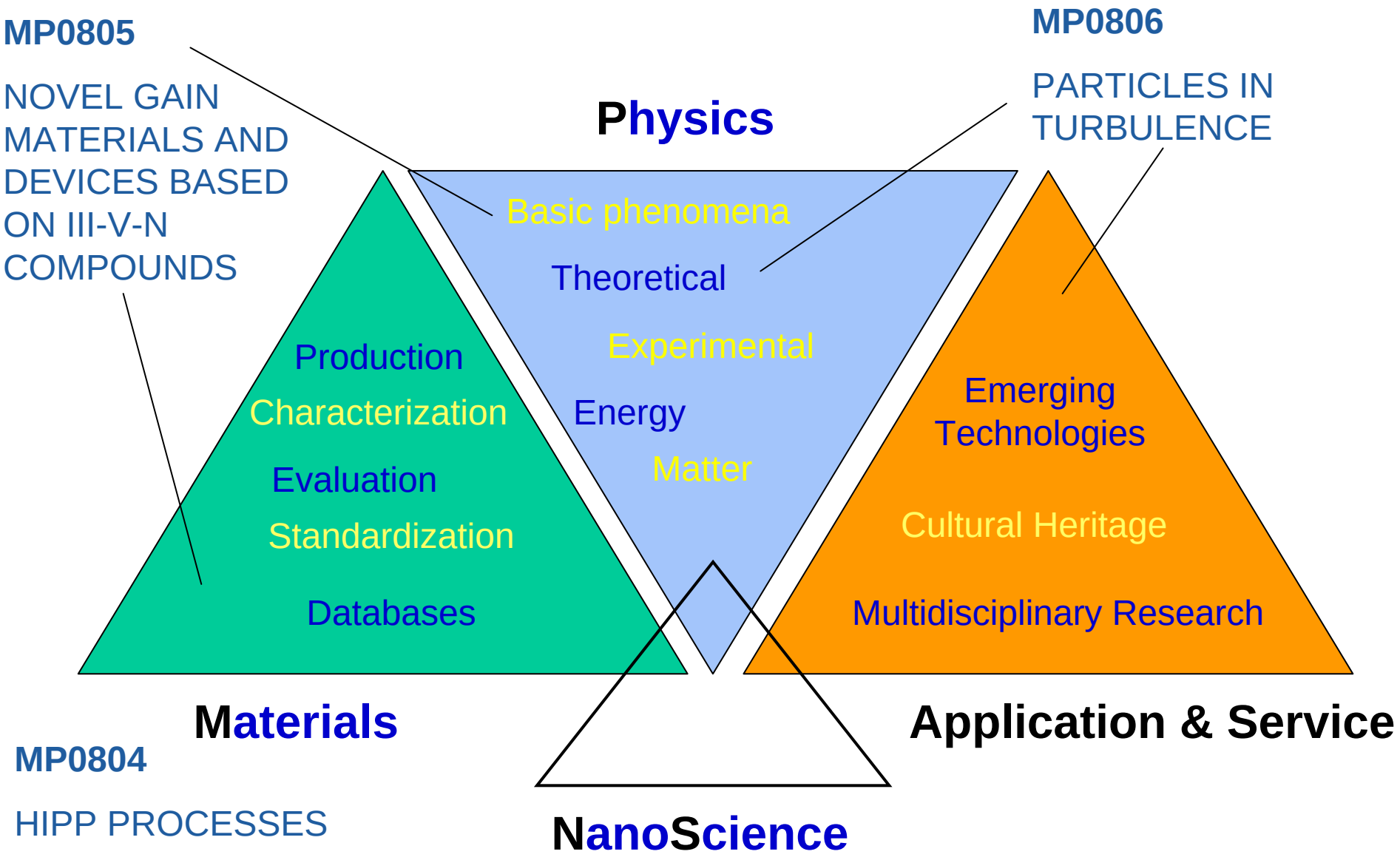
Domain Committee Chair:
Prof. Eva OLSSON

Domain Committee Vice-Chair:
Dr. Anthony FLAMBARD

Domain Science Officer:
Dr. Caroline WHELAN

Natural Science Cluster Junior SO
Dr. Lucia FORZI

MPNS Domain – Thematic Areas and New Actions



Running MPNS Actions

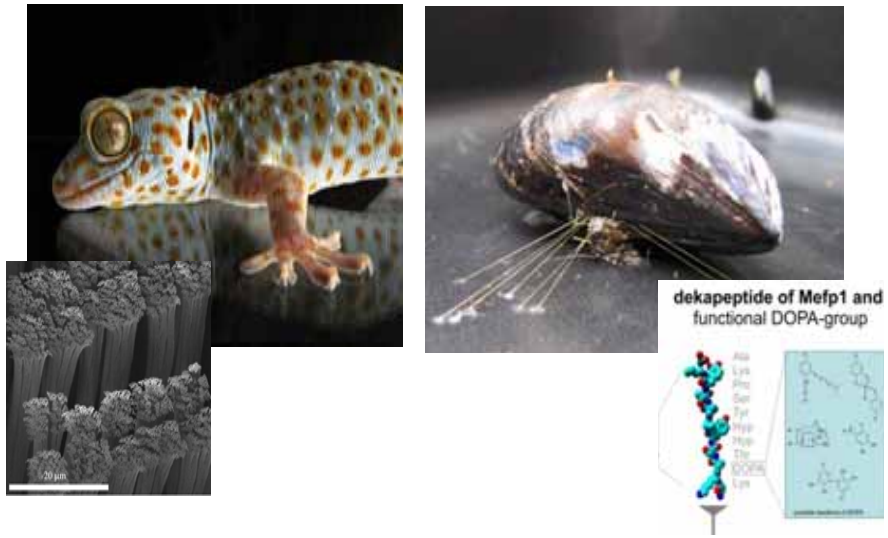
1. 540 Photocatalytic Technologies and Novel Nanosurfaces Materials – Critical Issues (“PHONASUM”) (End date: January 2010)
2. 541 Semi-solid Processing of Steels: Thixosteel (End date: July 2010)
3. 542 High Performance Energy Storages for Mobile and Stationary Applications: HPSMT (End date: July 2010)
4. 543 Research and Development of Bioethanol Processing for Fuel Cells (BIOETHANOL) (End date: October 2010)
5. P19 Multiscale Modeling of Materials (End date: February 2010)
6. P20 Large-Eddy Simulation for Advanced Industrial Design (“LES-AID”) (End date: February 2010)
7. P21 Physics of Droplets (End date: October 2010) IE0601 Wood Science for Conservation of Cultural Heritage (WoodCultHer) (End date: April 2011)
8. MP0601 Short Wavelength Laboratory Sources (End date: April 2011)

9. MP0602 Advanced Solder Materials for High Temperature Application (HISOLD) (End date: May 2011)
10. MP0603 Chemical Imaging by Means of CARS-microscopy (MicroCARS) (End date: April 2011)
11. MP0604 Optical Micro-Manipulation by Nonlinear Nanophotonics (End date: May 2011)
12. MP0701 Composites with Novel Functional and Structural Properties by Nanoscale Materials (Nano Composite Materials-NCM) (End date: March 2012)
13. MP0702 Towards Functional Sub-Wavelength Photonic Structures (End date: January 2012)
14. MP0801 Physics of Competition and Conflicts (End date: June 2012)
15. MP0802 Self-assembled Guanosine Structures for Molecular Electronic Devices (End date: June 2012)
16. MP0803 Plasmonic Components and Devices (End date: June 2012)
17. MP0804 Highly Ionised Pulse Plasma Processes (End date: 25 June 2013)

18. MP0805 Novel Gain Materials and Devices Based on III-V-N Compounds (End date: November 2012)
19. MP0806 Particles in turbulence (End date: November 2012
20. MP0901 Designing Novel Materials for Nanodevices - from Theory to Practice (NanoTP) (End date: May 2013)
21. MP0902 Composites of Inorganic Nanotubes and Polymers (COINAPO) (End date: May 2013)
22. *MP0904 | SIMUFER: Single- and Multiphase Ferroics and Multiferroics with Restricted Geometries (End date: March 2014)*
23. *MP0905 | Black Holes (BH) in a Violent Universe (End date: March 2014)*
24. *MP0903 | NANOALLOY – Nanoalloys as Advanced Materials: From Structure to Properties and Applications (End date: May 2014)*
25. ***TD0906 | Biological Adhesives: From Biology to Biomimetics (End date: May 2014)***

COST Action TD0906 (MPNS, **BMBS, CMST)**
Biological adhesives: from biology to biomimetics

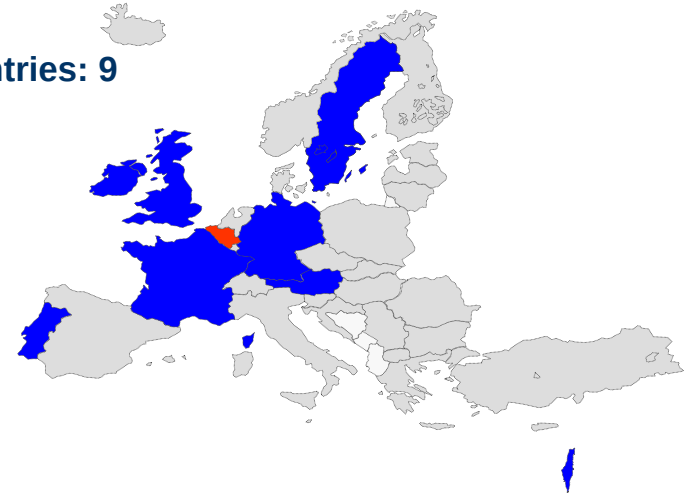
- Objectives
- To gain new understanding relating to the mode of action of biological adhesives so as to facilitate the development of synthetic counterparts with improved function.



Interested Countries: 9

Proposer: BE

AT, FR, DE, IE, IL, PT, SE, UK

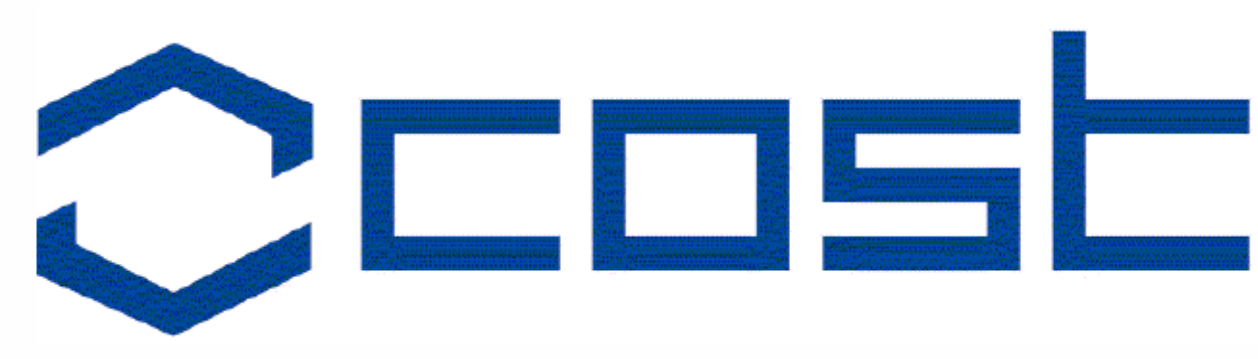


WG1	Chemical characterization and synthesis of adhesives
WG2	Structural characterization of natural and synthetic adhesives
WG3	Mechanical testing and theory
WG4	Fabrication of biomimetic adhesives and their evaluation

Thanks to Steering committee

& COST-ESF Conference Unit

Thank you for your attention



www.cost.eu

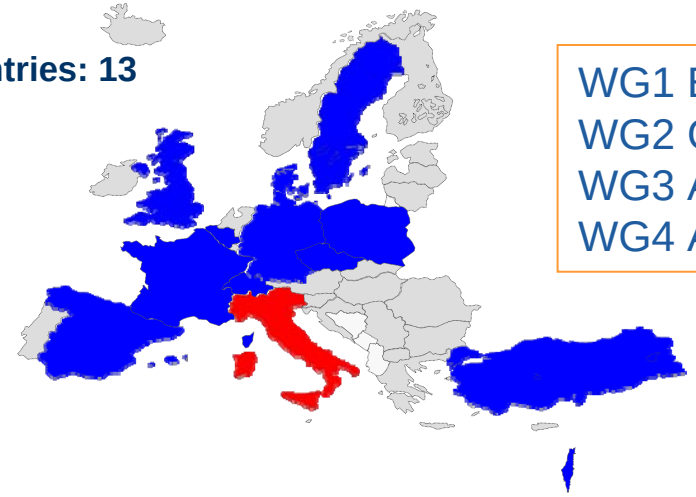
MP0903 **NANOALLOY – Nanoalloys as advanced materials: from structure to properties and applications**

- Objectives
- Increase knowledge and understanding in bi- and multi-metallic nanoparticles (nanoalloys)
- To develop combined experimental/computational methodologies for designing nanoparticles with specific structures, properties and functions
- To contribute to the determination of phase diagrams of nanoalloys, to the development of controlled growth/synthesis protocols, and to the determination of catalytic, magnetic and optical properties of the nanoalloys of major interest in applications

Interested Countries: 13

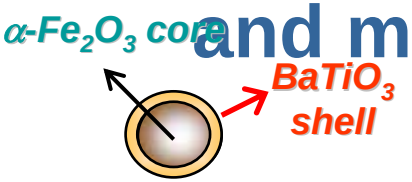
Proposer: IT

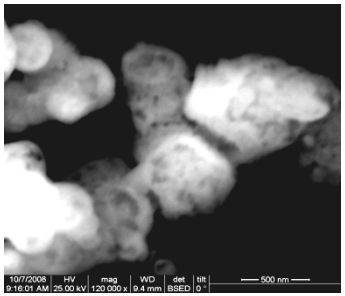
BE, CH, CZ,
DE, DK, ES,
FR, IL, PL, SE,
TR, UK

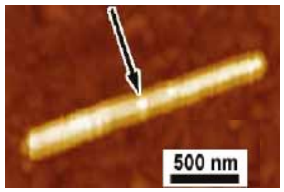


WG1 Equilibrium properties and nanoalloy phase diagrams
WG2 Growth/synthesis of nanoalloys
WG3 Applications to catalysis
WG4 Applications to magnetism and optics

MP0904 **SIMUFER: Single- and multiphase ferroics and multiferroics with restricted geometries**





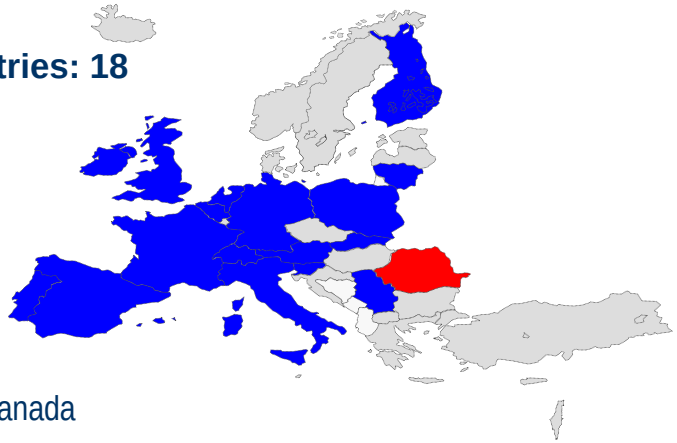


- Objectives
- To organize a multidisciplinary European scientific network of groups experienced in **synthesis**, advanced **characterization** and **modelling** of single-and multi-phase ferroic and multiferroic nanosystems

Interested Countries: 18

Proposer: RO

AT, BE, FI, FR, DE, IE, IT, LT, NL, PL, PT, RS, SK, SI, ES, CH, UK



Non-COST: Brazil, Canada

WG1	Novel ferroic nanostructures
WG2	Single-phase multiferroics
WG3	Ferroic-based composites
WG4	Early stage researchers group

MP0905 **Black Holes (BH) in a Violent Universe**

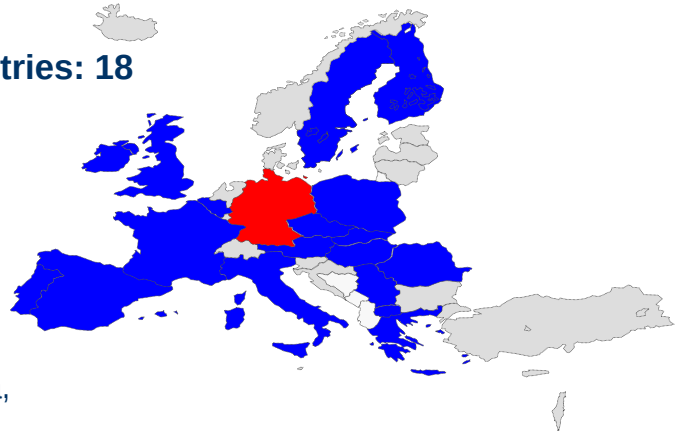
- Objectives
- To enhance the understanding of the BH-phenomenon and its impact on the evolution of our Universe
- To study the fundamental laws of nature using an multi-disciplinary and multi-dimensional approach of BH research
- To use BHs as laboratories to test new physical concepts

Interested Countries: 18

Proposer: DE

AT, BE, CZ, ES, FI, FR, GR, HU, IE, IT, PL, PT, RO, RS, SI, SE, UK

Non-COST: Australia, Georgia, Lebanon, Russia, South Africa



WG1	Quantum Black Holes
WG2	Stellar Black Holes & Pulsars
WG3	The Galactic Centre
WG4	Supermassive Black Holes