

**COST Action TU 1405 – GABI PhD Training Course**  
**Shallow geothermal energy for buildings and infrastructure**  
**7, 8 and 9 March 2018**

**DESCRIPTION**

Despite construction of energy geostructures in Europe, the development of specific design procedures and dimensioning approaches has been slow. Attempts to provide a set of recommendations for piles, diaphragm walls and tunnels subjected to temperature variations were carried out starting from 2005 in Switzerland, Germany, United Kingdom and France. However, most of this documentation provides only general indications and does not allow the adoption of this technology across Europe for a wider range of projects.

This training course organised by the **COST ACTION TU1405 GABI** (Geothermal Applications for building and infrastructures) aims to synthesize research and practice-based knowledge from across national and disciplinary boundaries in order develop better understanding and more widespread use of this technology.



**AIMS AND LEARNING OUTCOMES**

The course is valuable for PhD students in need of a global overview of the last key topics for the development shallow geothermal energy. Theoretical and practical courses are alternatively given by engineers and researchers involved in the **COST ACTION TU1405 GABI**.

At the end of the course, the PhD student should:

- Understand how legal, economic, thermal and mechanical issues interfere in the development of shallow geothermal systems,
- Have knowledge of the different steps for the design of a shallow geothermal system,
- Understand the thermal and mechanical interactions between shallow geothermal systems and their environment at different scales,
- Be able to present and discuss their PhD project in this context.

## VENUE

The training course is organised in Alexandroupolis at the Ramada Plaza Thraki Hotel (4<sup>th</sup> km Alexandroupolis-Thessalonikis, Alexandroupoli, 68100, Greece).

## SELECTION PROCEDURE

PhD students interested in this training course should send their CV (2 pages) and a list of publications to the following email addresses: [sebastien.burlon@ifsttar.fr](mailto:sebastien.burlon@ifsttar.fr) (Sébastien Burlon, Chair of the COST ACTION TU 1405 GABI) and [ktsagar@env.duth.gr](mailto:ktsagar@env.duth.gr) (Kostantinos Tsagarakis, Chair of the training course).

## FUNDINGS

Selected PhD students travelling to Greece from abroad will be funded with a scholarship of **650 €** for travel and accommodation, while PhD students from Greece will be funded by **350 €**.

## IMPORTANT DATES

9<sup>th</sup> October 2017: GABI training course announcement

10<sup>th</sup> November 2017: Applications received – Deadline for application submission

27<sup>th</sup> November 2017: Applicants reviewed and first selection of candidates announced

## PROGRAMME OUTLINE

### DAY 1

- 9.00-10.00: Registrations  
10.00-11.00: Meet together  
*11.00-11.30: Coffee break*  
11.30-13.00: Presentation of trainees  
*13.00-14.00: Lunch*  
14.00-17.00: Site visit  
*19.30-22.30: Social event – Dinner*

### DAY 2

- 9.00-9.30: Introduction to renewable energy sources  
9.30-10.00: Introduction to shallow geothermal energy  
10.00-11.00: Economic and social aspects of shallow geothermal energy  
*11.00-11.30: Coffee break*  
11.30-13.00: Legislation issues  
*13.00-14.00: Lunch*  
14.00-15.00: Building Energy Demand  
15.00-16.00: Heat Pumps  
*16.00-16.30: Coffee break*  
16.30-17.15: THM ground properties  
17.15-18.00: Measurements of THM ground properties (laboratory and in situ tests)

### DAY 3

- 9.00-10.00: Thermal design of piles  
10.00-10.45: Thermal design of diaphragm walls  
10.45-11.30: Thermal design of tunnels  
*11.00-11.30: Coffee break*  
11.30-13.00: Mechanical design of piles  
*13.00-14.00: Lunch*  
14.00-15.00: Mechanical design of diaphragm walls  
15.00-16.00: Mechanical design of tunnels  
*16.00-16.30: Coffee break*  
16.30-17.30: Execution and Monitoring  
17.30-18.30: Discussions – Conclusions