



Growing
ideas
through
networks

Use of COST networking tools to achieve the objectives of a COST Action, enhance its impact, and maximize the benefits of its Members – challenges and lessons learnt in COST Action TU1208

Presenter: Lara Pajewski (MC Chair of COST Action TU1208)

Authors: Aleksandar Ristic, Lara Pajewski, Miro Govedarica, and Milan Vrtunski



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EGU Sharing Geoscience Online 2020 (4-8 May 2020) – Session « COST Actions in geosciences »

Talk Layout

- COST Action TU1208: Basic info, main objective, participants and structure of the Action
- Examples of TU1208 open science deliverables
- Use of COST networking tools in COST Action TU1208
- Network of collaborations
- Acknowledgements

**COST Action TU1208:
Basic information,
primary objective,
participants and structure**

TU1208 Basic Information

“Civil Engineering Applications of Ground Penetrating Radar”

- **Chair of the Action & GH Rep.**

Dr Lara Pajewski

“Sapienza” University (IT)

lara.pajewski@uniroma1.it

- **Science & Administrative Officers**

Dr Mickael Pero & Ms Carmencita Malimban

COST Association (BE)

- **Start date – End date**

4th April 2013 – 3rd October 2017

- **Website & social media**

www.GPRadar.eu

www.cost.eu/COST_Actions/tud/TU1208

www.facebook.com/COSTActionTu1208/

www.linkedin.com/company/9425227/

www.instagram.com/costactiontu1208/

www.twitter.com/TU1208GPR



TU1208 Main Objective

Exchange and increase scientific-technical knowledge and experience of GPR techniques in civil engineering, while promoting in Europe a wide and effective use of this safe and non-destructive inspection method.

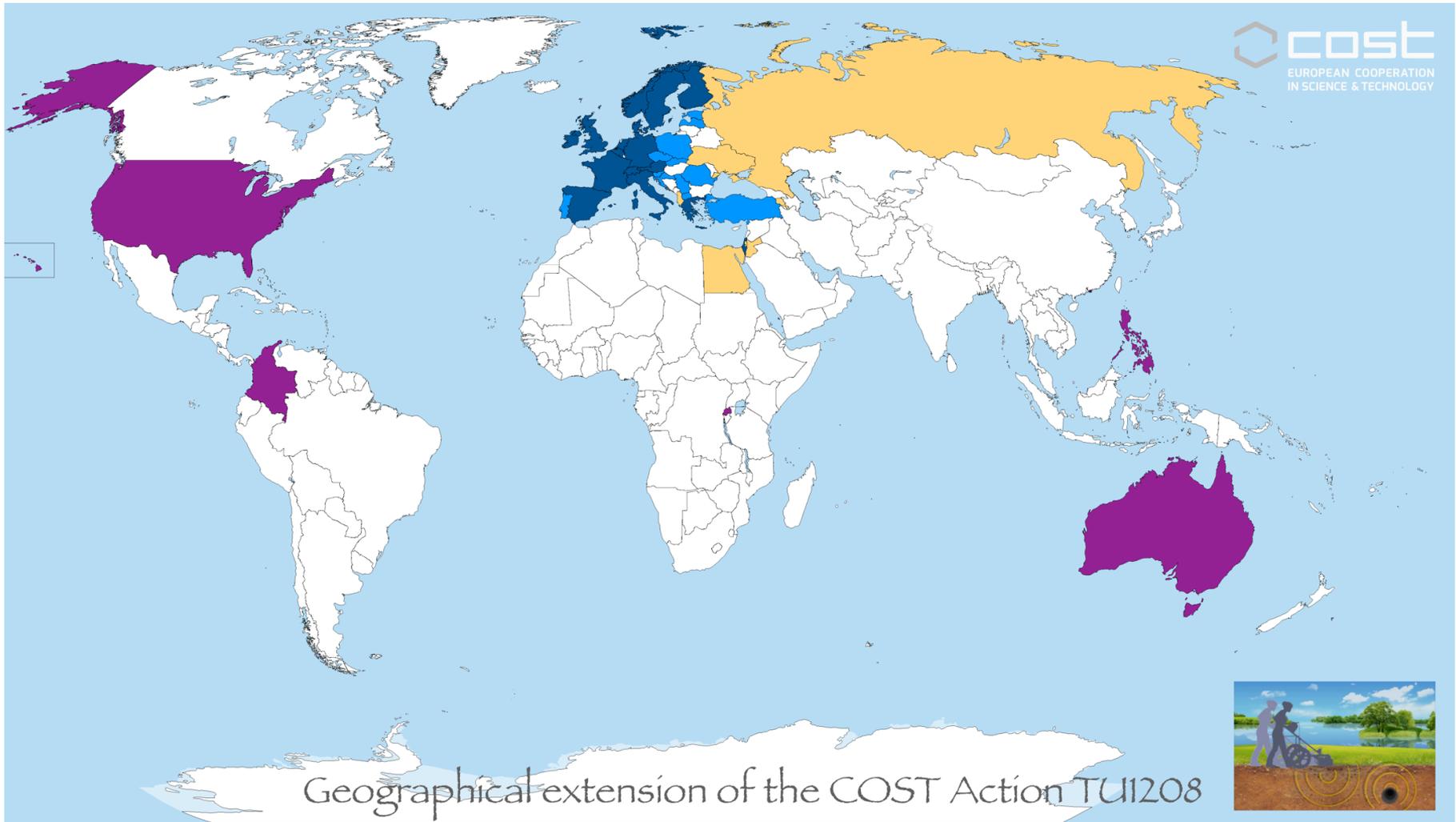
By exploiting all COST networking tools and following COST's inclusiveness policy and key principles, the primary objective of the Action was fully achieved.

The Action created a wide, pan-European, interdisciplinary network, which generated and shared useful knowledge while building a critical mass of people with experience and competences in the GPR field.

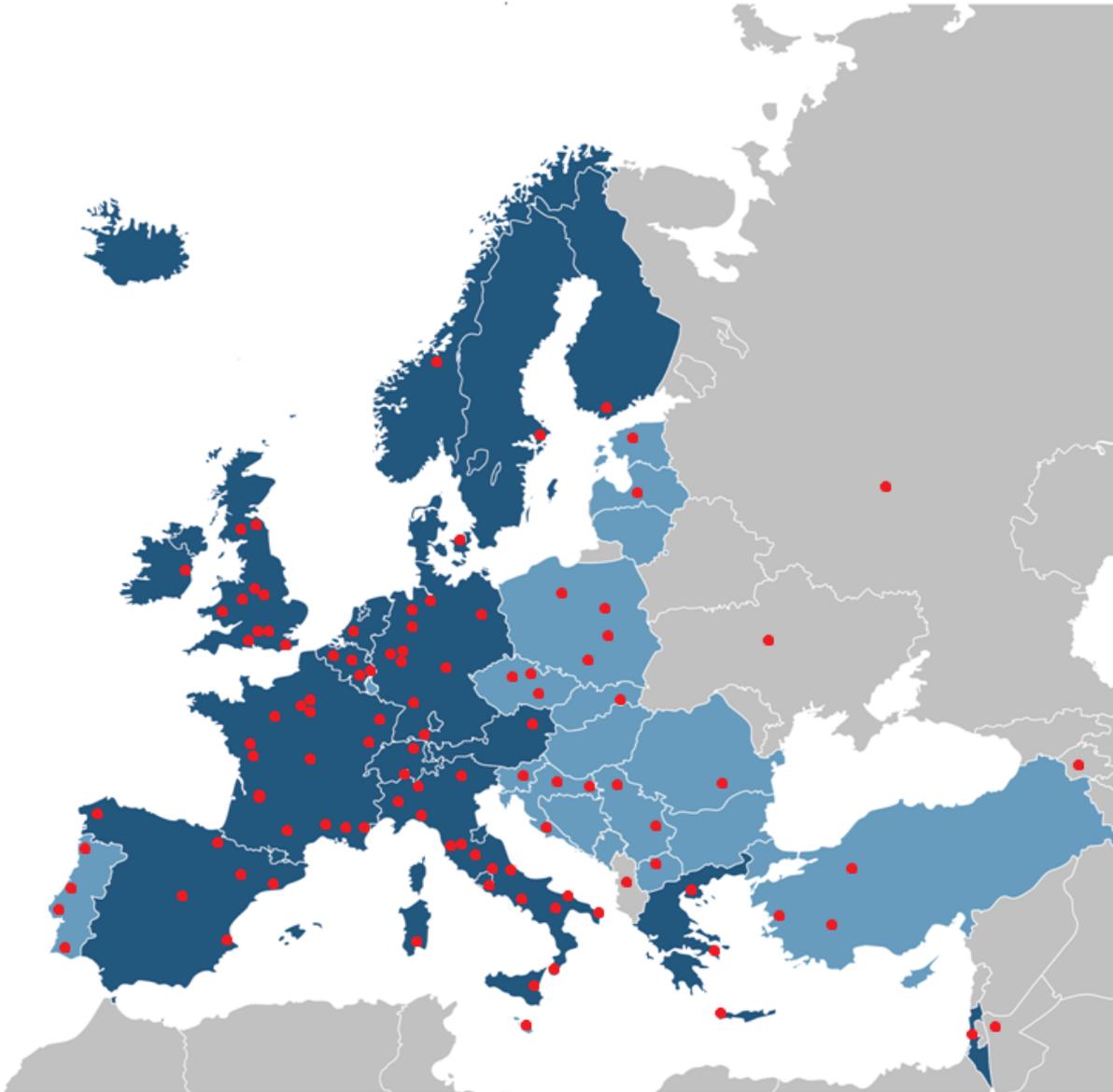
The Action established and strengthened active links between universities, research institutes, and companies working in this field, fostering and accelerating its long-term development in Europe.

TU1208 Participants: 41 Countries

Austria, Belgium, Croatia, Czech Rep., Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Macedonia, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom. Israel. **Albania, Armenia, Egypt, Jordan, Russia, Ukraine.** **Australia, Colombia, Hong Kong, Philippines, Rwanda, USA.**



TU1208 Participants: COST & NNC cities



Austria,
Belgium,
Croatia,
Czech Rep.,
Denmark,
Estonia,
Finland,
France,
fYR Macedonia,
Germany,
Greece,
Ireland,
Italy,
Latvia,
Malta,
Netherlands,
Norway,
Poland,
Portugal,

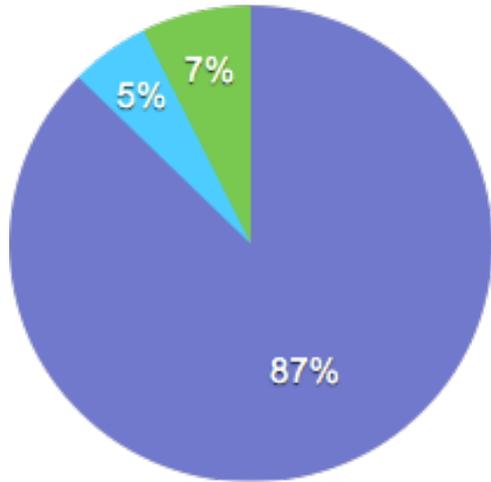
Romania,
Serbia,
Slovakia,
Slovenia,
Spain,
Sweden,
Switzerland,
Turkey,
UK.

Israel

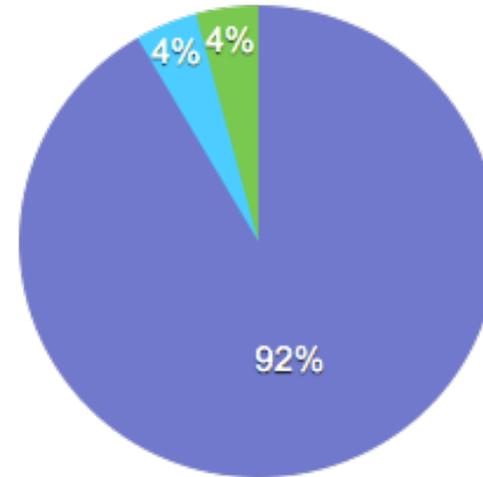
Albania,
Armenia,
Egypt,
Jordan,
Russia,
Ukraine.

TU1208 Participants

TU1208 Institutes: 150

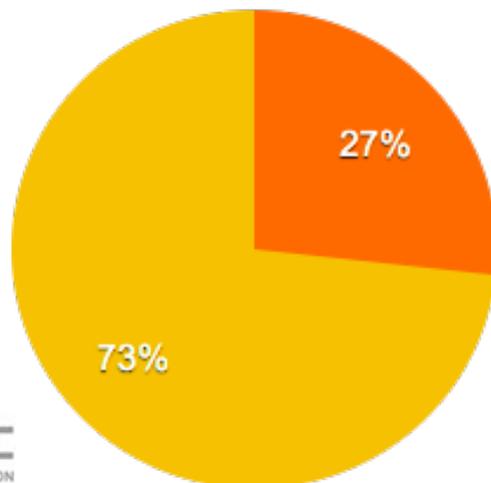


TU1208 Members: 308

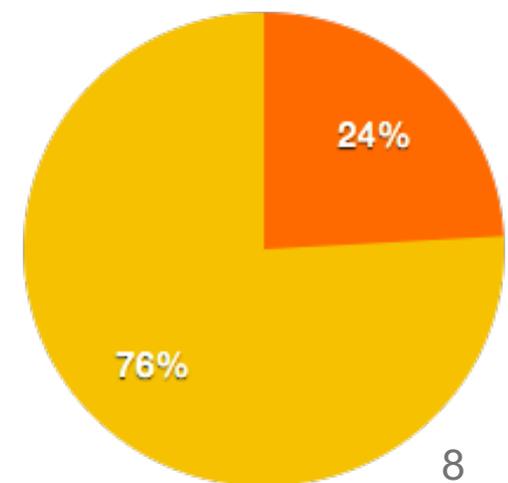


- COST Countries
- NNC
- IPC

COST TU1208 Institutes

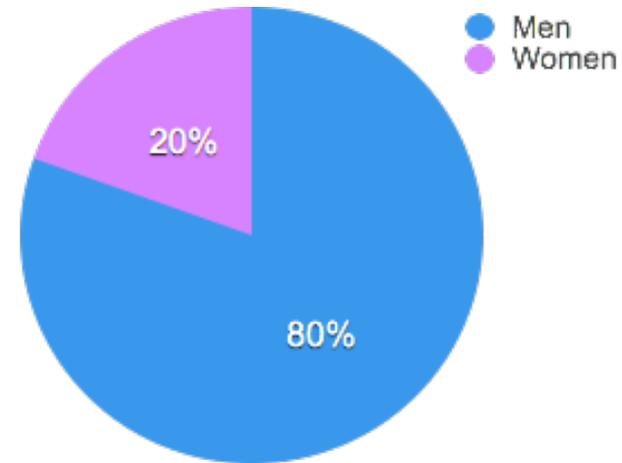
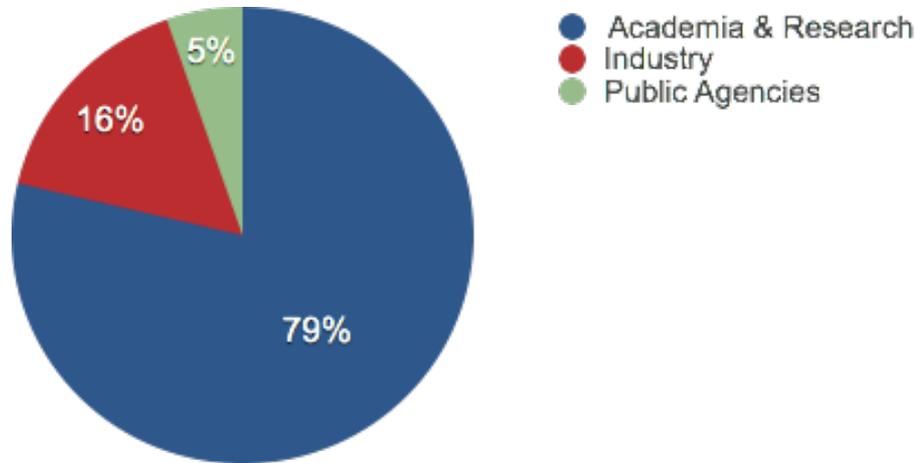


COST TU1208 Members



- Inclusiveness
- Research-intensive

TU1208 Participants



- Researchers from different scientific disciplines (civil and electronic engineers, architects, geophysics experts, archaeologists, ...)
- NDT equipment designers and producers
- End users from private companies
- Experts from public agencies

High level of inter-disciplinarity with a huge potential to provide technological, scientific and socio-economic impact

TU1208 Structure

GRANT HOLDER*
Roma Tre University
Sapienza Innovazione

**MANAGEMENT
COMMITTEE (MC):**
77 MC M & Subs + 24 MC Obs

MC CHAIR:
Dr Lara Pajewski

COST ASSOCIATION

SCIENCE OFFICER:
Dr Mickael Pero

ADMINISTRATIVE OFFICER:
Ms Carmencita Malimban

308 WG Members from 150 institutes

WG 1
Novel GPR
Instrumentation

WG 2
GPR surveying of
roads, bridges,
railways, tunnels,...

WG 3
EM modelling,
inversion, imaging,
data processing

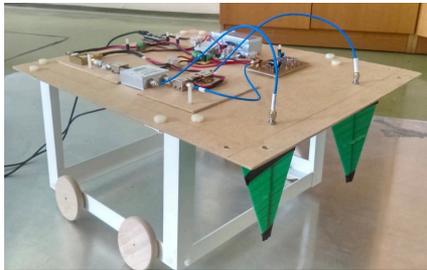
WG 4
GPR applications
outside from CE &
other NDT methods

COST Action TU1208: Examples of open science deliverables

Examples of open science deliverables

WG 1

Novel GPR Instrumentation



Guide to build a cheap GPR prototype

WG 2

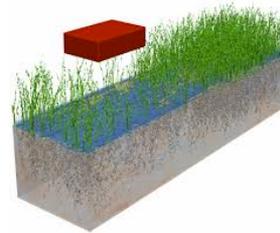
GPR surveying of roads, bridges, railways, tunnels,...



Guidelines for GPR use in civil engineering

WG 3

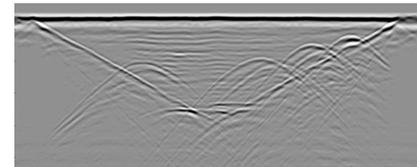
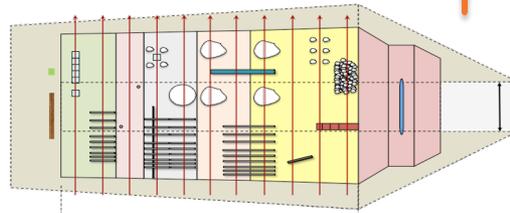
EM modelling, inversion, imaging, data processing



Free and open source software tools

WG 4

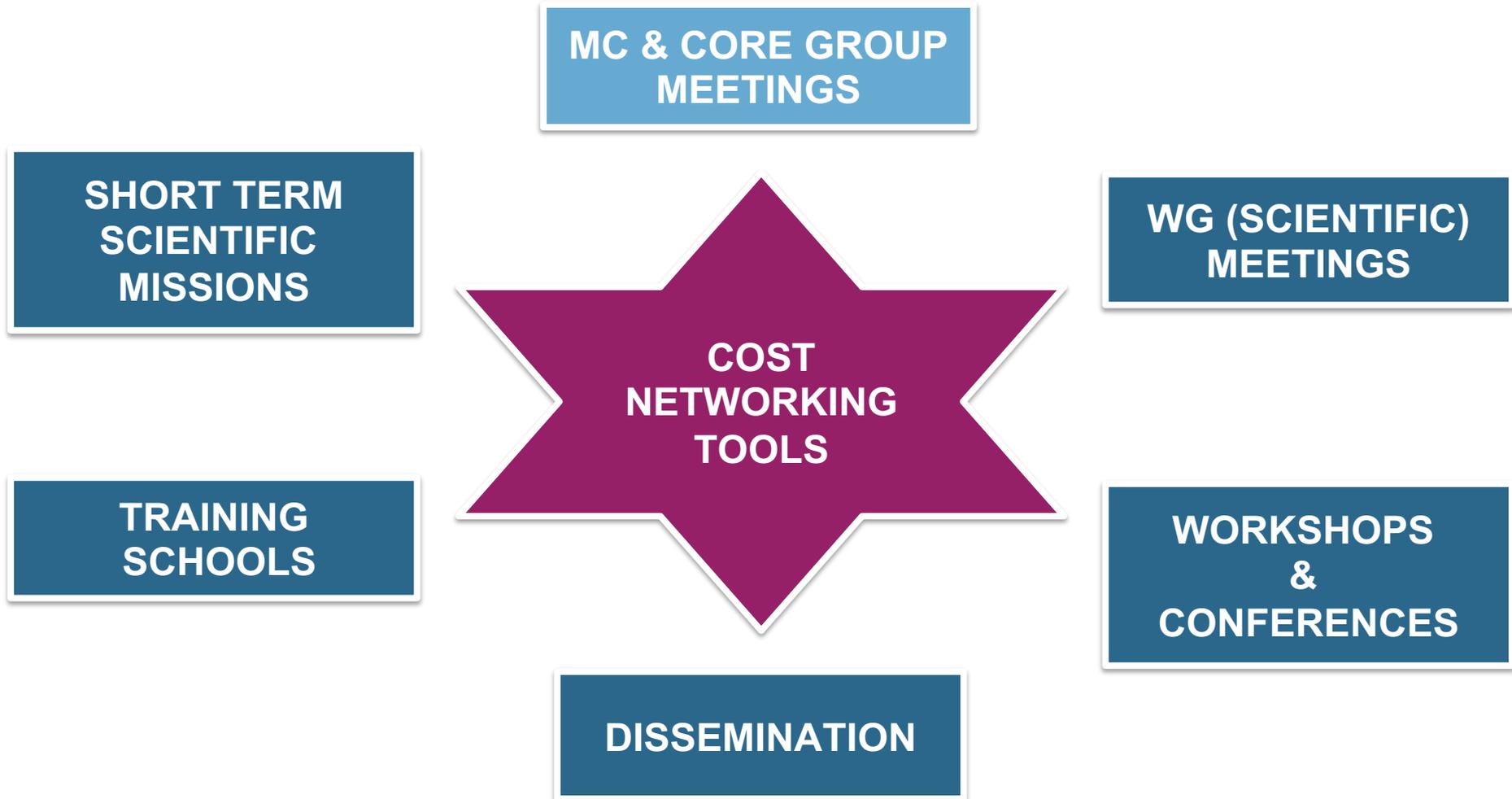
GPR applications outside from CE & other NDT methods



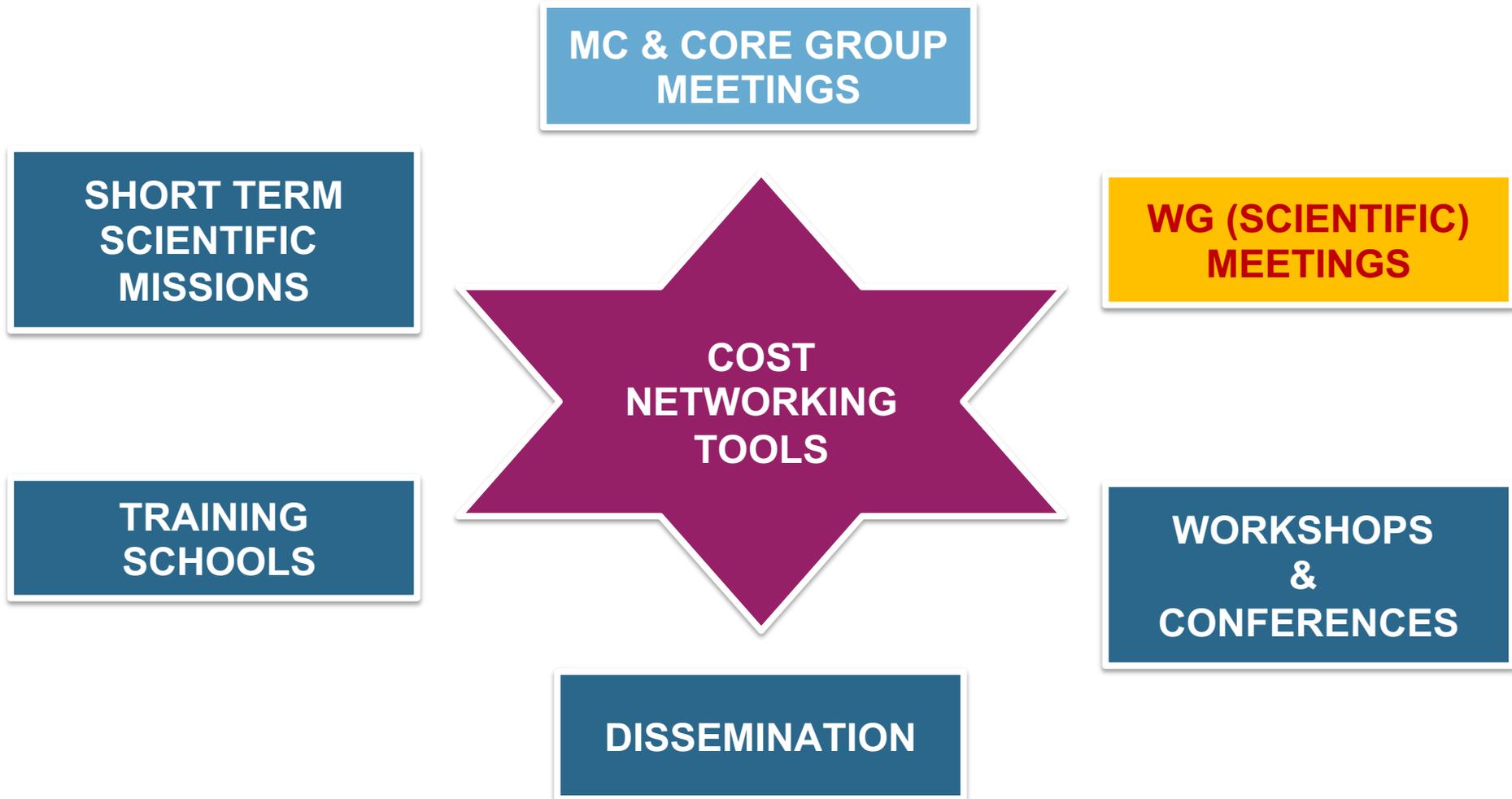
TU1208 Open Database of Radargrams

COST Action TU1208: Use of COST networking tools

COST networking tools



COST networking tools



TU1208 MC and WG Meetings

- Two General Meetings per year (MC+WG) and at least one smaller WG Meeting per year.
- Attendance to meetings was always open to scientists not involved in the Action, free of charge. The second General Meeting was exceptionally organized within the 2014 EGU GA, this gave great visibility to the Action's activities.
- The scientific structure and organization of the meetings changed during the Action's lifetime.

TU1208 GPR Road Show

- Our participation in the COST programme gave us significant insights into the importance of explaining scientific findings to non-scientific audiences.
- So we organised a series of dissemination activities to increase public awareness about ground penetrating radar (GPR) capabilities and applications, and to establish a dialogue with stakeholders and end-users of our research.
- Most of our educational and promotional activities were carried out in less-research intensive countries of the European continent, and we denominated the overall science-communication initiative “TU1208 GPR Roadshow”.
- Part of the Roadshow consisted of a series of non-scientific workshops and demonstrations held in Portugal, Italy, Greece, Croatia, Serbia, and the Czech Republic from March 2016 to May 2017.

TU1208 GPR Road Show

- Primary aim was to reach GPR stakeholders and potential new end users, at local, regional and national levels; secondary goal was the education of interested students and citizens.
- Attendance was always free of charge; talks and explanations were mostly given in native language, with few exceptions. Overall, 483 participants attended the Roadshow workshops and demonstrations.

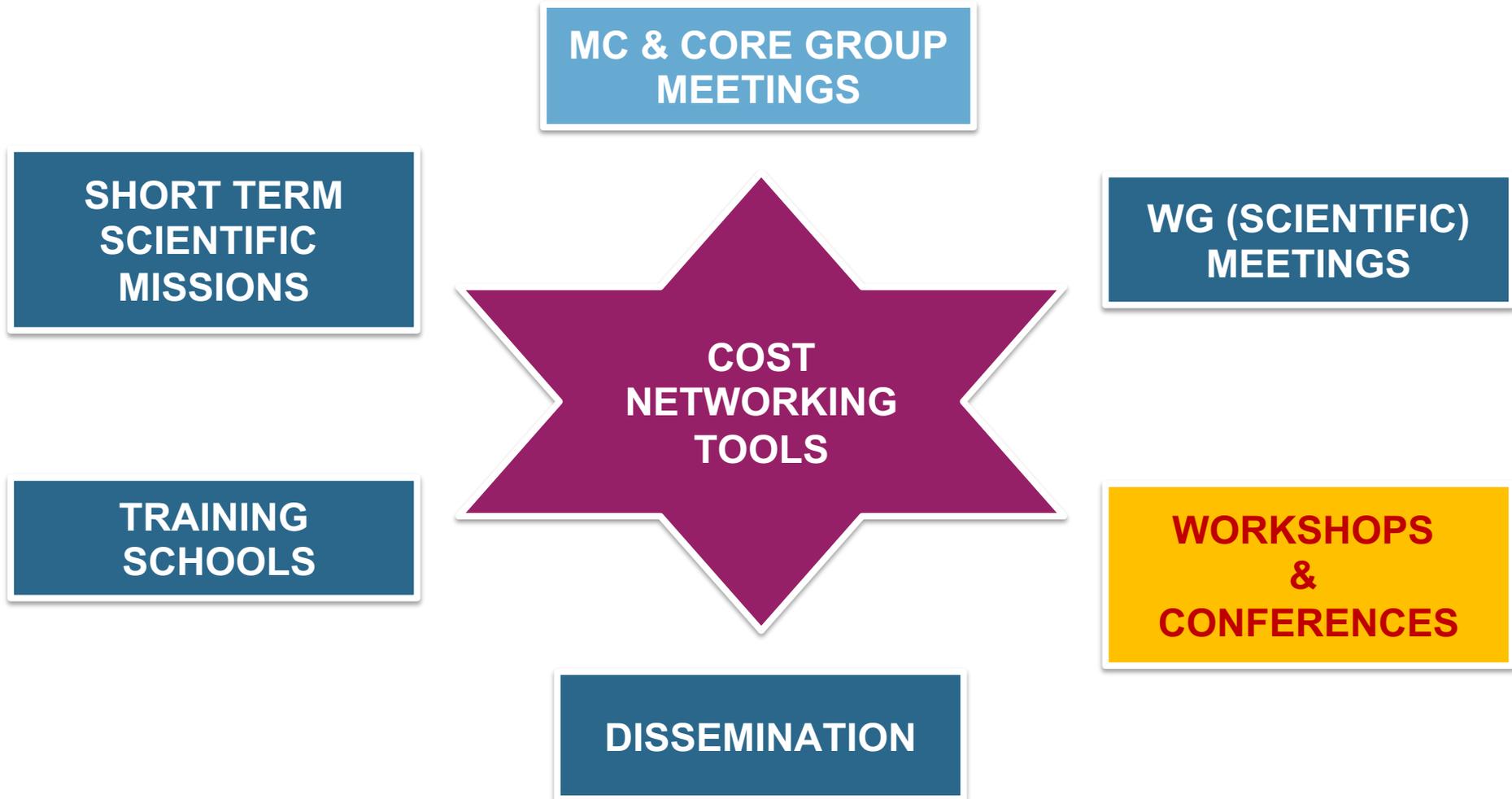


TU1208 GPR Road Show

- In parallel, a series of educational and promotional activities with children and citizens were carried out in Estonia:
 - ✓ several lectures were delivered in elementary and secondary schools,
 - ✓ practical workshops were held during the Researchers' Nights,
 - ✓ communication activities were organized in large events where enterprises were brought together with researchers,
 - ✓ lectures were given to children during summer schools,
 - ✓ short lectures were transmitted on public TV.

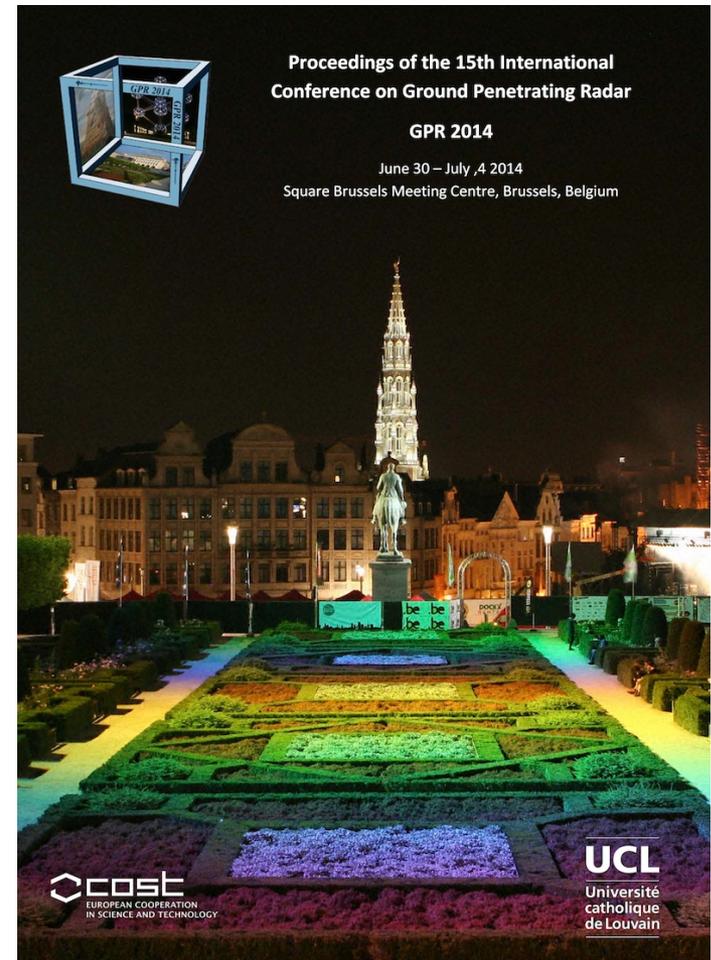


COST networking tools

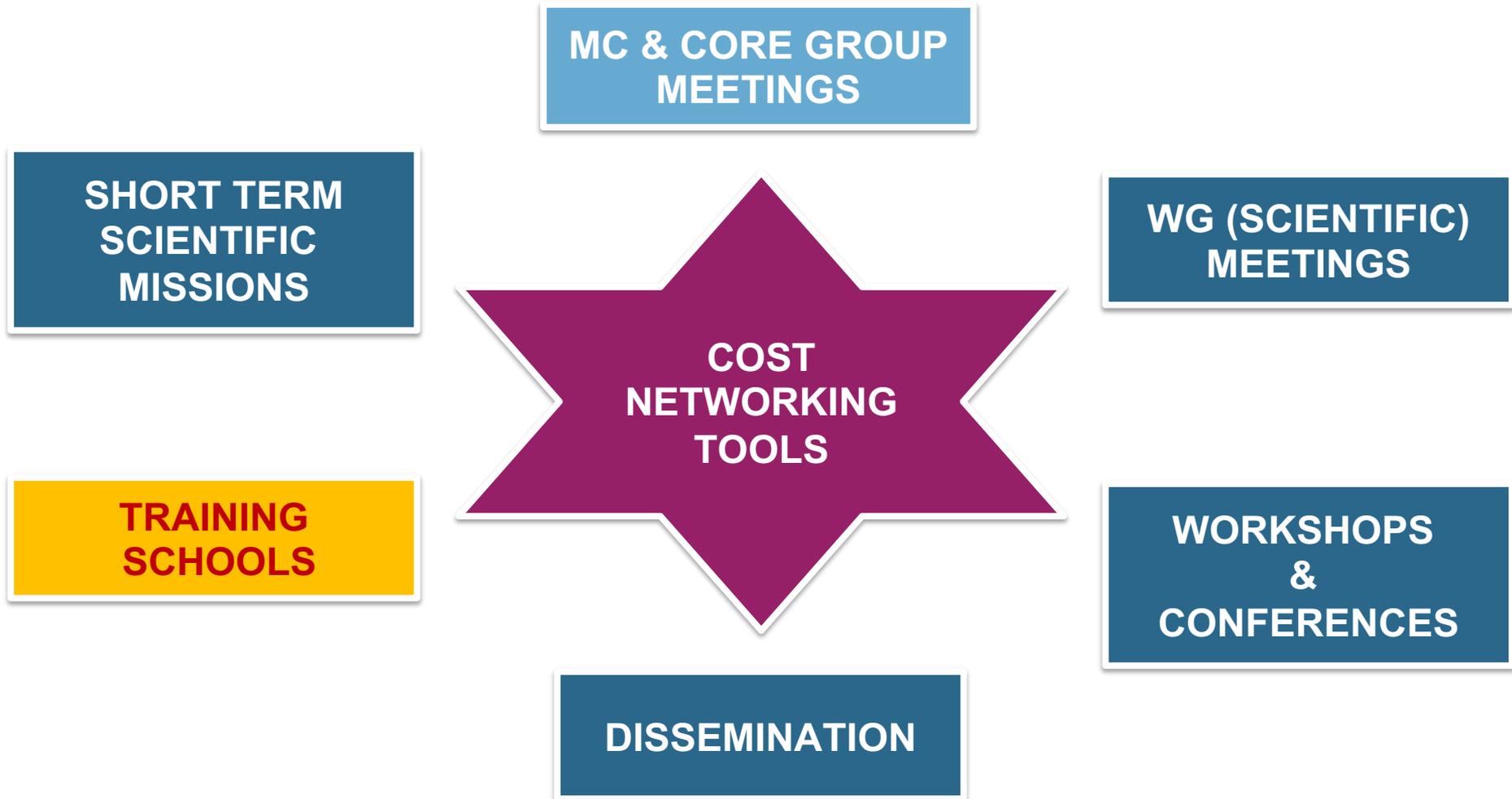


TU1208 Conferences

- 14^o International Conference on Ground Penetrating Radar (co-organized)
- 2017 edition of MetroArchaeo
- Final Conference of COST Action TU1208



COST networking tools



TU1208 Training Schools

- TU1208 organized **15 TSs**, overall attended by > 430 Trainees.



TU1208 Training Schools

- In almost all cases, Trainees could participate without paying a registration fee (exception: TS co-organized with ESOA, when ESOA covered all expenses and we just offered a few grants).
- The availability of so many free courses on GPR was an unprecedented phenomenon.
- After attending our schools, many Trainees joined the Action as WG or MC Members. This helped us to have a strong presence of young scientists in our network.
- About 150 Trainees received a Grant, which totally or partially covered their travel and accommodation expenses.
- Granted Trainees were always gathered in small groups of 3-4 Trainees from different countries and they were assigned a task to be developed when back home; each group was asked to submit a joint report to receive their grants. This was a way to encourage networking and collaboration between Trainees.

TU1208 Training Schools

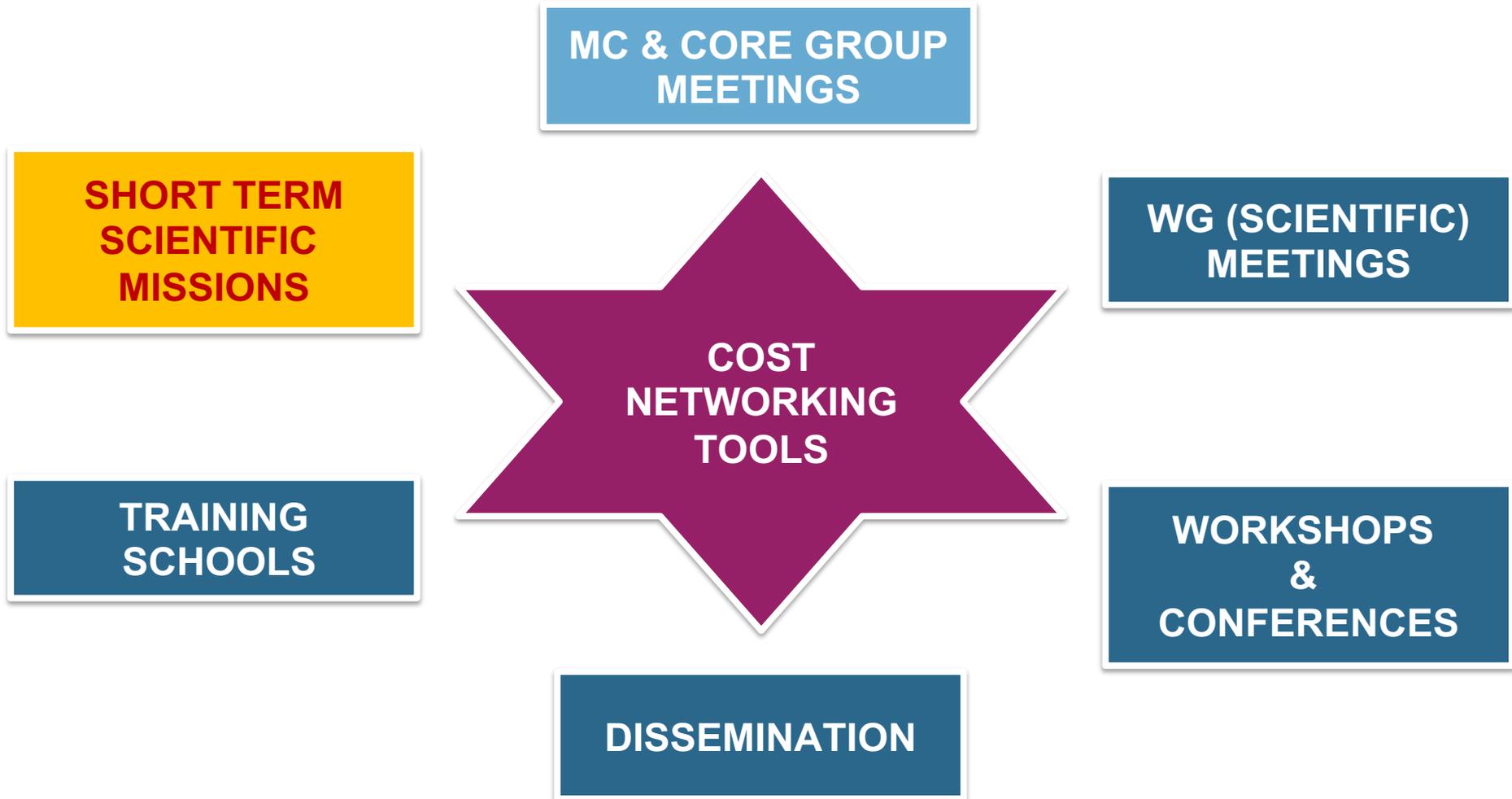


TU1208 Training Schools

- What is most important, is that young scientists will notably benefit, in their future career, from having participated to TU1208 TSs:
 - not only because they could learn about GPR,
 - but also in view of the fact that they could know each other and establish international cooperations with their peers in such an early stage of their career.

This will affect positively the long-term development of the GPR technique in Europe.

COST networking tools



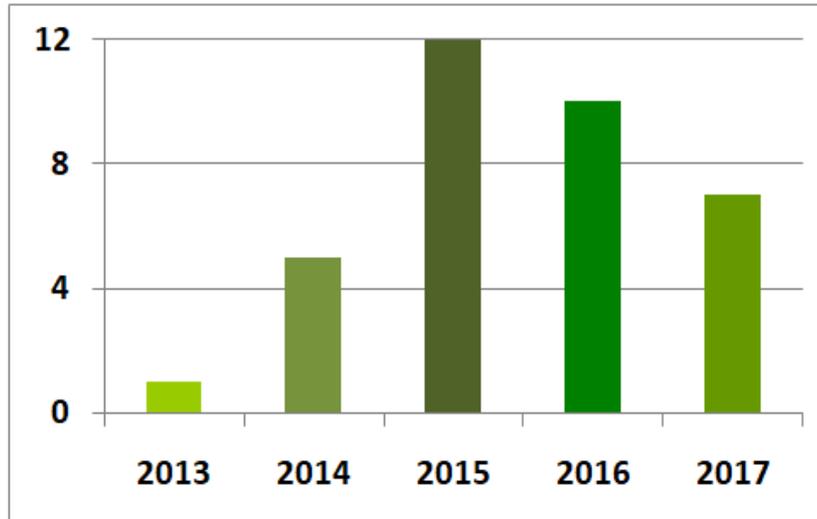
TU1208 Short-Term Scientific Missions



- **35 STSMs** were funded and successfully carried out. STSM exchanges went smoothly and efficiently, for the benefit of TU1208 research agenda.

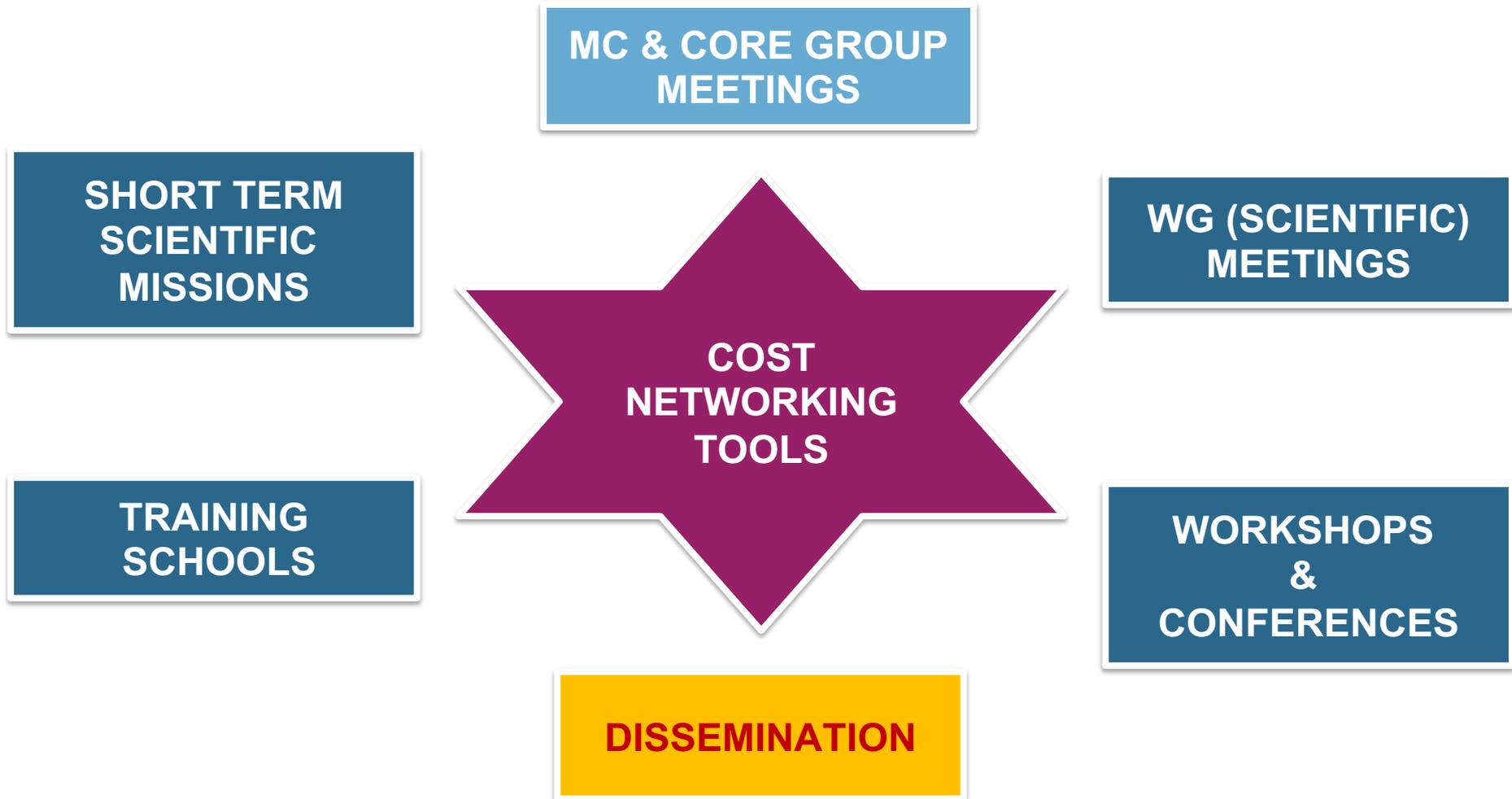
- A long-term cooperation has been initiated or strengthened in almost all cases.
- Young researchers were especially active.
- Joint STSM can be very useful for team work (similar to small meetings, but with easier reimbursement process).

TU1208 Short-Term Scientific Missions



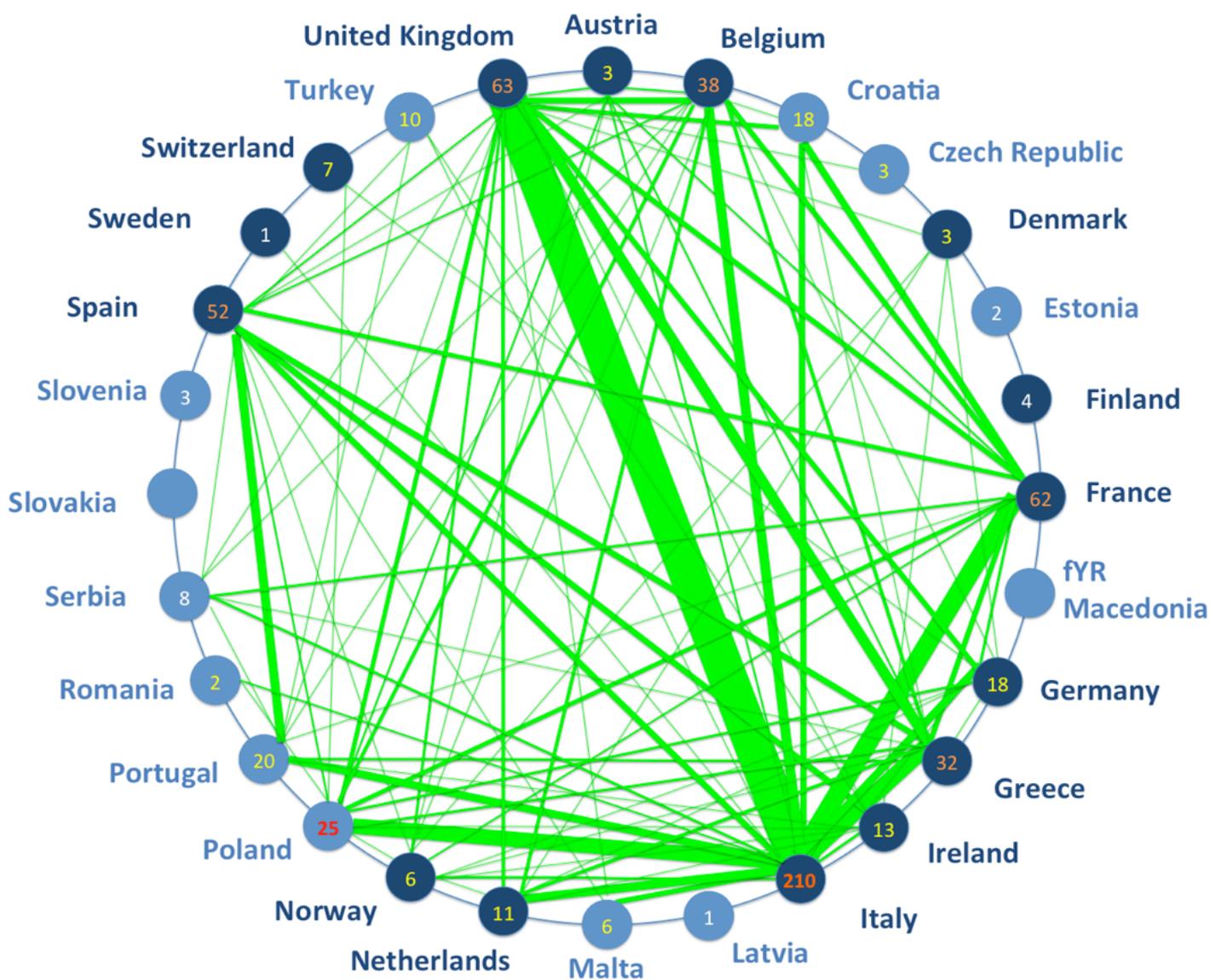
- STSM results have been always presented in conferences and/or published on journal papers. **All STSM reports were collected in four books**, which are available for download on the Action's website (www.gpradar.eu).
- STSM is a wonderful networking tool and we were expecting to receive several applications from our numerous Members. This initially did not happen.
- After Year 1, we decided to create a list of possible STSMs topics and host institutions. This idea helped the Action to increase the number of STSMs.
- The subsequent decrease is due to the fact that we started funding only STSM very strictly related to the advancement of the Action's scientific objectives.

COST networking tools



COST Action TU1208: Network of collaborations

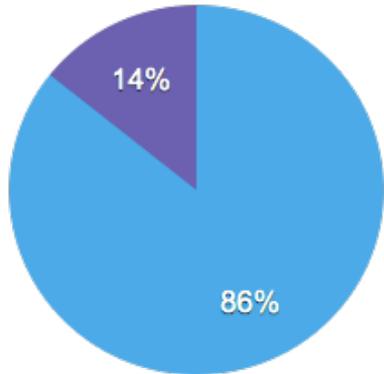
Publications on international peer-reviewed journals, books & conference proceedings with acknowledgement to TU1208: *Network of collaborations (COST Countries only)*



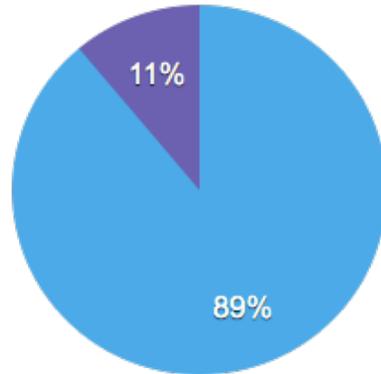
TU1208 Journal papers

● Research-intensive Countries only
● Inclusiveness Countries involved

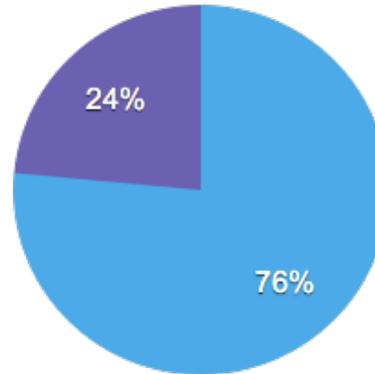
Year 1 (statistically non-significant)



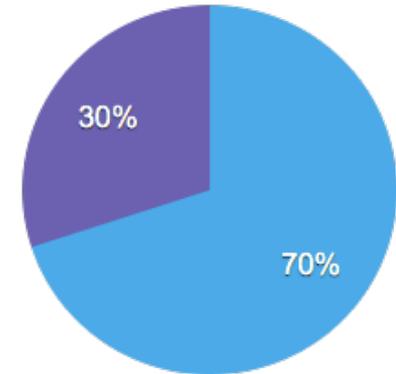
Year 2



Year 3



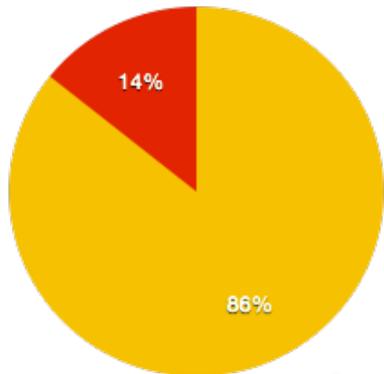
Year 4 + 6 months



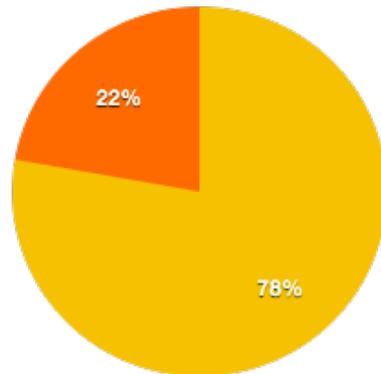
Reminder: 24% of our Members are from ITC

● Authors from 1 Country
● Authors from 2 Countries
● Authors from 3 or more Countries

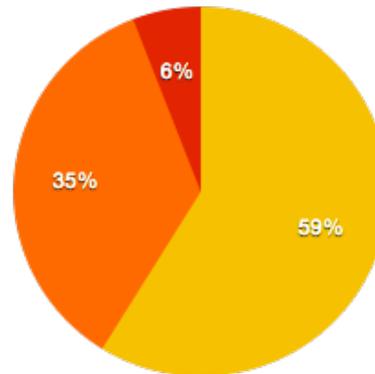
Year 1 (statistically non-significant)



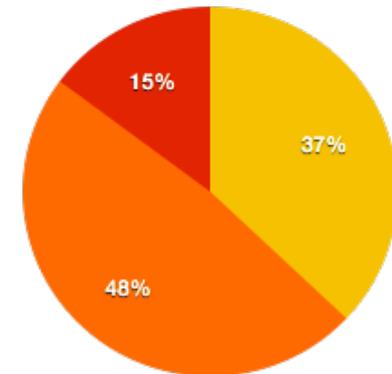
Year 2



Year 3



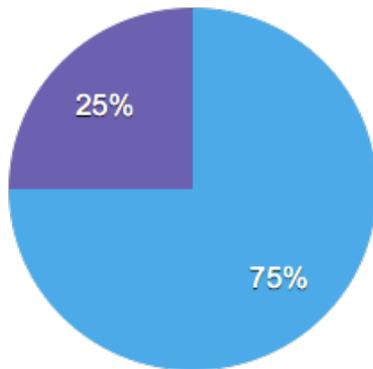
Year 4 + 6 months



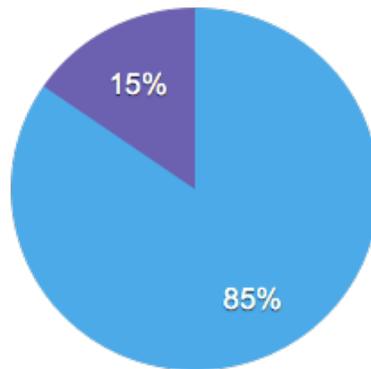
TU1208 Conference papers



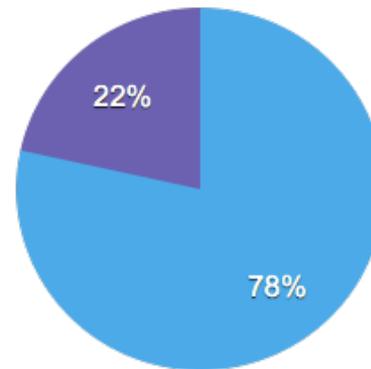
Year 1



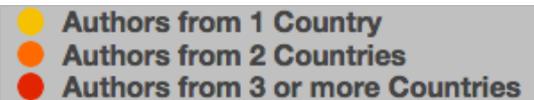
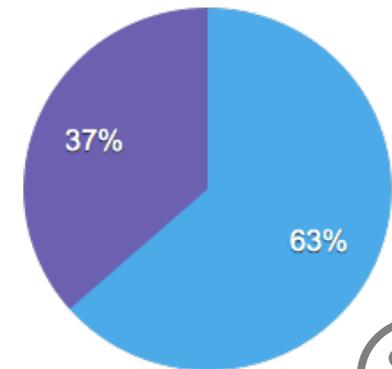
Year 2



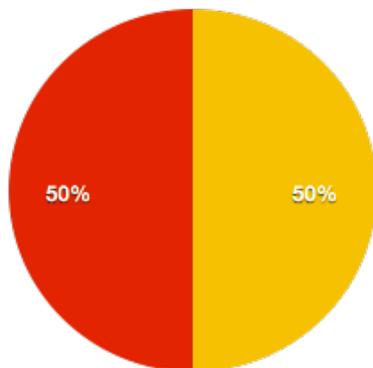
Year 3



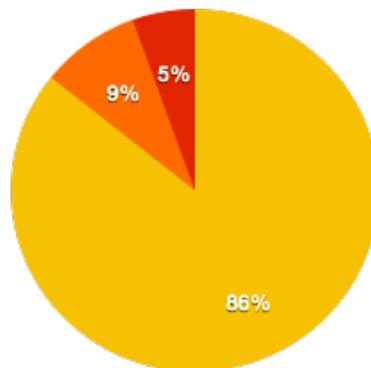
Year 4 + 6 months



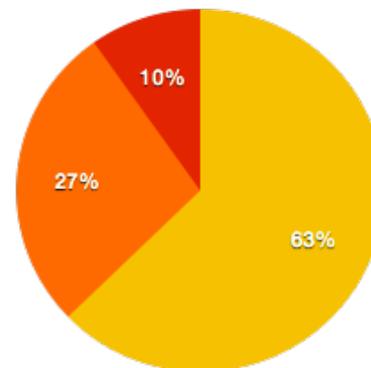
Year 1



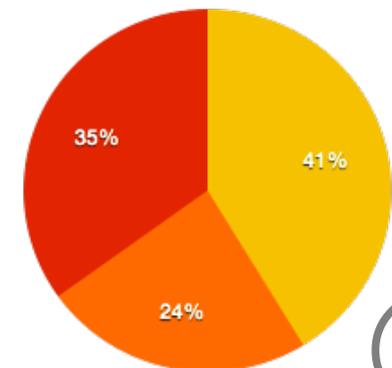
Year 2



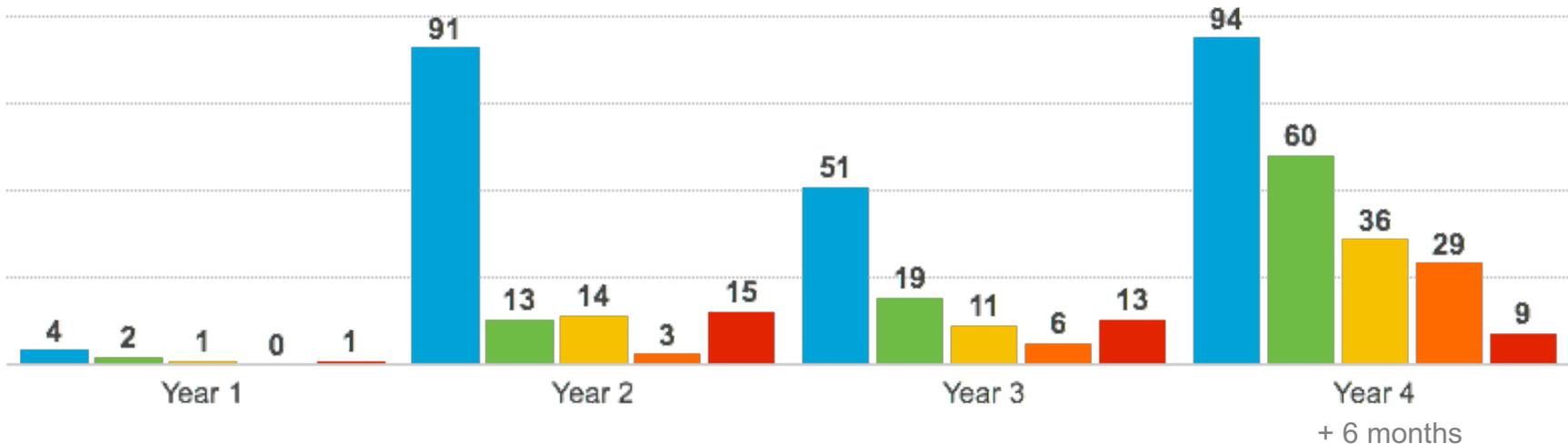
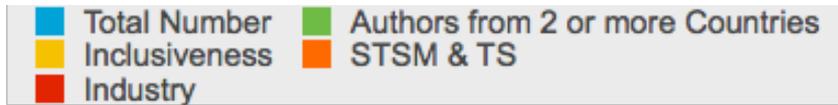
Year 3



Year 4 + 6 months



TU1208 Conference papers



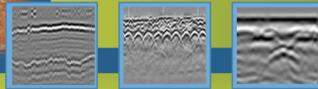
Total number in Year 4 similar to Year 2 (when we co-organized GPR 2014)... but the **percentage of papers co-authored by Members from different Countries** is completely different, as well as the number of papers from ICT.

Note also the **high number of papers stemming out from STSMs and TSs**, demonstrating the effectiveness of these COST networking tools.



25-27 SEPTEMBER 2017
WARSAW, POLAND

- NOVEL GROUND PENETRATING RADAR SYSTEMS AND ANTENNAS
- GUIDELINES FOR A SAFE AND EFFECTIVE USE OF GPR IN CIVIL ENGINEERING
- FREE SOFTWARE TOOLS FOR ELECTROMAGNETIC MODELLING AND RADARGRAM INTERPRETATION
- INTEGRATION OF GPR WITH COMPLEMENTARY NDT TECHNIQUES
- GPR FOR ENVIRONMENTAL, AGRICULTURAL AND CULTURAL-HERITAGE APPLICATIONS
- GPR TRAINING
- ... AND SO MUCH MORE



COST ACTION TU1208 – FINAL CONFERENCE

- | | |
|----------------|----------------|
| AUSTRIA | SLOVENIA |
| BELGIUM | SPAIN |
| CROATIA | SWEDEN |
| CZECH REPUBLIC | SWITZERLAND |
| DENMARK | TURKEY |
| ESTONIA | UNITED KINGDOM |
| FINLAND | ISRAEL |
| FRANCE | |
| FYR MACEDONIA | ALBANIA |
| GERMANY | ARMENIA |
| GREECE | EGYPT |
| IRELAND | JORDAN |
| ITALY | RUSSIA |
| LATVIA | UKRAINE |
| MALTA | |
| NETHERLANDS | AUSTRALIA |
| NORWAY | COLOMBIA |
| POLAND | HONG KONG |
| PORTUGAL | PHILIPPINES |
| ROMANIA | RWANDA |
| SERBIA | USA |
| SLOVAKIA | |



WELCOME IN POLAND AND THANK YOU FOR COMING!

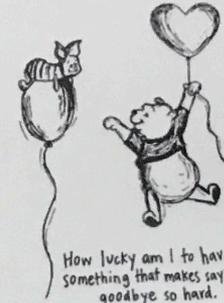


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Warsaw, Poland, 25-27 September 2017

Final Conference of the COST Action TU1208
"Civil engineering applications of Ground Penetrating Radar"

Welcome and thank you for participating!



How lucky am I to have something that makes saying goodbye so hard.
- Winnie the Pooh

Hope we all bring in our future projects and spread out the
we have experienced together in TU1208

cooperation sharing open science embracing diversity



humbleness

both

cost
Action TU1208

Lara Pajewski
Sapienza University of Rome
ITALY



Acknowledgements

Thank you to all scientists and experts participating in this session for their attention and contribution.

Endless thanks to COST (European Cooperation in Science and Technology) for funding and supporting COST Action TU1208.

Heartfelt and infinite thanks to Mickael Pero and Carmencita Malimban, for being the best Science and Administrative Officers one can have. Many thanks also to Cristina Pronello and Thierry Goger, for their help and support to the Action, in its different stages.

Many thanks to all Members of COST Action TU1208 who contributed to the success of our Action with their participation, ideas, knowledge, enthusiasm, commitment and friendship.