

# Novel national and international Ground Penetrating Radar Associations

Lara Pajewski

Sapienza University of Rome, Italy - [lara.pajewski@uniroma1.it](mailto:lara.pajewski@uniroma1.it)

Raffaele Persico

Institute for Archaeological and Monumental Heritage IBAM-CNR, Italy  
& International Telematic University Uninettuno, Italy - [r.persico@ibam.cnr.it](mailto:r.persico@ibam.cnr.it)



# Summary of the talk

---

1

## **TU1208 GPR Association**



Overview: Reasons, objectives, key principles and participants



Research, training and dissemination activities; benefits for Members



Contacts

TU1208

2

## **Associazione Italiana del Georadar**



What is it?  
Why talking about it here?



Purposes & Actions

ASSOCIAZIONE  
ITALIANA  
DEL GEORADAR

01

# **TU1208 GPR Association**



# Overview: Reasons

---

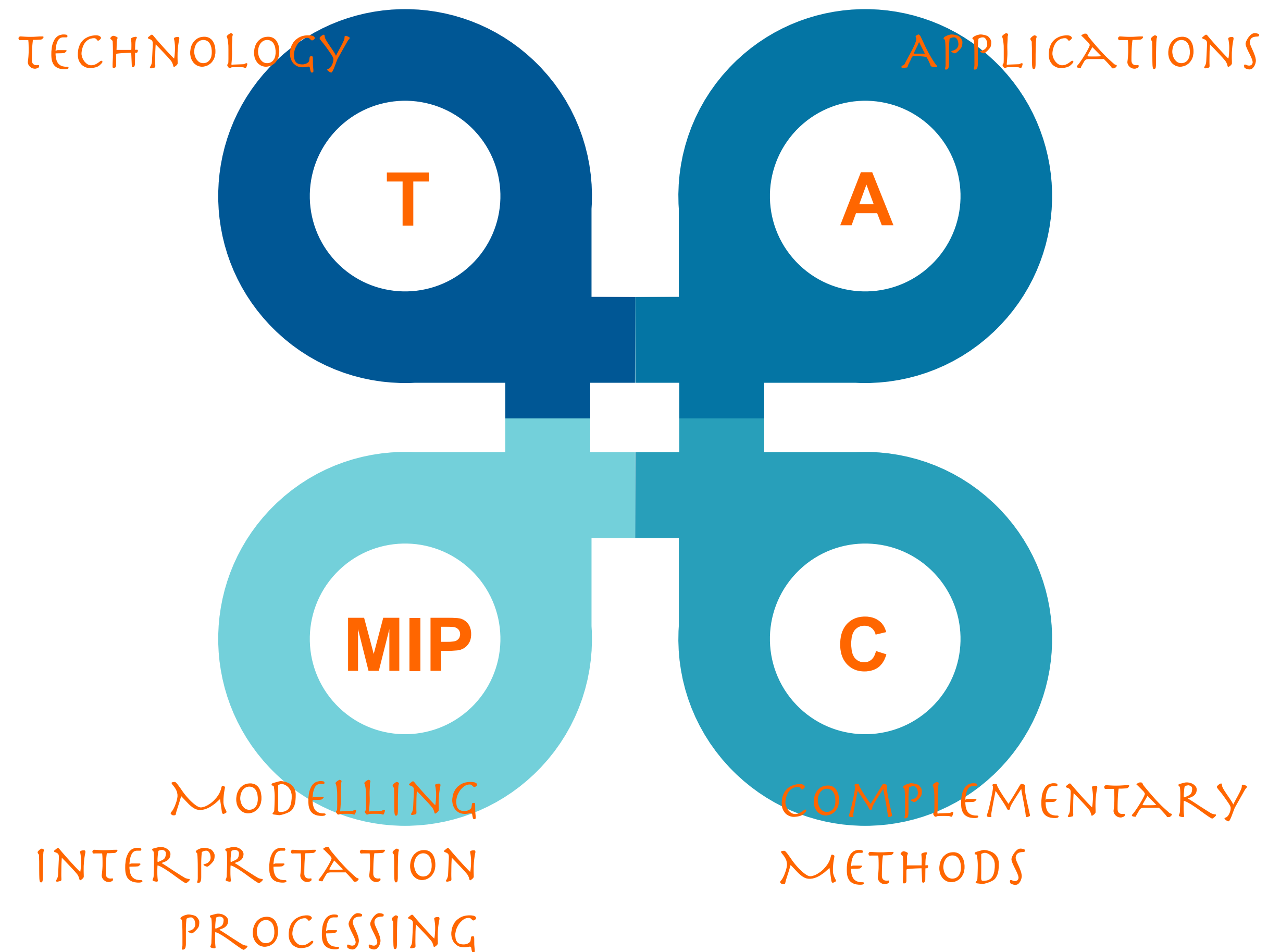
- Non-profit international association founded in September 2017 as a follow up of the COST (European Cooperation in Science and Technology) Action TU1208 “Civil engineering applications of Ground Penetrating Radar,” to further support cooperation between Universities, research centres, private companies and public agencies active in the GPR field.





# Overview: Objectives

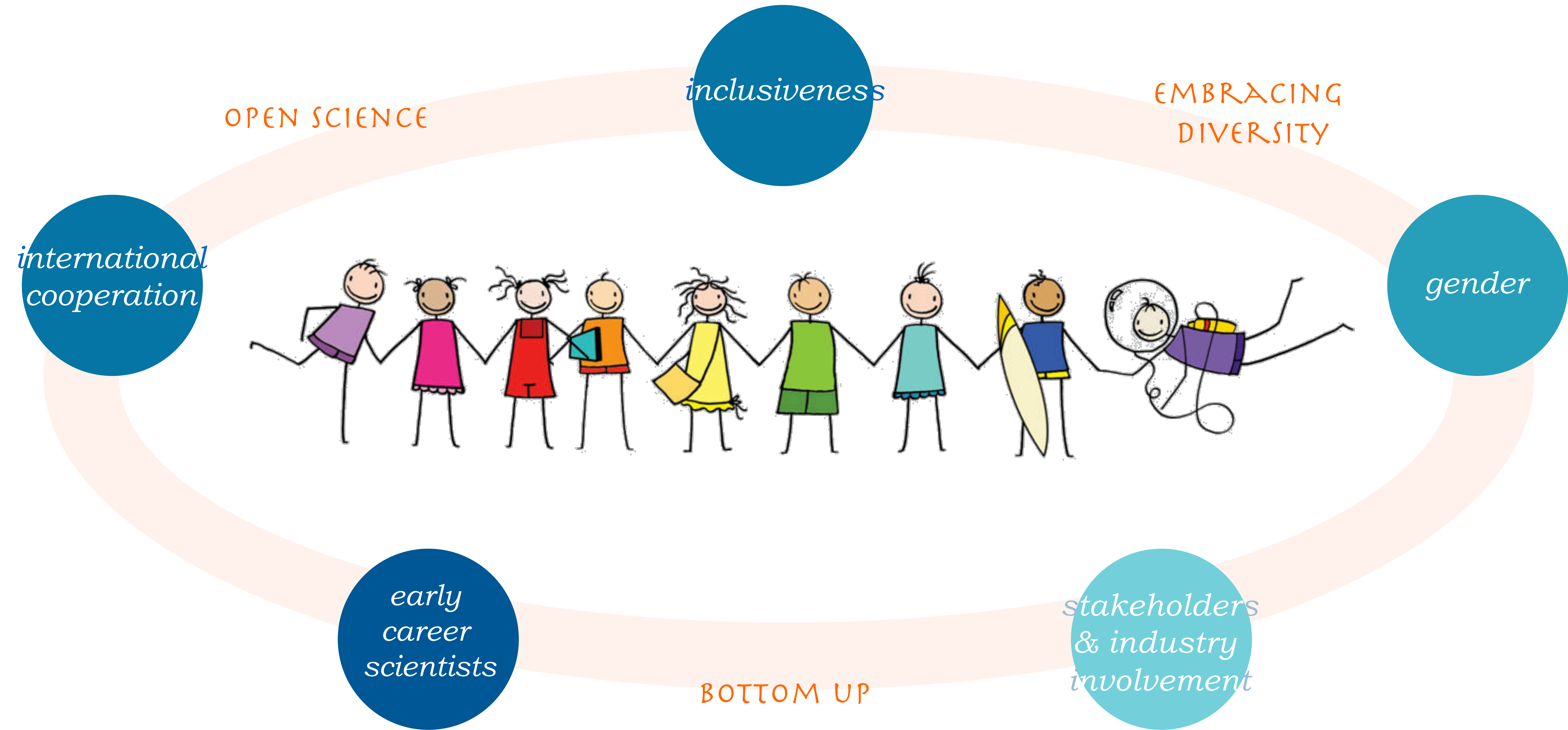
---



- The association inherited the same primary objective of the Action: exchange and increase scientific-technical knowledge and experience of GPR technique, whilst promoting a wider and effective use of this safe and non-destructive method.



# Overview: Key principles





# Overview: Participants

---



- 29 Members, 19 institutes, 10 countries



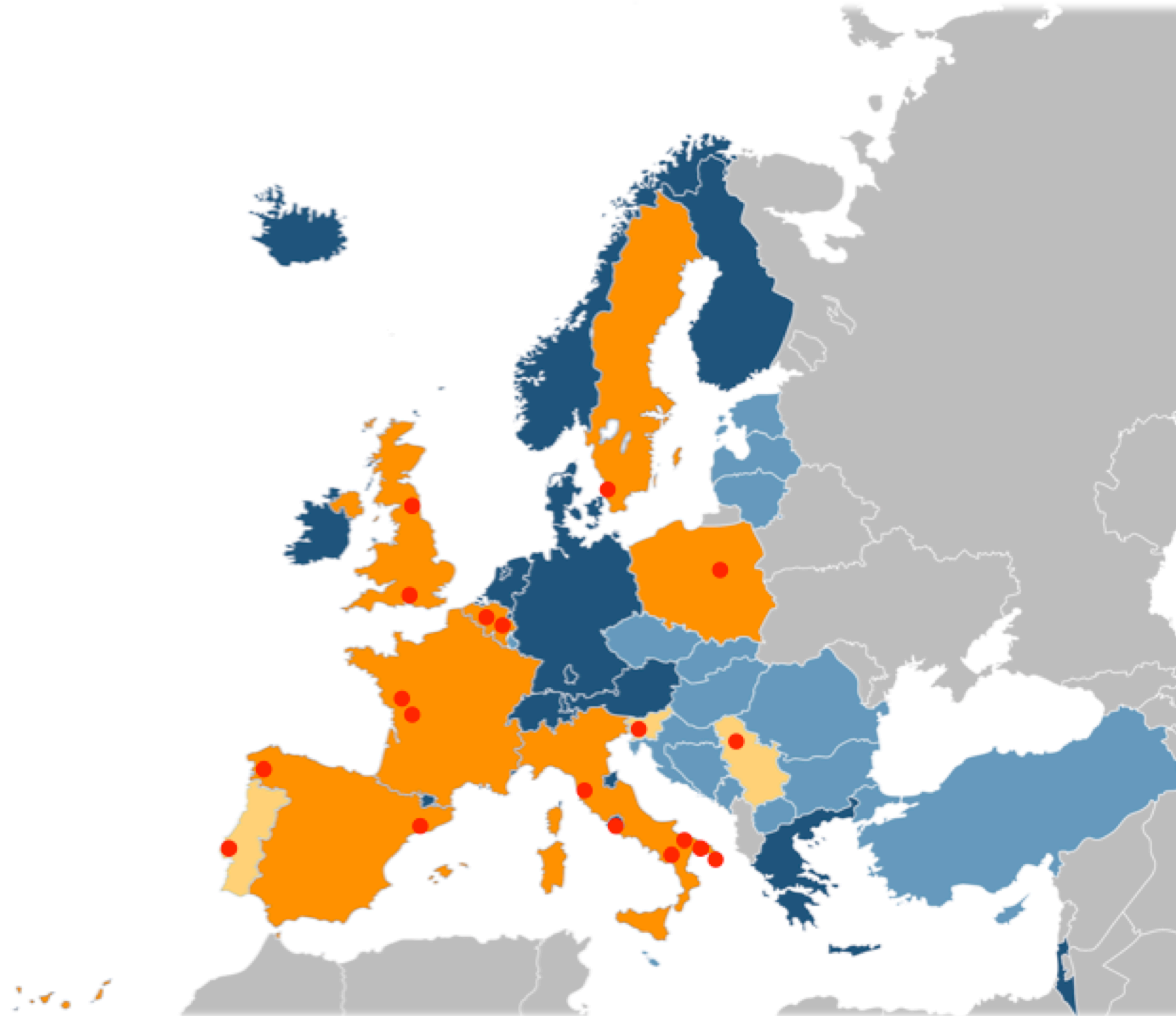
10 universities

5 research centres

1 public agency

1 high school

2 private companies





# Activities

---



- We are at Month 6 of the Association lifetime
- Webpage dedicated to the Association with information about its Members and initiatives – Blog
- Association registered as a Publishing House → we can e-volumes with ISBN and DOI numbers published in OA on the Association website
- We have founded *Ground Penetrating Radar*, the first peer-reviewed scientific journal dedicated to GPR

## **Main planned events:**

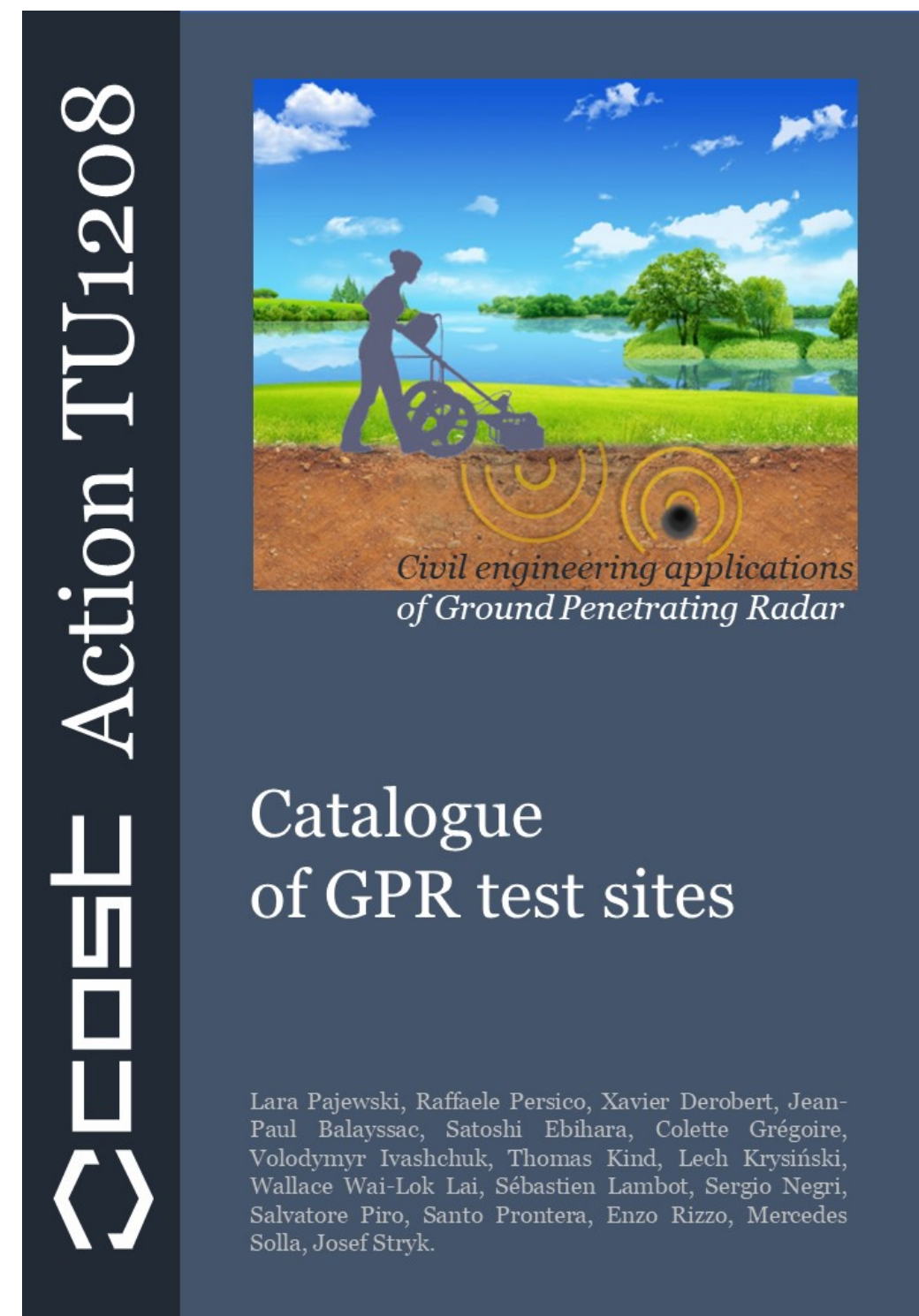
- Training School on the use of GPR in civil engineering and cultural heritage management  
Rome, Italy, 14-18 May 2018
- We are involved in the organization of IWAGPR 2019 | Rome, Italy, 3-5 July 2019



# Published volumes



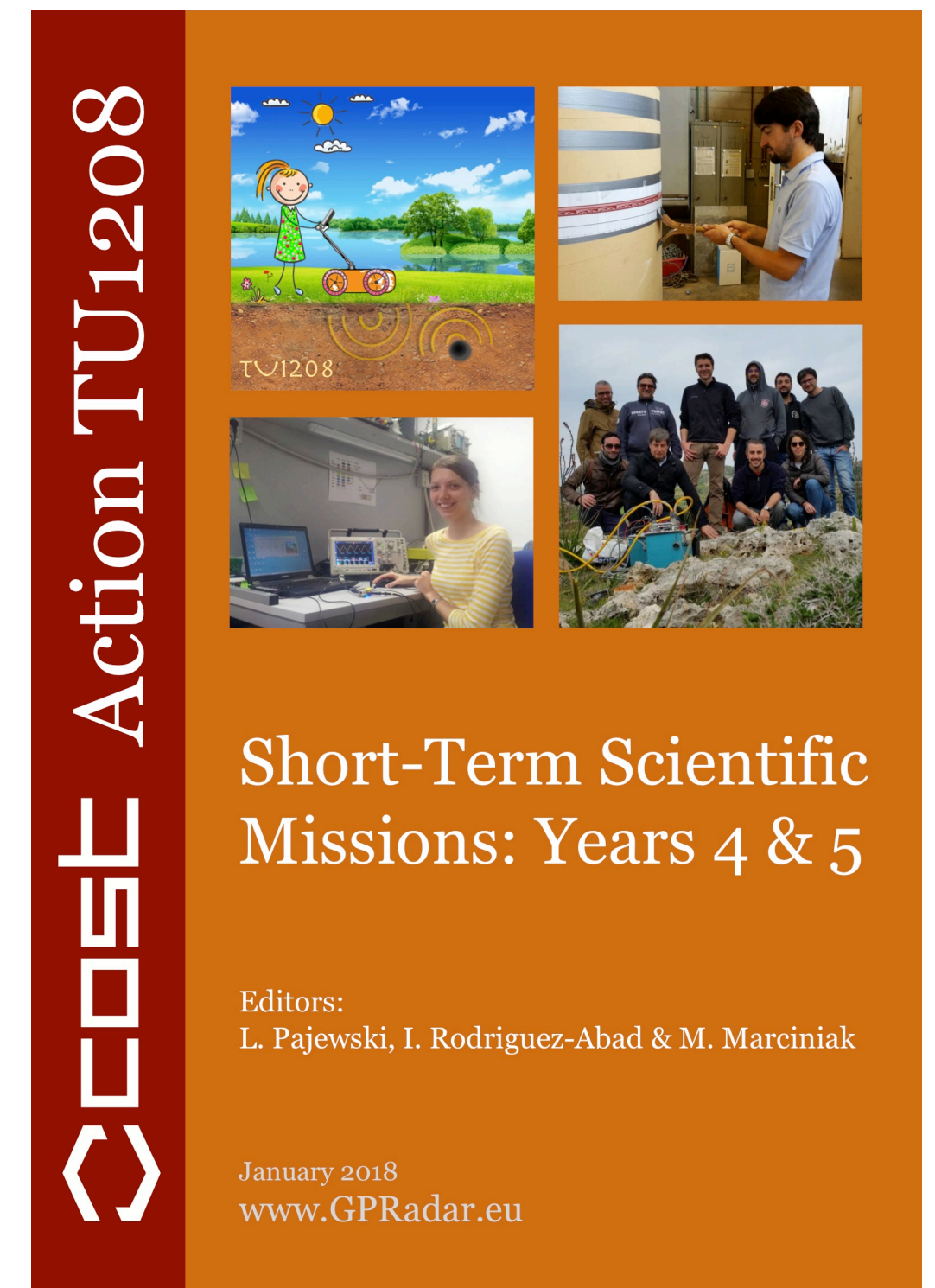
1



2

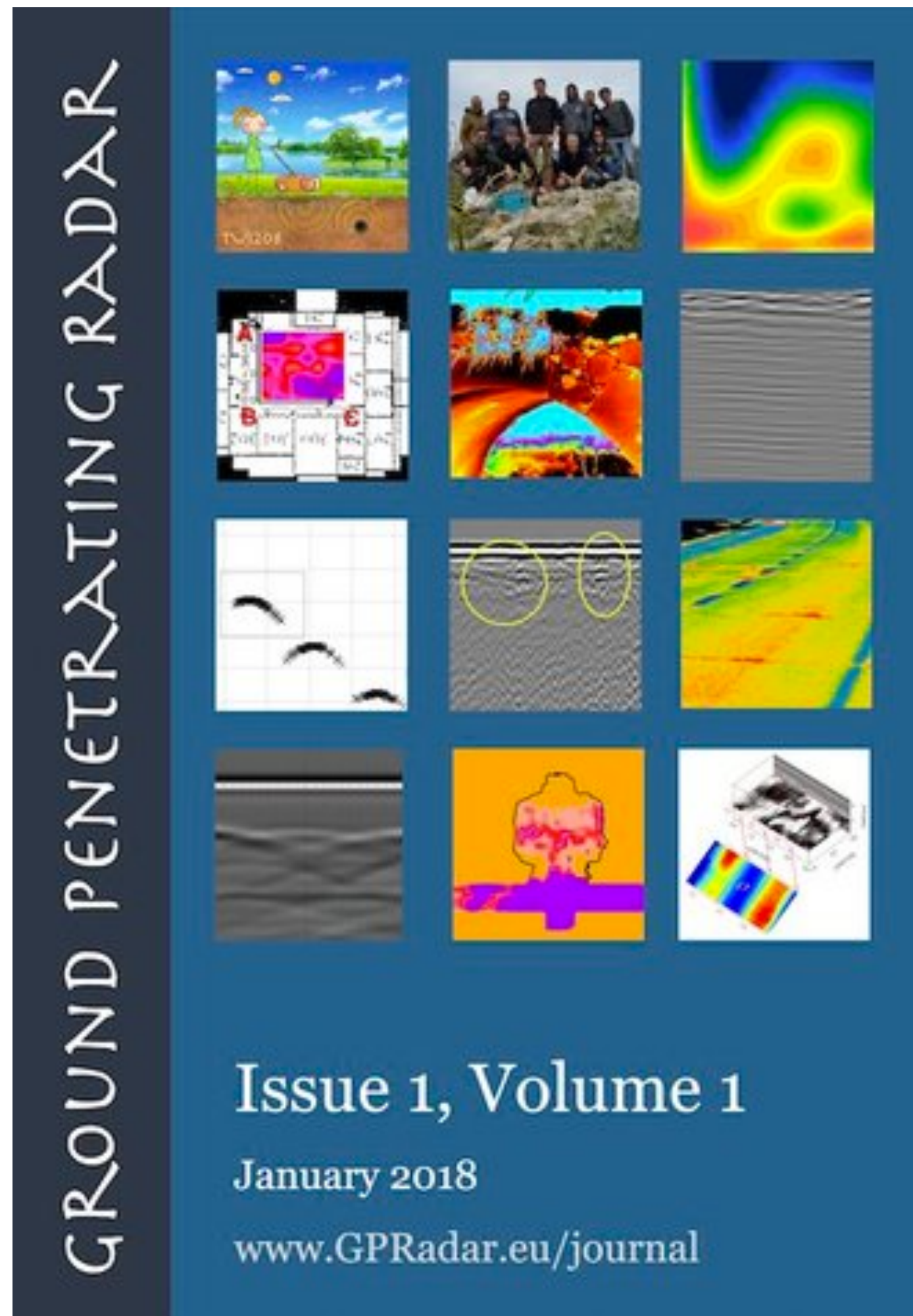


3





# Ground Penetrating Radar



<b>USE OF GROUND PENETRATING RADAR AND STANDARD GEOPHYSICAL METHODS TO EXPLORE THE SUBSURFACE</b>
RAFFAELE PERSICO <sup>1</sup> & SEBASTIANO D'AMICO <sup>2</sup>
<sup>1</sup> INSTITUTE FOR ARCHAEOLOGICAL AND MONUMENTAL HERITAGE OF THE NATIONAL RESEARCH COUNCIL (IBAM-CNR), LECCE, ITALY R.PERSICO@IBAM.CNR.IT
<sup>2</sup> UNIVERSITY OF MALTA, FACULTY OF SCIENCE, MSIDA, MALTA SEBASTIANO.DAMICO@UM.EDU.MT
<b>ABSTRACT</b>
<i>This paper presents the results of a series of Ground Penetrating Radar (GPR) and passive seismic measurements performed in Malta in 2015, during a Short-Term Scientific Mission (STSM) funded by COST (European Cooperation in Science and Technology) Action TU1208 "Civil engineering applications of Ground Penetrating Radar." The main purposes of the measurements were: to test the performance of an innovative reconfigurable stepped-frequency GPR prototype, recently upgraded thanks to the results of the research activities carried out in Norway during a previous TU1208 STSM; to investigate the geological conditions of some sites of historical and environmental interest; and to assess the internal status of two monuments. To the best of our knowledge, the GPR measurements carried out during this STSM constitute the first GPR investigations ever performed in Malta.</i>

<b>ELECTRICAL RESISTIVITY TOMOGRAPHY INVESTIGATIONS IN MGARR (MALTA)</b>
RAFFAELE PERSICO <sup>1</sup> , SEBASTIANO D'AMICO <sup>2</sup> , ENZO RIZZO <sup>3</sup> , LUIGI CAPOZZOLI <sup>3</sup> & AARON MICALLEF <sup>2</sup>
<sup>1</sup> INSTITUTE FOR ARCHAEOLOGICAL AND MONUMENTAL HERITAGE OF THE NATIONAL RESEARCH COUNCIL (IBAM-CNR), LECCE, ITALY R.PERSICO@IBAM.CNR.IT
<sup>2</sup> UNIVERSITY OF MALTA, FACULTY OF SCIENCE, MSIDA, MALTA SEBASTIANO.DAMICO@UM.EDU.MT, AARON.MICALLEF@UM.EDU.MT
<sup>3</sup> INSTITUTE OF METHODOLOGIES FOR ENVIRONMENTAL ANALYSIS OF THE NATIONAL RESEARCH COUNCIL (CNR-IMAA), TITO SCALO - POTENZA, ITALY ENZO.RIZZO@IMAA.CNR.IT, LUIGI.CAPOZZOLI@IMAA.CNR.IT
<b>ABSTRACT</b>
<i>This paper presents the results of electrical resistivity tomography (ERT) investigations carried out in Mgarr, Malta. All measurements were performed during a Short-Term Scientific Mission (STSM) funded by the COST (European Cooperation in Science and Technology) Action TU1208 "Civil engineering applications of Ground Penetrating Radar." The work performed during the STSM consisted also in the processing and interpretation of the gathered data.</i>

<b>A PRACTICAL GUIDE ON USING SPOT-GPR, A FREEWARE TOOL IMPLEMENTING A SAP-DOA TECHNIQUE</b>
SIMONE MESCHINO <sup>1</sup> & LARA PAJEWSKI <sup>2</sup>
<sup>1</sup> AIRBUS DS, SAR SYSTEMS ENGINEERING, FRIEDRICHSHAFEN, GERMANY SIMONE.MESCHINO@GMAIL.COM
<sup>2</sup> SAPIENZA UNIVERSITY OF ROME, DEPARTMENT OF INFORMATION ENGINEERING, ELECTRONICS AND TELECOMMUNICATIONS, ROME, ITALY LARA.PAJEWSKI@UNIROMA1.IT
<b>ABSTRACT</b>
<i>This is a software paper, which main objective is to provide practical information on how to use SPOT-GPR release 1.0, a MATLAB®-based software for the analysis of ground penetrating radar (GPR) profiles. The software allows detecting targets and estimating their position in a two-dimensional scenario, it has a graphical user interface and implements an innovative sub-array processing method. SPOT-GPR was developed in the framework of the COST Action TU1208 "Civil Engineering Applications of Ground Penetrating Radar" and is available for free download on the website of the Action (<a href="http://www.GPRadar.eu">www.GPRadar.eu</a>).</i>

<b>GROUND PENETRATING RADAR INVESTIGATIONS IN SITES OF CULTURAL INTEREST IN MALTA</b>
RAFFAELE PERSICO <sup>1</sup> , SEBASTIANO D'AMICO <sup>2</sup> , ENZO RIZZO <sup>3</sup> , LUIGI CAPOZZOLI <sup>3</sup> & AARON MICALLEF <sup>2</sup>
<sup>1</sup> INSTITUTE FOR ARCHAEOLOGICAL AND MONUMENTAL HERITAGE OF THE NATIONAL RESEARCH COUNCIL (IBAM-CNR), LECCE, ITALY R.PERSICO@IBAM.CNR.IT
<sup>2</sup> UNIVERSITY OF MALTA, FACULTY OF SCIENCE, MSIDA, MALTA SEBASTIANO.DAMICO@UM.EDU.MT, AARON.MICALLEF@UM.EDU.MT
<sup>3</sup> INSTITUTE OF METHODOLOGIES FOR ENVIRONMENTAL ANALYSIS OF THE NATIONAL RESEARCH COUNCIL (CNR-IMAA), TITO SCALO - POTENZA, ITALY ENZO.RIZZO@IMAA.CNR.IT, LUIGI.CAPOZZOLI@IMAA.CNR.IT
<b>ABSTRACT</b>
<i>This paper presents the results of a series of geophysical surveys carried out in Malta. In particular, we used a reconfigurable stepped-frequency Ground Penetrating Radar (GPR) prototype to inspect the Argotti Garden in Floriana, looking for ancient buried cisterns, and the floor of the Nymphaeum inside the garden, to assess its conditions prior to restoration works. We subsequently used a commercial pulsed GPR system to assess the walls of the co-cathedral of St. John, in Valletta, and the walls of a building of the University of Malta, in Msida. All measurements were performed during a Short-Term Scientific Mission (STSM) funded by the COST (European Cooperation in Science and Technology) Action TU1208 "Civil engineering applications of Ground Penetrating Radar." Of course the work performed during the STSM consisted also in the processing and interpretation of the gathered data.</i>

<b>NON-DESTRUCTIVE TESTS FOR RAILWAY EVALUATION: DETECTION OF FOULING AND JOINT INTERPRETATION OF GPR DATA AND TRACK GEOMETRIC PARAMETERS</b>
MERCEDES SOLLA <sup>1</sup> & SIMONA FONTUL <sup>2</sup>
<sup>1</sup> DEFENSE UNIVERSITY CENTER, SPANISH NAVAL ACADEMY, MARIN, SPAIN MERCHISOLLA@CUD.UVIGO.ES
<sup>2</sup> NATIONAL LABORATORY FOR CIVIL ENGINEERING (LNEC), LISBON, PORTUGAL SIMONA@LNEC.PT
<b>ABSTRACT</b>
<i>This paper deals with railway assessment by using Ground Penetrating Radar, eventually combined with Falling Weight Deflectometer and Light Falling Weight Deflectometer. All measurements were performed during a Short-Term Scientific Mission (STSM) funded by the COST (European Cooperation in Science and Technology) Action TU1208 "Civil engineering applications of Ground Penetrating Radar." In particular, the tasks addressed were: 1. Detection of track defects at infrastructure level (voids and cracking); 2. Measurement of layer thickness; and, 3. Evaluation of the fouling level of ballast.</i>

<b>THERMOGRAPHY: PRINCIPLES AND APPLICATIONS</b>
MERCEDES SOLLA <sup>1</sup> & SUSANA LAGÜELA <sup>2</sup>
<sup>1</sup> DEFENSE UNIVERSITY CENTER, SPANISH NAVAL ACADEMY, MARIN, SPAIN MERCHISOLLA@CUD.UVIGO.ES
<sup>2</sup> UNIVERSITY OF SALAMANCA, DEPARTMENT OF CARTOGRAPHIC AND TERRAIN ENGINEERING, ÁVILA, SPAIN SULAGUELA@USAL.ES
<b>ABSTRACT</b>
<i>This tutorial presents the main principles of the thermography technique and the civil-engineering applications of this non-destructive testing method. Several examples are given and two case studies are presented, where thermography and Ground Penetrating Radar are jointly used to assess a radiant heating floor installed in a building, and to detect moisture in a masonry arch bridge.</i>

The scope of the journal spans all of the latest and emerging research in the GPR field.

## Journal topics:

- ✓ New instrumentation development;
- ✓ Applications of GPR in earth and planetary sciences, environmental and civil engineering, archaeology and cultural heritage, forensics and security, and any other areas;
- ✓ Advancement and use of processing, electromagnetic modelling, imaging, and inversion methods for GPR;
- ✓ GPR use in combination with complementary NDT techniques.

Open access, open science – Published quarterly – No article publication charges – doi; CrossRef



# Training School (Rome, 14-18 May 2018)



14  
MAY

## DAY 1

GPR basic principles  
Choice of equipment  
for different applic.

GPR technology

Showcase of  
prototypes and  
commercial systems



15  
MAY

## DAY 2

Civil engineering,  
geological and  
geotechnical  
applications of  
GPR



16  
MAY

## DAY 3

Applications of  
GPR in  
archaeology and  
cultural heritage

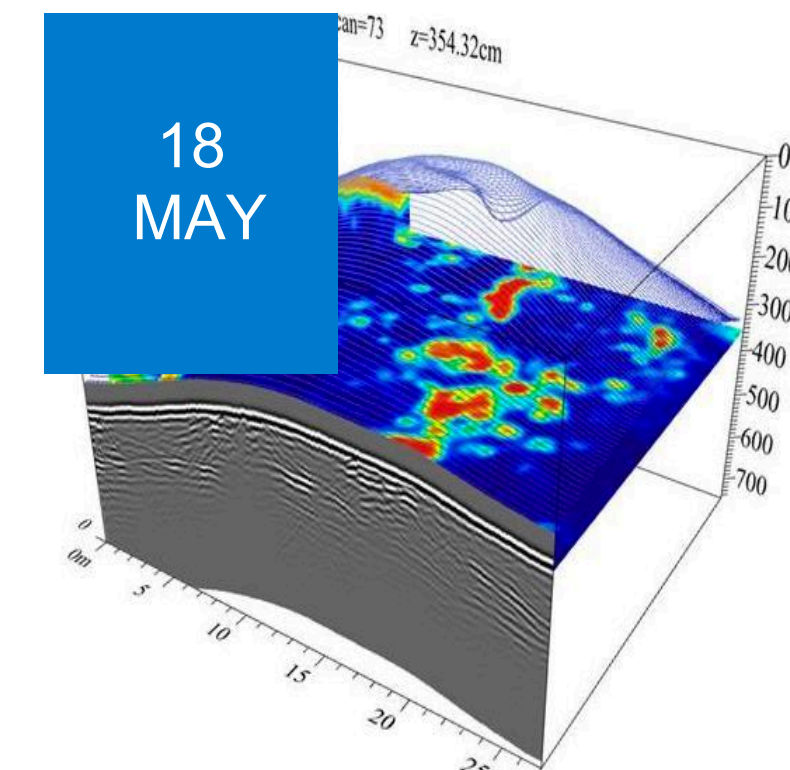
**Practical sessions  
in San Pietro in  
Vincoli Church**



17  
MAY

## DAY 4

**Practical sessions  
in Pyrgi  
Etruscan port  
and sanctuary**



18  
MAY

## DAY 5

Data processing  
and interpretation

A look at other  
applications of  
GPR

Free software tools  
for GPR



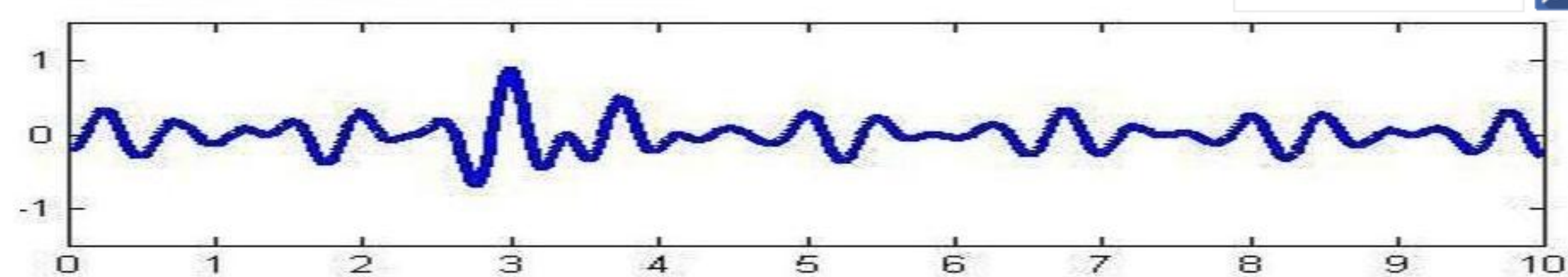
02

**Associazione Italiana del Georadar**



# Website: [www.gpritalia.it](http://www.gpritalia.it)

## GPRitalia - Associazione Italiana del Georadar



HOME

CHI SIAMO ▾

INTRODUZIONE AL GPR ▾

EVENTI ▾

VIDEO

LETTURE

ARCHIVIO ▾

CONTATTI

**Benvenuti!**

*Questo e' il sito ufficiale dell'Associazione Italiana del Georadar. Se desiderate iscrivervi all'Associazione potete consultare il campo "COME ISCRIVERSI" dal menu a tendina "CHI SIAMO". Se desiderate saperne qualcosa in più sulle nostre attività e finalità potete contattarci scrivendo ad [info@gpritalia.it](mailto:info@gpritalia.it). Saremo lieti di rispondervi.*

### ACCESSO UTENTI

Nome utente

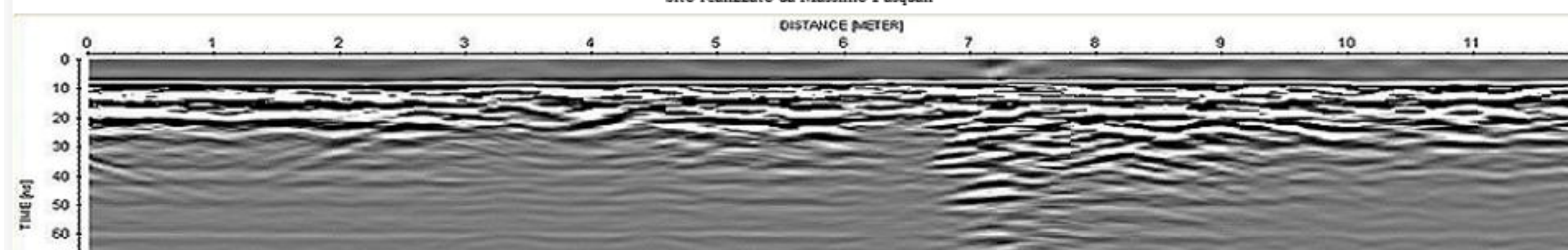
Password

☐ Ricordami

[Nome utente dimenticato?](#)

[Password dimenticata?](#)

Sito realizzato da Massimo Pasquali





# Overview: Participants



■ 34 Members from 2 countries



5 universities

3 research centres

1 foundation

7 private companies

8 private professionals



# Benefits for Members

---

- ✓ **Events discounted or for free**
- ✓ **Video-lessons on line**
- ✓ **Participation to the life of the Association  
with right of vote**

# Expenses

---

✓ **Website management and domain**

✓ **Events**

✓ **Accountant**

✓ **Taxes**

✓ **Bank expenses**



# Incomes

---

✓ **Registrations to events**

✓ **Sponsorships**

✓ **Registrations to the Association**

**30 € for temporary workers or retired people**

**50 € for permanent workers**

**250 € + VAT for companies**

# Events

---

- ✓ **National School in Potenza 16-17 May 2017**
  - ✓ **National School in Florence 28-29 November 2017**
  - ✓ **National School in Bari 10-11 February 2018**
- Future work:** Training School on Ground Penetrating Radar for Civil Engineering and Cultural Heritage Management, Rome 14-18 May, 2018.



# Contacts

1

## **TU1208 GPR Association**



Website  
[www.gpradar.eu/tu1208](http://www.gpradar.eu/tu1208)



Email  
[info@gpradar.eu](mailto:info@gpradar.eu)

TU1208

2

## **Associazione Italiana del Georadar**



Website  
[www.gpritalia.it](http://www.gpritalia.it)



Email  
[info@gpritalia.it](mailto:info@gpritalia.it)

ASSOCIAZIONE  
ITALIANA  
DEL GEORADAR