DELIVERABLE D8.7
SECOND GEOTHERMAL WEEK SCHOOL ORGANISATION
WP8: COMMUNICATION, DISSEMINATION AND EXPLOITATION

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PUBLIC SUMMARY

This report presents a detailed summary of the activities led by the GEC Laboratory (CY Cergy-Paris Université, France) for the preparation, management and realisation of the second geothermal week, the “Geothermal Winter School 2021”, organized in the frame of Work Package 8 of the H2020 MEET Project.
This event was fully online and took place between the 15th and 19th of February, 2021 on Zoom with a dedicated web platform that enabled to give access to the lectures. The audience of this high-standard training program was made of 170 registered participants, composed of master and PhD students, postdoctoral fellows, junior or senior subsurface engineers, and junior or senior researchers.
Several kinds of exchanges were proposed to the participants: 1) Geothermal demonstrations sites on key European projects, 2) Virtual site visits of geothermal plants, 3) a public webinar on geothermal communication to popularize geothermal energy, and 4) 16 lectures organized in 3 thematic sessions, including 4 keynote lectures.
The training school was co-organized with the 12th edition of the European Geothermal PhD Days, which took place the two first days of the week, on the same web platform.

1 EXECUTIVE SUMMARY

1.1 DESCRIPTION OF THE DELIVERABLE CONTENT AND PURPOSE

This public deliverable D8.7, entitled “Second geothermal week school organisation”, has been achieved by CY Cergy Paris Université (CYU) in the framework of the WP8 of the MEET project.
The second geothermal school was organised in order to allow MEET participants to share their experience obtained during the first 36 months of the project and to learn more about geothermal energy, exploration and production thanks to the invitation of international experts on key topics. In addition, masters and PhD students involved in MEET and other geothermal projects at the European scale were invited to participate in this school to learn and share their results.
This training programme was organised based on contributions of specialists who contributed with various on-site results, courses and practice-oriented lectures about interdisciplinary geothermal topics.
This deliverable provides all the details of the organisation of the event and regarding the benefits and perspectives for the dissemination of the MEET results to the geothermal community and beyond.

1.2 BRIEF DESCRIPTION OF THE STATE OF THE ART AND THE INNOVATION BREAKTHROUGHS

University or qualifying courses in geothermal energy are very few in Europe and can be very expensive for students. They are either oriented towards the academic sector or focused on technical aspects.
The MEET geothermal school offers a new pedagogical approach by combining both a high quality of teaching and feedbacks from the H2020 MEET European project oriented towards the demonstration of new processes to increase the potential of existing geothermal power plants and to exploit new geothermal reservoirs. All lectures were intended to meet university standards, thanks to the intervention of research and development specialists from the academic and industrial environments, and keynote lectures.
The targeted students are registered in European universities within the MEET project's network of academic partners but also in universities participating in other European deep geothermal projects. This allows an exchange of knowledge within the project, but also between projects of different orientations in order to cover as broadly as possible the research and development on deep geothermal applications.

1.3 CORRECTIVE ACTION

IMPACTS OF COVID-19

Given the high effects of COVID-19 pandemic on trans-country mobility, the sanitary crisis took a crucial role in decision-making before the event. Given the size of the event with 25 lecturers, 170 registered participants and several CYU staff involved, the choice was made very early in advance (May 2020) to host the event virtually through an online platform.

1.4 IPR ISSUES

N/A

2 DELIVERABLE REPORT

2.1 CONTENT OF THE EVENT

The MEET Geothermal Winter School 2021 took place virtually from the 15th to the 19th of February, 2021 by CY Cergy Paris Université (CYU).

2.1.1 Thematics

This training programme was articulated around three themes that are common to the MEET project and responding to major issues of the geothermal community, which are:

1. Knowledge of deep geothermal heat & power in various geological settings;
2. Increase heat production, optimization of deep resources in oil wells and existing plants;
3. Promoting EGS across Europe, mapping best locations for future installations in Europe.

25 lecturers from inside and outside MEET consortium were invited to prepare practice-oriented lectures calling to this frame, according to their domain of expertise and their technical experiences. Among these scientists, 4 keynote lectures were planned to give insights on the following general topics:

1. Engineered Geothermal Energy Systems (EGS) in Europe, by Ernst Huenges (GFZ-Potsdam)
2. Deep fractured EGS - Concepts and reservoir assessment in the Upper Rhine Graben, by Albert Genter (ES-Géothermie and Coordinator of MEET project)
3. Social aspects for geothermal energy development and policy implications, by Adele Manzella (Consiglio Nazionale delle Ricerche - Istituto di Geoscienze e Georisorse)
4. Determining the key parameters and suitable measures for successful EGS developments, by David Bruhn (University of Delft – GFZ-Potsdam)

2.1.2 Audience

In total, 170 participants registered to the MEET Geothermal Winter School 2021.
The audience was composed of master / engineering students (68) and PhD students (58) in majority, but also by postdoctoral fellows (9), junior or senior subsurface engineers (17) and junior or senior researchers (18).

The participants were targeted in the graduate programmes of the MEET academic partners that are listed below:

- Master programme “GEOSEN” of CY Cergy Paris Université, France
- Reservoir engineering programme (4th year) of UniLaSalle, France
- Master programme “Geosciences” of University of Göttingen, Germany
- Master of Science “Applied Geosciences” of Technical University of Darmstadt, Germany
- Master of Science “Energy and Environment” of University of Zagreb, Croatia

From this list of partner universities, a total of 260 students were contacted.

Wishing to extend the visibility of this training programme and to provide a European platform for students from other geothermal projects, the choice was made to communicate extensively towards all research laboratories of European countries. A database of 278 research institutes was compiled and communication elements were sent to the heads of institutes. Consequently, 9 students enrolled in EU-funded projects and 61 participants (mostly students) from European research institutes registered to the MEET Geothermal Winter School 2021.

2.1.3 Demonstration sites and virtual site visits

To start the week with a practical experience, half a day of demonstration site presentations and virtual site visits was proposed to the participants. This afternoon was shared with the 12th edition of the European Geothermal PhD Days (see 2.2.1).

Regarding the demonstration site, it was meant to show how deep geothermal projects are currently going on in Europe and where are the key locations to demonstrate the feasibility of EGS and other forms of deep geothermal. To achieve this goal, four experienced scientists gave presentations of a specific project or area of interest:

- Upper Rhine Graben & Munich area, by Thomas Kohl (Karlsruhe Institute of Technology)
- Hydraulic soft stimulation of a geothermal well in Reykjavik, by Hannes Hofmann (GFZ-Potsdam)
- United Downs Deep Geothermal Project, UK, by John Reinecker (GeoThermal Engineering GmbH)
- Deep geothermal energy for district heating network - case histories in Paris Basin, by Christian Boissavy (G²H Conseils)

Virtual site visits were organised on several geothermal surface facilities in the Paris Basin and Upper Rhine Graben (URG):

- A first virtual visit was organised by Guillaume Ravier (ES-Géothermie) on the Soultz-sous-Forêts power plant and the Rittershoffen heat plant for industry, using the virtual tools of the company to navigate between the different components of the surface installations (Figure 1).
- A second virtual visit was planned with the exploiting company Engie-Solution on the geothermal heat plant of Dammarie-les-Lys, close to Melun city, Seine-et-Marne County, southeast of Paris (Figure 2). It was built in 2017 and it feeds the district-heating network. The communication team of Engie-Solution provided a recorded video of 10 minutes and an experienced technical manager, Jean-Marc Bertrand, came to answer questions of MEET partners and participants of the Winter School.
- A last virtual visit was prepared on the MEET test-site of the prototype Organic Rankine Cycle (ORC) device. This was set up with Vermilion and Enogia partners for the demonstration of project-made solutions to enhance geothermal reservoirs. Thus, a 40-minute recorded video was made to show students the pilot project, which was followed by an exchange with WP leaders Eric Léoutre and André-Charles Mintsa.

Figure 1: First virtual site visits took place on the Soultz-sous-Forêts power plant and Rittershoffen heat plant for industry, located in the eastern France, Upper Rhine Graben.

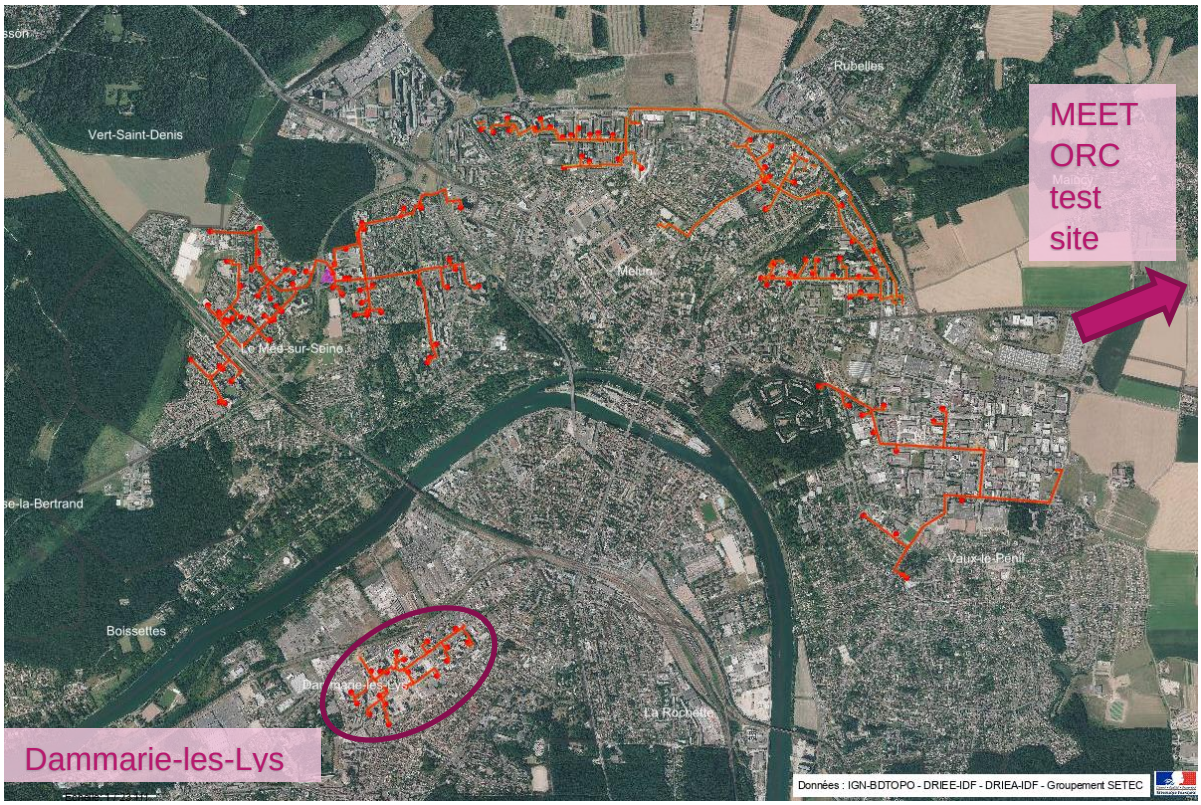


Figure 2: Geothermal district heating networks of the Melun city, Seine-et-Marne County, south-east of Paris. Two virtual visits took place on Dammarie-les-Lys heating network and MEET ORC test site, located 15 km northeast of Melun.

2.1.4 Public webinar

An introductory lecture was organized for the public to popularize geothermal energy to a broad audience all-over Europe, with an emphasis on communication strategies to extend geothermal knowledge from the technical actors to the non-expert citizens in order to bring local communities in geothermal project development. This course was disseminated throughout Europe during a webinar.

Iain Stewart, Professor of Geoscience Communication at University of Plymouth (formerly Director of the Sustainable Earth Institute), holding the Jordan-UK El Hassan bin Talal Research Chair in Sustainability at the Royal Scientific Society of Jordan, accepted to handle this challenging task, given his strong research background in communication issues regarding the subsurface, among which geothermal energy. He especially collaborated with the BBC channel in making documentaries on Earth during more than 12 years.

This initiative for openness, as a major goal of the MEET project for geothermal dissemination, was intended to provide an accessible but informative lecture to the broadest range of people in Europe potentially interested in geothermal energy as a promising renewable energy, from high-school students to public decision-makers in Europe.

2.1.5 Lectures

The lectures were organized according to three main thematic sessions of the Geothermal Winter School (Figure 3 and ANNEX 1: Detailed program).

Before starting, a first lecture dealing with EU funding mechanisms for early research careers was proposed by Ayming partner in order to cover all forms of public opportunities to finance research at European scale.

The public webinar was the introductory lecture of the program on geothermal oriented topics (see 2.1.4).

For the three thematic sessions, 16 lectures were given to the participants, 8 of them for the first thematic “Deep geothermal Heat & Power in various geological settings”, 5 of them for the second thematic “Increase heat production: optimization of deep resources” and 3 of them for the third thematic “Promoting EGS across Europe, mapping best locations for future installations in Europe”.

The MEET consortium was very active in the preparation of the pedagogical content since 14 lectures were given by project partners, who also organized 2 virtual site visits.

2.1.6 Session of young researchers

A specific session of presentations for young researchers was planned at the end of each day, in addition to the lectures, allowing students in connection with applied projects, such as MEET or other European geothermal projects, to promote their research work during a 30 minutes talk.

Many students were interested in this initiative and 20 of them submitted an abstract, which was shared with all students on the online platform.

These presentations were set up to fit the thematic framework of the week and organised according to the daily topics.

2.1.7 Full program

The final program was released several weeks in advance to the participants and lecturers. It is presented below in Figure 3 and is detailed in the ANNEX 1: Detailed program.

	European Geothermal PhD Days 2021				MEET Geothermal Winter School 2021					
	Monday 15/02		**Tuesday 16/02**		**Wednesday 17/02**		**Thursday 18/02**		**Friday 19/02**	
08:30	**Introduction**				**Introduction**					
08:45										
09:00	Session 1 Reservoir geomechanics and reservoir management	**Keynote: Brice Lecampion** (EPFL) Fundamentals in fluid flow and geomechanics for sustainable geothermal reservoir developement and management	Session 4 Modeling of geothermal processes	**Keynote: Inga Berre** (University of Bergen) Modelling of fault slip in hydraulic stimulation of geothermal reservoirs: governing mechanisms and process-structure interaction		**Fabienne Brutin** (Ayming) Boost your researcher career with EU funds		**Béatrice Ledésert & Ronan Hébert** (CY Cergy Paris Université) Fractures and hydrothermal alterations: a review of fluid pathways for geothermal applications	Increase heat production: optimization of deep resources	**Eléonore Dalmais** (ES-Géothermie) Optimization of energy valorization on EGS plant, application to Soultz-sous-Forêts demo-site
09:30										
10:00		PhD flash presentations Session 1		PhD flash presentations Session 4		**Public Webinar: Iain Stewart (University of Plymouth, Director of Sustainable Earth Institute)** Taking the Heat Out Of Geothermal: Geo-energy Communications for Publics and Policy		**Ghislain Trullenque** (UniLasalle) Death Valley granites as analogue of EGS Soultz-sous-Forêts reservoir		**André-Charles Mintsa** (ENOGIA) ORC technology and implementation in different geological contexts
10:30										
11:00		Poster discussion Session 1 **9 posters**		Poster discussion Session 4 **12 posters**		**Keynote: Ernst Huenges** (GFZ) Engineered Geothermal Energy Systems in Europe	Deep geothermal Heat&Power in various geological settings	**Yves Vanbrabant** (Geological Survey of Belgium) The role of anisotropy in geothermal systems in meta-sedimentary rocks		**Vincent Lanticq** (FEBUS Optics) Fiber optics, an adaptable and cost-effective technology for monitoring geothermal reservoirs at different scales
11:30										
12:00	Lunch		Lunch		Lunch		Lunch		Lunch	
12:30										
13:00	Session 2 Earthquake mechanics / Session 3 Faults characteristics and properties	**Keynote: Serge Shapiro** (Freie Universität-Berlin) Seismic Hazard Induced by Production of Hydrocarbon and Geothermal Energy	Geothermal demosites / EGPD & MEET	**Thomas Kohl** (KIT): Upper Rhine Graben & Munich area	Deep geothermal Heat&Power in various geological settings	**Keynote: Albert Genter** (ESG) Deep fractured EGS - Concepts and reservoir assessment in the Upper Rhine Graben		**Bernd Leiss** (Universität Göttingen) An unorthodox exploration and exploitation strategy for the development of an unconventional geothermal reservoir – the	Promoting EGS accross Europe	**Keynote: Adele Manzella** (CNR - IGG) Social aspects for geothermal energy development and policy implications
13:30				**Hannes Hoffman** (GFZ): Hydraulic soft stimulation of a geothermal well in Reykjavik						
14:00		PhD flash presentations Session 2 & 3		**Lucy Cotton** (GeoSciences Limited): United Downs Deep Geothermal Project, UK		**John Reinecker** (Geothermal Engineering GmbH) Exploration workflow for deep geothermal systems	Increase heat production: optimization of deep resources	**Ivan Rasjl** (UNIZG-FER) Site-specific environmental and economic assessment of EGS using Decision-Making Tool (DMT)		**Keynote: David Bruhn** (GFZ - TUDelft) Determining the key parameters and suitable measures for successful EGS developments
14:30				**Christian Boissavy** (G^2H Conseils): Deep geothermal energy for district heating network - case histories in Paris Basin						
15:00		**Keynote: Thomas Mitchell** (University College London)				**Kristian Bär** (Technische Universität Darmstadt) Planning reservoir stimulation, technical steps and risk mitigation		**Eric Léoutre** (VERMILION Energy) Co-production of oil and geothermal heat: opportunities and challenges		**Bianca Wagner** (Universität Göttingen) Concepts and data sources for mapping deep geothermal resources throughout Europe
15:30			Break							
16:00		Poster discussion Session 2 & 3 **13 posters**	Virtual site visits / EGPD & MEET	**Guillaume Ravier** (ESG) Rittershoffen heat plant for industry and Soultz-sous-Forêt power plant (Rhine Graben, France)	Break		Break		Break	
16:30					Open-room sessions representatives of companies and research institutes	Young european researchers in geothermal: **Akos Kiss** (Univ. Durham)	Open-room sessions representatives of companies and research institutes	Young european researchers in geothermal: **Armand Pomart** (UniLasalle)	Young european researchers in geothermal	**Edoardo Pezzulli** (ETHZ)
17:00	Break			**Jean-Marc Bertrand** (ENGIE Réseaux) Dammarie-les-Lys plant for district heating (Paris basin, France)		**Aurore Laurent** (Univ. Lille)		**Martha Nnko** (TU Delft)		**Anvar Farkhutdinov** (Bachkir State Univ.)
17:30	General Session Other geothermal topics	PhD flash presentations General Session				**Cédric Bailly** (CYU)		**Lei Wang** (GFZ)		**Lily Suherlina** (TU Delft)
18:00				**Eric Léoutre & André-Charles Mintsa** (VERMILION Energy & ENOGIA) ORC site visit at Chaunoy (Paris basin, France)		**Ines Raies** (IFPEN / CYU)		**Chaojie Cheng** (GFZ)		**Francisco Porturas** (Peruvian Geothermal Association)
18:30		Poster discussion General Session **13 posters**				**Katherine Ford** (Univ. Göttingen)		**Aysegül Turan** (TU Darmstadt)		**Ana Soles Valdivia** (Independent)
19:00				**Conclusion**		**Gemma Mitjanas** (Univ. Barcelona)		**Maxime Catinat** (Univ. Paris-Saclay)		**Philipp Schröer** (Univ. Ruhr-Bochum)
19:30						**Johanne Klee** (UniLasalle)		**Saeed Mahmoodpour** (TU Darmstadt)		**Conclusion**
20:00										

Figure 3: Program of the MEET Geothermal Winter School 2021.

2.2 ORGANIZATION OF THE EVENT

2.2.1 Co-organisation with the European Geothermal PhD Days 2021

As announced in the Deliverable D8.6, the MEET geothermal school was jointly organised online with the **European Geothermal PhD Days (EGPD) 2021**, in collaboration with Université de Neuchâtel (UNINE, Switzerland), during the same week.

It took place the two first days of the week (15th-16th of February 2021).

The EGPD gathers about 50 to 80 PhD students each year since 2009 and intends to "connect PhD researchers all over Europe that are working in the field of geothermal energy". These young scientists are working on many different research fields such as geology, geochemistry, rock mechanics, geophysics and mechanical engineering.
Traditionally, guest lecturers give oral presentations and PhD students are asked to submit an abstract to present their projects in poster sessions during the conference.
The EGPD has been hosted in many European countries in the past decade, but it is the first time it has been organised in France.

As the organising committee has to be composed of PhD students in geothermal and CYU hosts 1 part-time PhD candidate in this domain, CYU proposed to associate PhD candidates of Université de Neuchâtel, who accepted to co-organise the event. The Center for Hydrogeology and Geothermics, and more specifically the Geothermics and Reservoir Geomechanics laboratory prepared the EGPD 2021 with CYU. PhD students from UNINE (Neuchâtel) were in charge of organizing work sessions based on the abstracts received. CYU organized the logistic part of the event (management of the virtual event, coordination of all numerical tools, organisation of the virtual tour of geothermal installations shared with MEET Geothermal Winter School).

This joint event of MEET Geothermal Spring School 2021 and European Geothermal PhD Days 2021 represented a chance for PhD students to follow a week of intense knowledge sharing and promotion. Indeed, students had the opportunity to follow keynote lectures, conferences, practice-oriented courses, poster sessions, young researcher presentations and a half-day of site visits that was common to both events.

2.2.2 Virtual event

The event was entirely virtual and was hosted on the PhDTalent web platform, designed for this purpose, and based on Zoom infrastructure.
The link of the virtual event is as follows: https://app.phdtalent.fr/events/european-geothermal-phd-days-2021-meet-geothermal-winter-school-2021-2_962/details.

PhDTalent platform was thought as a compact view of the event, in order to facilitate the connection of the participants to Zoom, according to the program.

The interface of the platform consisted in different elements:

- The presentation of the event (Figure 4), with the event information (dates, organizers, type, location), the description of the event, the partners involved in the organization, and the sponsors of both events (EGPD 2021 and Geothermal Winter School);
- A section for the public and private exhibitors that were invited to join the event (Figure 5);
- And the program for each day, on which participants could find the whole set of content that they could register to, and that proposed a complete view of each content with the “Information” button as shown on Figure 6 (summary of the lecture, abstract of the poster/presentation for young researchers, description of the visits, PDF links to the abstracts and posters).

- In addition, participants could have access to more functions, such as the possibility to find all their registered lectures in the “My Planning” section (Figure 7) and to use the networking tool (Figure 8 and Figure 9), in order to connect with the 303 attendees registered on the PhDTalent platform.

The design of the platform was adapted by the PhDTalent team to the specificities of the event, like the poster sessions of the EGPD 2021, but also the continuous program of the demonstration sites, virtual site visits and thematic sessions.

Indeed, the online event was based on the Zoom infrastructure of PhDTalent, which consisted in 300 people meeting format for poster sessions (10-13 parallel Zoom meetings for each poster), 500 people webinar format for each 1 hour lecture, and 1000 people webinar format for the public webinar. As this type of organization required to switch from webinar to webinar or meeting at the end of each presentation, which was fine for the EGPD 2021 but not for a continuous conference format planned for the Geothermal Winter School, PhDTalent managed to propose a full-day 500 people webinar type in order to keep the audience connected during the whole day.

As Zoom was the connecting media for all the participants to join the event, they were all warned that they needed to ensure a stable access to Zoom through the desktop or browser interface and with a fast internet connection.

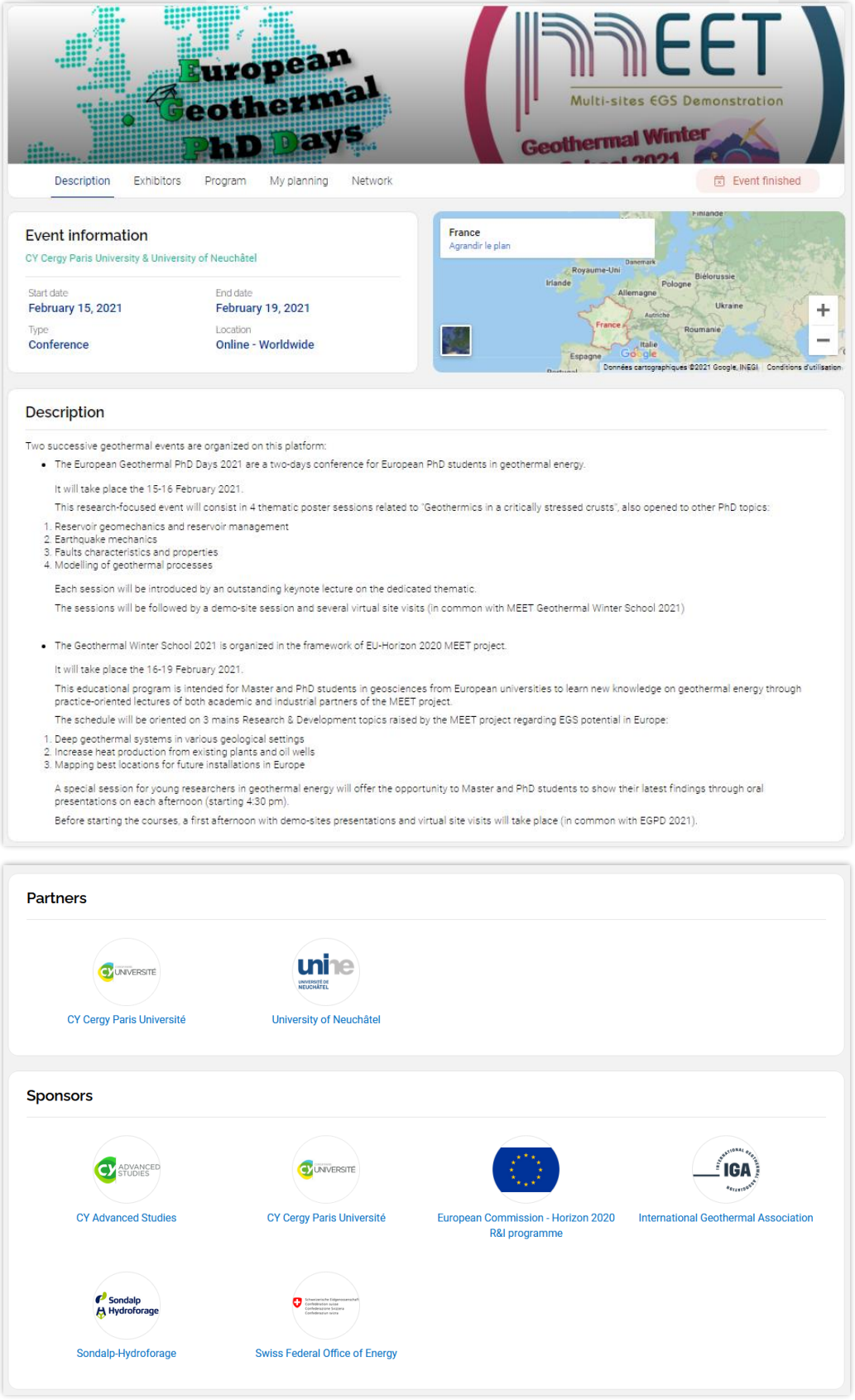


Figure 4: General view of the PhDTalent virtual platform dedicated to the geothermal week.

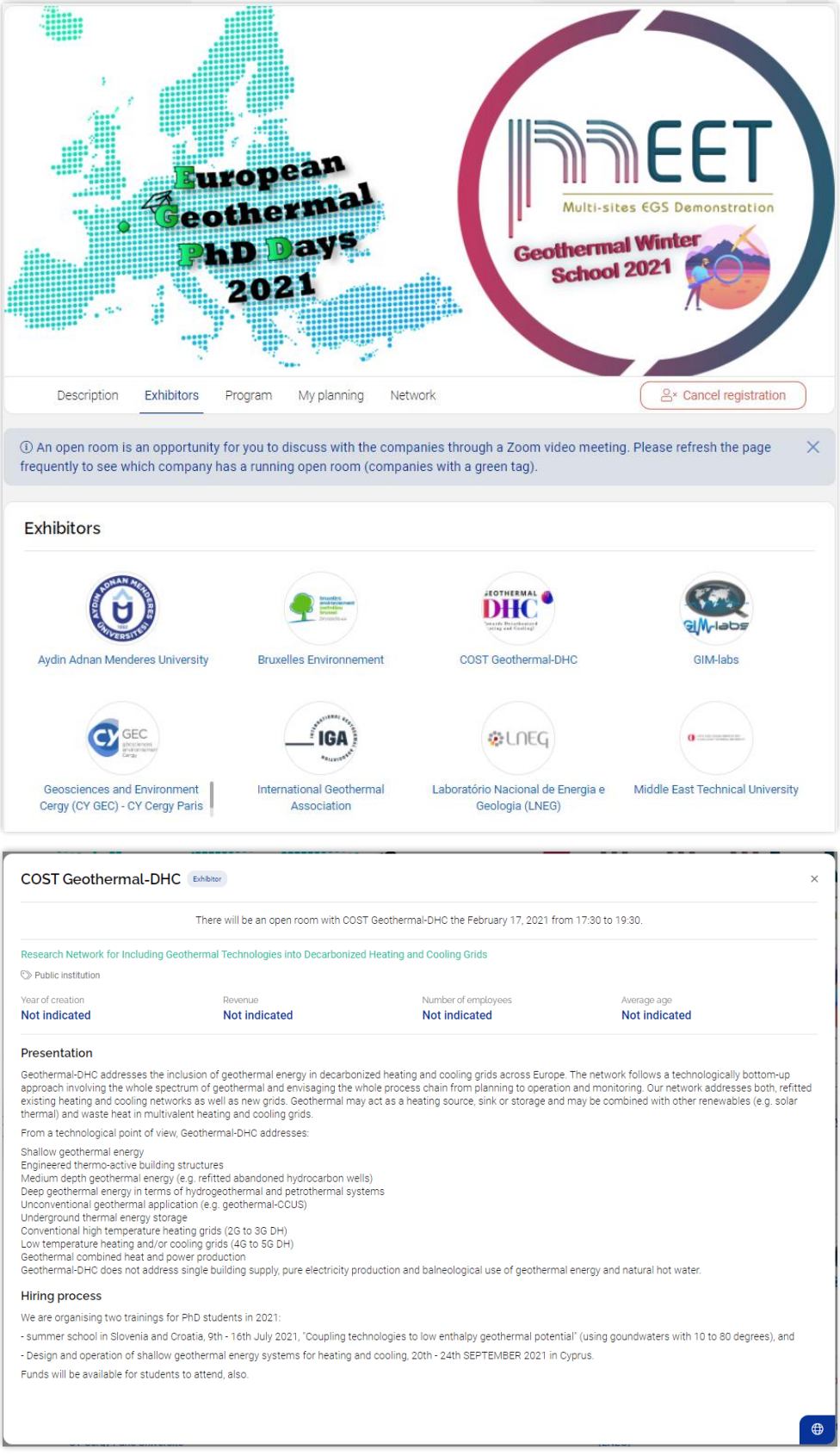
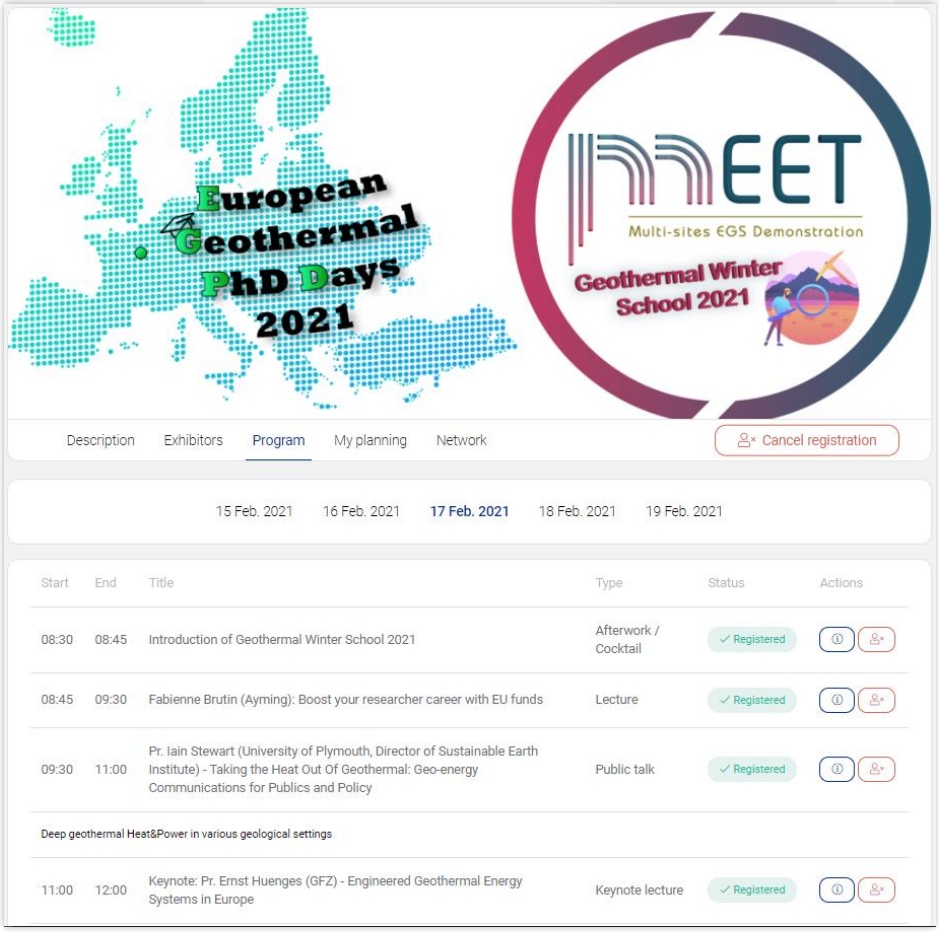


Figure 5: "Exhibitor" section of the PhDTalent platform.



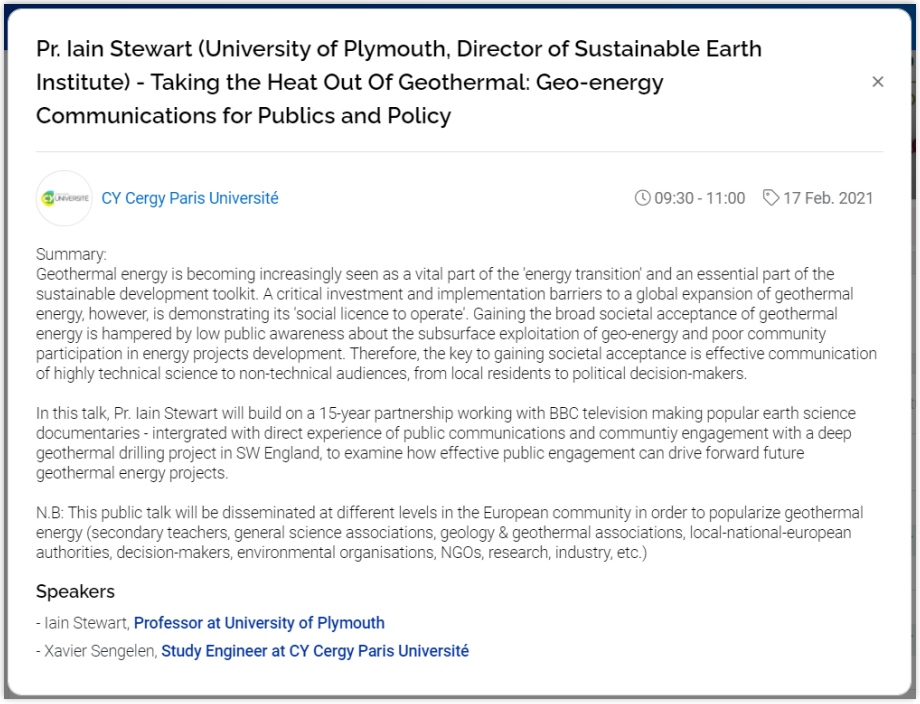


Figure 6: "Program" section of the PhDTalent platform, with all content by dates, showing session titles, lecture titles, content type, and actions (information button, as displayed in the lower part of the figure, and registration button).

Figure 7: "My planning" section of the PhDTalent platform, for the participants only.

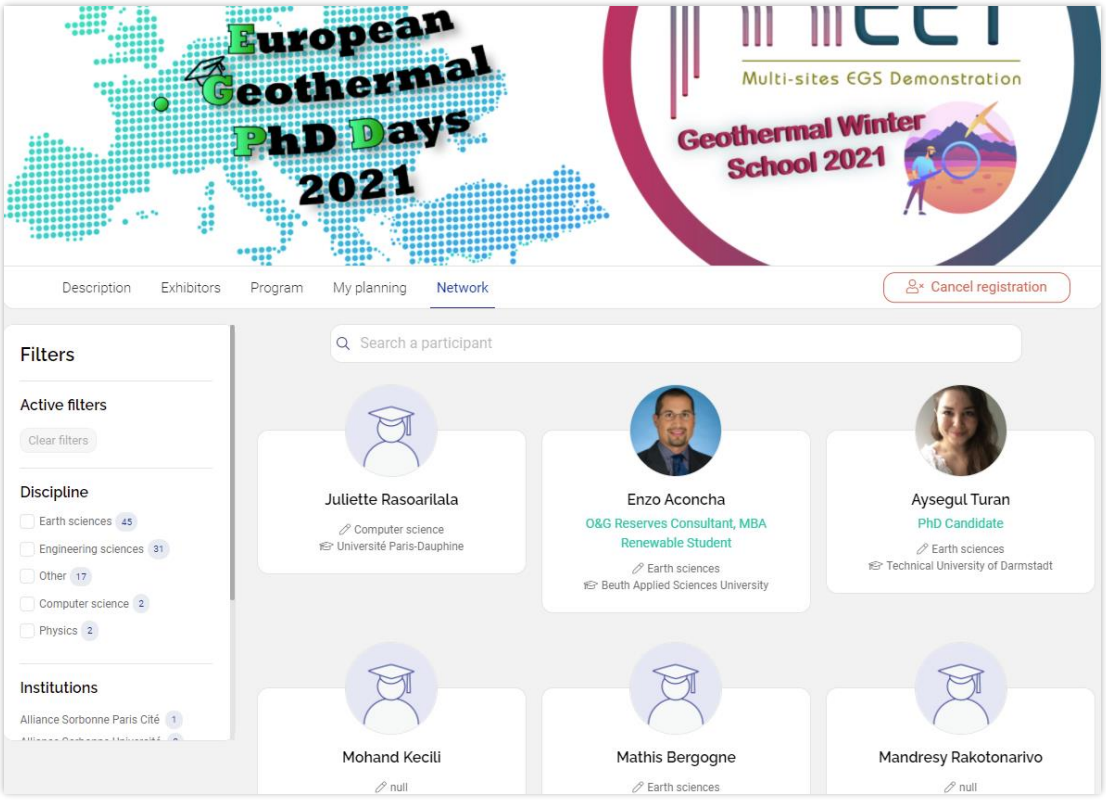


Figure 8: "Network" section of the PhDTalent platform, for the participants only.

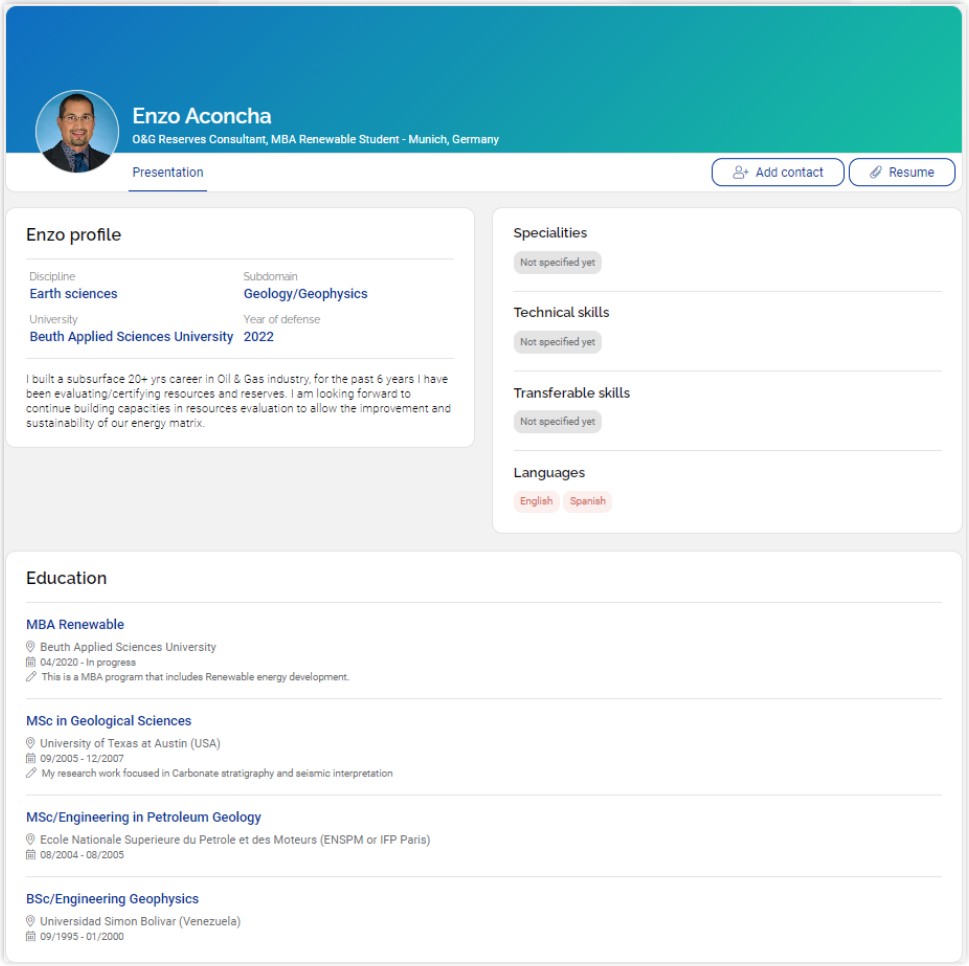


Figure 9: Example of a personal profile from one of the participants.

2.2.3 Communication

The communication of the event was a continuous process from the announcement to the MEET consortium on the 26th of June 2020 to the closure of the event on 19th of February 2021.

2.2.3.1 Announcements

Different steps of announcement and reminders occurred during the period with the following most important communication messages:

- **26th of June 2020**: announcement of the MEET Geothermal Winter School to the MEET consortium;
- **17th of September 2020**: announcement of the MEET Geothermal Winter School to the administration of CY Cergy Paris Université;
- **3rd of November 2020**: announcement of MEET Geothermal Winter School and EGPD 2021 to European research institutes, and statement of important deadlines;
- **13th of November 2020**: announcement of MEET Geothermal Winter School and EGPD 2021 to the European geothermal community, and statement of important deadlines;

- **16th of November 2020**: announcement of MEET Geothermal Winter School and EGPD 2021 to the EU and National geothermal project managers, and statement of important deadlines;
- **11th of December 2020**: announcement of the finalized program of both events to the MEET consortium;
- **15th of January 2021**: announcement of the MEET Geothermal Winter School on CY Advanced Studies website
- **3rd of February 2021**: announcement of the MEET Geothermal Winter School and EGPD 2021 to the members of CY Cergy Paris Université.

2.2.3.2 Invitation of lecturers

Lecturers were contacted several times for composing the program of the week.

For the Geothermal Winter School, lecturers from last edition were invited to give the lecture they could not provide last year due to COVID-19 pandemic. 16 speakers responded positively but several left time slots needed the organization team to prospect for other speakers. New invitations were sent for demonstration sites (new session decided for this year), for one keynote lecture and for the public webinar.

For EGPD 2021, as soon as the scientific program was set, invitations were sent to 4 potential speakers by the PhD students of CYU and Université de Neuchâtel in charge of the organization.

For both events, a continuous exchange was necessary to collect the titles and summaries of the lectures, but also the pre-recording of their lectures in video format, in case the lecturers would have had issues about their internet connection, or in case of late-stage absence.

2.2.3.3 Exchange with participants

The contribution of students was key to success in this event. Therefore, the opportunity was offered to students to prepare posters or oral presentations, which were held during dedicated sessions. So, besides the official information related to the organization of the event, deadlines and technical information were sent to them regarding different processes needed to ensure the good organization of the event:

- Abstract submission, with specific deadlines for the Geothermal Winter School and EGPD 2021
- Preparation of posters and presentations (for the selected abstracts)
- Recording of their video for flash poster presentation (EGPD 2021) or oral presentation (Geothermal Winter School)
- Uploading of their files on CYU-hosted repositories.

In addition, several messages were sent to all participants (especially to those who did not want to participate in the poster and oral presentations) to remind them how and when the event would be taking place.

2.2.3.4 Communication with lecturers and participants through the virtual platform

A statement was sent to all registered participants and to the lecturers about the URL access to the virtual PhDTalent platform (see 2.2.2).

As the program was composed on the PhDTalent platform by administrators of the event, lecturers were warned of the Zoom link to their webinar through automatic messages. On the other side, the participants received automatic messages with links of the lectures as soon as they registered to each content (in addition to the available button on “My Planning” section of PhDTalent - Figure 7).

PhDTalent also reminded all registered participants about the near opening of the geothermal week (2 weeks earlier and D-1).

Participants were also encouraged by PhDTalent to fill up their personal profiles on the platform, so that they could more easily get in contact with the people they were interested in (Figure 9).

At the end of the event, a greeting message was also sent by PhDTalent to finalize the communication with the participants.

2.2.3.5 MEET website and LinkedIn page

Publications were released on the MEET website and LinkedIn page.
The specific links are listed below:

- https://www.meet-h2020.com/meet-geothermal-winter-school-2021/
- https://www.linkedin.com/posts/meet-eu-project_meeteuproject-h2020-winterschool-activity-6743144068005605378-NuLB
- https://www.linkedin.com/posts/meet-eu-project_h2020-meeteuproject-school-activity-6767724551276179456-HIsG
- https://www.linkedin.com/posts/meet-eu-project_h2020-meeteuproject-school-activity-6768596603558277120-aV8D
- https://www.linkedin.com/events/meetgeothermalwinterschool202167522594120287477777/
- https://www.linkedin.com/posts/meet-eu-project_h2020-meeteuproject-school-activity-6755158679277899777-gvwk

2.2.3.6 CYU websites

In the same manner, several publications have been released locally on the websites of CY Cergy Paris Université, CY Advanced Studies and CY Doctorate School:

- https://iea.u-cergy.fr/fr/manifestations-scientifiques/conferences-et-workhops/geothermal-winter-school-2020.html
- https://www.cyu.fr/european-geothermal-phd-days-2021-et-geothermal-winter-school-du-projet-europeen-meet
- https://agenda.cyu.fr/european-geothermal-phd-days-2021-1
- https://www.adum.fr/script/formations.pl?mod=294772&site=CYcergy
- https://www.cyu.fr/webinaire-geo-energy-communication-avec-iain-stewart (link no longer accessible on the agenda, as it has past)
- https://www.u-cergy.fr/fr/laboratoires/laboratoire-gec/actualite.html (link no longer accessible, as CY Cergy Paris Université changed its website)

2.2.3.7 Posts in the geothermal community

Another way to communicate on the event was to reach the international geothermal community through specialized geothermal news channels. The most influential, ThinkGeoEnergy (media of the International Geothermal Association) wrote several articles about the Geothermal Winter School, as listed below:

- https://www.thinkgeoenergy.com/12th-european-geothermal-phd-days-geothermal-winter-school-feb-2021/
- https://www.thinkgeoenergy.com/meet-geothermal-winter-school-2021-events-feb-15-19-2021/
- https://www.thinkgeoenergy.com/virtual-tour-of-geothermal-heat-plant-dammarie-les-lys-france/

Other posts were also released within the geothermal community, showing a real fad for the event:

- European Geothermal Energy Council: https://www.egec.org/events/meet-geothermal-winter-school-2021/
- European Federation of Geologists: https://eurogeologists.eu/event/virtual-geothermal-winter-school-2021/
- UPGEO project: http://hebergement.universite-paris-saclay.fr/upgeo/?p=297
- GeoPlat (Spanish technological and innovation platform in geothermal energy): https://www.geoplat.org/evento/meet-geothermal-winter-school-2021/
- PIXIL project (Pyrenees Imaging eXperience: an InternationaL network): https://pixil-project.eu/en/media/eventos/geothermal-winter-school-2021
- ENeRAG project (Excellency Network Building for Comprehensive Research and Assessment of Geofluids): http://enerag.elte.hu/index.php/2021/03/24/participation-in-the-european-geothermal-phd-days-egpd-and-winter-school/

In addition, a post was prepared by the French geothermal information website “Géothermies” of the ADEME (French agency for the Environment) and the BRGM (French geological survey):

- https://www.geothermies.fr/actualites/evenements/projet-europeen-h2020-meet-geothermal-winter-school (link no longer accessible on the agenda, as it has past)

And many LinkedIn posts were generated by the geothermal community to relay content of the Geothermal Winter School. For example, the video of the virtual site visits from Dammarie-les-Lys was advertised by ENGIE Solutions: https://www.linkedin.com/feed/update/urn:li:activity:6767490539064455168/

2.2.3.8 Campaign for the public webinar

An intense communication was done to promote the public webinar of the MEET Geothermal Winter School, with massive emailing from our partner PhDTalent.

A registration form was designed and sent to all contacts gathered by CYU partner in order to register to the webinar: https://phdtalent.typeform.com/to/aK6tpAz1
A reminder was sent 2 weeks earlier and the day before in order to register to the webinar.

The invitation for the webinar was sent to many different targets from an extensive database of CYU partner (Figure 10 and Figure 11). This compilation enabled to collect contacts all-over Europe from:

- 194 companies;
- 278 research institutes;
- 64 environmental agencies in Europe at national or EU scale (49 reference public agencies on environment from each country, and 15 reference agencies or representative European institutions dealing with environment issues at the EU scale);
- 57 geothermal & geological associations of all European countries (+ EU and worldwide);
- 29 associations of geology/biology teachers in secondary high-schools all-over Europe;
- local energy associations;
- federations of energy companies;
- networks of scientists (geography, biology, geology, general science);
- local authorities;
- syndicates of professionals;
- 34 NGOs at national, European or worldwide scale.

1387 persons were contacted by PhDTalent for this webinar, 169 individuals registered, and 153 effective participants joined the webinar, representing a conversion rate of 11.0% of the target, with 77.5 minutes median time spent online over the 95 minutes of the webinar.

The geothermal community had the opportunity to register to the webinar with the support of ThinkGeoEnergy media, with a post created several days before the event: https://www.thinkgeoenergy.com/webinar-geo-energy-communication-for-publics-and-policy-feb-17-2021/

Figure 10: Visual of communication email of the public webinar sent through massive emailing.

Taking the Heat Out Of Geothermal:

Geo-energy Communications for Publics and Policy

February 17, 2021

9:30-11:00 (CET)

Register now for the webinar, you will receive the link after your pre-registration

Register now!

Webinar Description:

Geothermal energy is becoming increasingly seen as a vital part of the 'energy transition' and an essential part of the sustainable development toolkit. A critical investment and implementation barriers to a global expansion of geothermal energy, however, is demonstrating its 'social licence to operate'. Gaining the broad societal acceptance of geothermal energy is hampered by low public awareness about the subsurface exploitation of geo-energy and poor community participation in energy projects development. Therefore, the key to gaining societal acceptance is effective communication of highly technical science to non-technical audiences, from local residents to political decision-makers.

In this talk, Pr. Iain Stewart will build on a 15-year partnership working with BBC television making popular earth science documentaries - intergrated with direct experience of public communications and communtiy engagement with a deep geothermal drilling project in SW England, to examine how effective public engagement can drive forward future geothermal energy projects.

Contact:
Xavier Sengelen
Project geologist - H2020 MEET geothermal project

Figure 11: Description of the public webinar sent through massive emailing.

2.2.3.9 Design of logos and flyer

The logos of both events were designed by CYU partner (Figure 12).

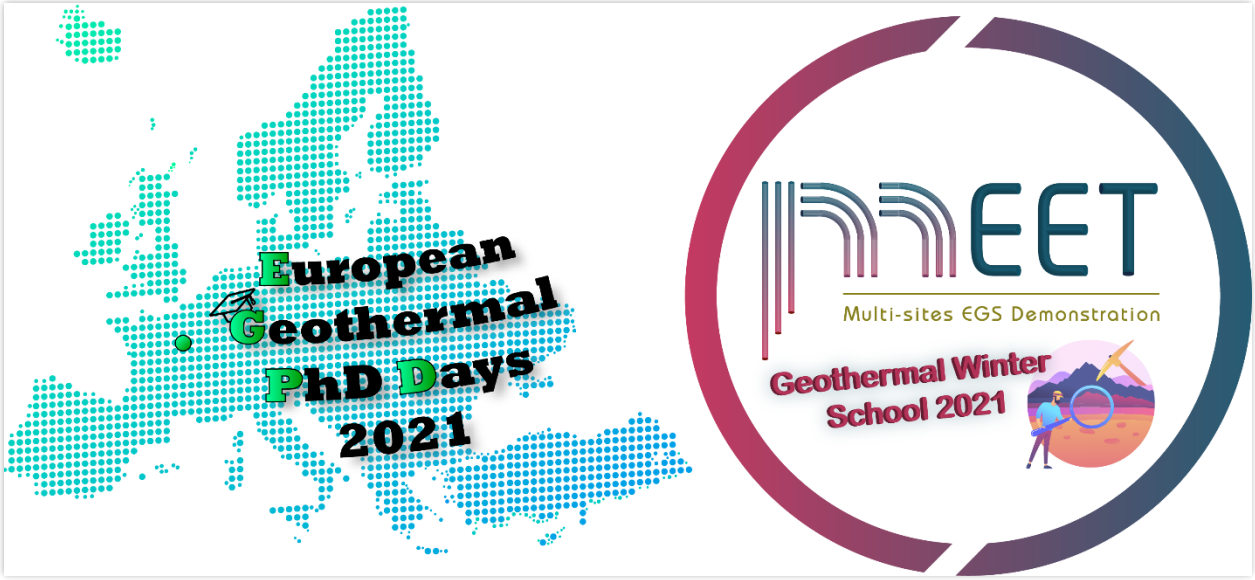


Figure 12: Logos of the European Geothermal PhD Days 2021 and Geothermal Winter School 2021.

Several visuals were produced to promote the Geothermal Winter School 2021 and EGPD 2021 (see ANNEX 2: Flyer, ANNEX 3: Flyer for the European Geothermal PhD Days 2021, ANNEX 4: Flyer for extended deadline of the EGPD 2021 and ANNEX 5: Invitation for public webinar).

Since autumn 2020, the flyers were released for MEET internal diffusion towards students from academic partners, as well as for European research institutes in geosciences and project managers of European geothermal projects. There were also made available on MEET project website, together with the program (Figure 3).

In winter 2020-2021, an invitation for the public webinar was designed for internal and external communication on CYU, event websites, geothermal media and LinkedIn.

In addition, Ayming partner communicated on MEET website and LinkedIn page based on that material (see 2.2.3.1).

2.2.3.10 Design of a presentation template for speakers

A PowerPoint template dedicated to the MEET Geothermal Winter School was designed (Figure 13) in order to incorporate several elements that were necessary regarding the project communication scheme.

The first slide showed the above right-hand side logo of the Geothermal Winter School (Figure 12), a training-type picture, the title and subtitle, as well as the EU flag together with the sentence referring to the EU-H2020 grant agreement. In the same manner, the last slide displayed the MEET logo, the Geothermal Winter School logo, possibly a logo of the speaker's institution and the EU flag together with the sentence referring to the EU-H2020 grant agreement.

Figure 13: Presentation template for the speakers.

2.2.4 Management of the event

2.2.4.1 Funding proposals

While the organisation of the Geothermal Winter School required a significant budget to handle logistical and digital costs, the grant received by CYU for the MEET project did not include a dedicated support for the WP8 - Task 8.3. Consequently, CYU had to answer several calls for funding the Geothermal Winter School 2021, both inside and outside the university.

Proposals were obtained from three different organisms that could provide grants for our project:

1. CY Doctorate School
2. CY Advanced Studies – Organisation of Scientific Manifestation
3. International Geothermal Association (IGA)

These fundings allowed CYU to obtain equity for covering all planned costs of the virtual event. The organisms asked to associate their logos on communication materials prepared for the event. Therefore, the program, PhDTalent platform and flyers were stamped with CY Cergy Paris Université, CY Advanced Studies and IGA logos alongside EU flag and MEET logo.

2.2.4.2 Exchange with participants, lecturers, and operators for site visits

As mentioned above, it was necessary to communicate extensively with students to explain one by one all the process, from registration to online meeting, in addition to the official emails sent to the whole batch of students. As students still registered very late and as we did not want to exclude new participants, it was needed to explain again all the process to people who did not receive the previous information.

The preparation of the program also required many back and forth email exchanges with all lecturers to reconcile personal schedules and thematic framework, but also to collect all lecture outlines needed for PhDTalent platform (see Figure 6), to collect back-up recordings in case of connection failure, and more importantly, to ensure that all speakers would have the necessary information to connect to Zoom properly. This effort was made since September 2020 and resulted in a coherent program and a detailed content for students several weeks before the start of the Geothermal Winter School, as planned.
It also resulted in a smooth succession of speakers, without breaks and without major late change in the schedule (except one lecturer who could not finally make it, but fortunately who could be replaced by a MEET partner on the exact same topic).

Many contacts were taken with internal and external partners for the virtual site visits, like energetic operators or industrial MEET partners, in order to plan the video shooting in close cooperation.

2.2.4.3 Online event

The online event was managed in close cooperation with PhDTalent team, with a retroplanning going from December 2020 to February 2021, combining platform design and creation, communication, accounting, and event preparation, which helped significantly to keep the main steps of organization in mind during the last months. The PhDTalent team was in back-up during the event, in case of any unexpected issue with Zoom or with the platform.

An internal team of CY Cergy Paris Université, composed of 4 people from the Geosciences & Environment laboratory (Béatrice Ledésert, Cédric Bailly, Christophe Barnes and Xavier Sengelen) managed the whole event, from the introduction, session chairing, speaker introduction, question & answer sessions after the presentations, time keeping, to the conclusion of the Geothermal Winter School. One or two people were in charge of each thematic session and gave introductory contexts and conclusion words.

The geothermal week was dense but with many kinds of content, all of very high-standard quality. From the keynote speakers on geomechanics and modelling, and poster sessions (with flash presentations) during the EGPD, to the presentations of demonstration sites, virtual site visits, public webinar, thematic lectures and sessions of young researchers during the Geothermal Winter School, a lot of geothermal knowledge was shared during this week. Some of the speakers who contributed to this program were captured to publish visuals after the event (Figure 14). All types of geothermal energies, from very shallow to deep reservoirs, low to high enthalpy, were covered. Also, it was a place for strong interactions between academics and industry, as the panellists were very diverse. Finally, either young and experienced scientists participated in this event, which contributed to a very fruitful learning week. The questions from the audience were constantly rising, for each presentation, which gave a nice emulation and certainly allowed future collaborations.

All in all, from many feedbacks received during and after the event, the Geothermal Winter School is a real success for the MEET project, even though organized in these pandemic times.

Figure 14: Group picture with logo for diffusion on social networks.

In order to keep track of these great scientific moments, group pictures were taken during the week and at the end of the week (Figure 14 and Figure 15). After a very intense week, many people stayed connected until the conclusion and we could take a final group picture (Figure 16).

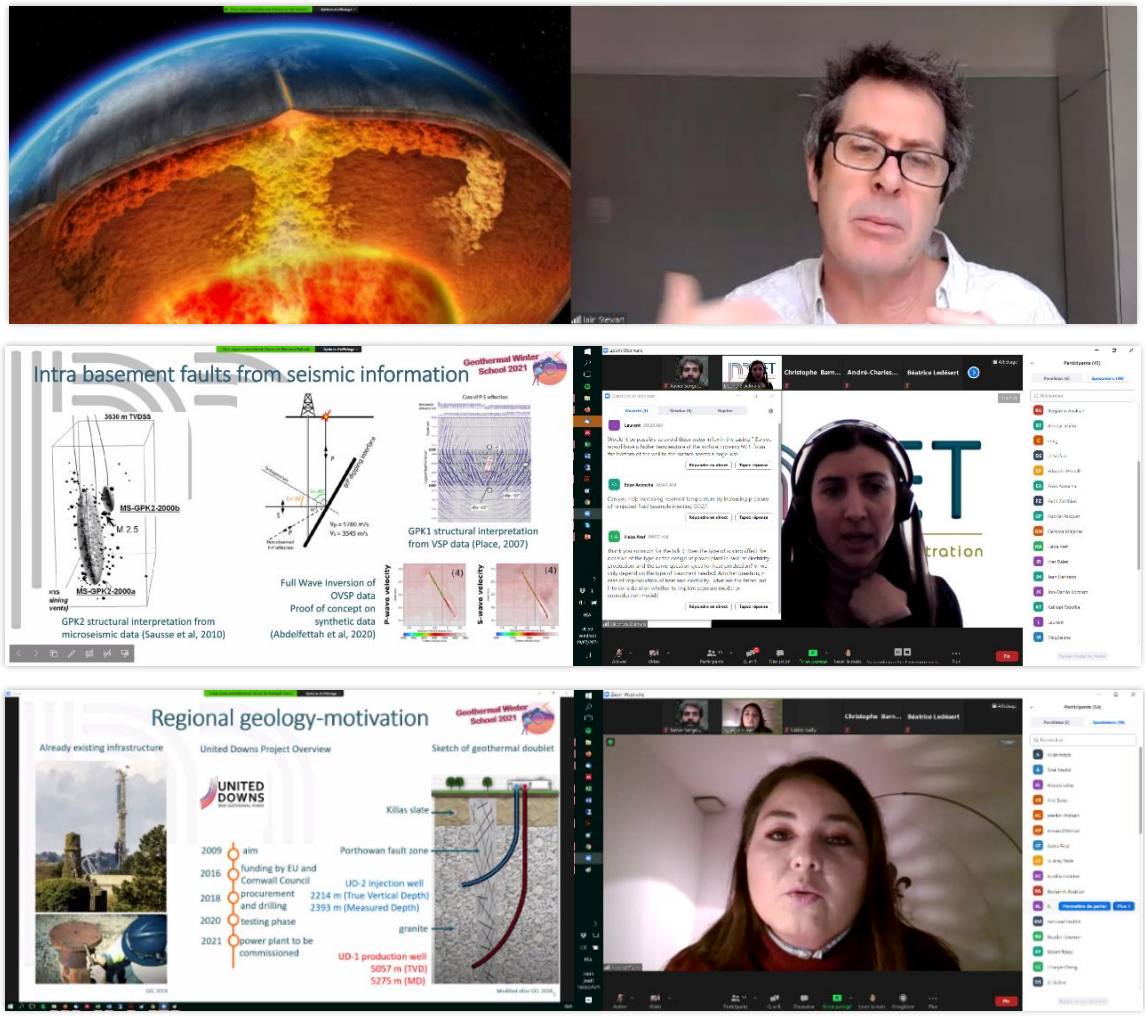


Figure 15: Example of pictures collected during the Geothermal Winter School.

Figure 16: Final group picture at the conclusion of the Geothermal Winter School.

2.2.4.4 Statistics

The measurement of the audience rate was supposed to be given by Zoom after the event. As most of the days were organized on a webinar mode during half a day for the demonstration site/virtual site visits, and during the full day for the 3 other days, the duration was too long for Zoom to provide the statistics. However, PhDTalent was able to collect several data to appreciate the attendance.

Firstly, PhDTalent provided the data extracted from the utilization of the web platform, and more specifically with the number of unique views during the week (Figure 17). The attendance was higher during the first 3 days, and decreased on the last 2 days. Even though the number of unique views does not reflect the real number of participants since every one of them could reach several pages to join Zoom, it is a relative method to estimate the success of the event.
A total of **1753** unique views were recorded for the full week, with the details for each day:

- **Monday** 15th February, 2021: **478** unique views
- **Tuesday** 16th February, 2021: **409** unique views
- **Wednesday** 17th February, 2021: **419** unique views
- **Thursday** 18th February, 2021: **239** unique views
- **Friday** 19th February, 2021: **208** unique views

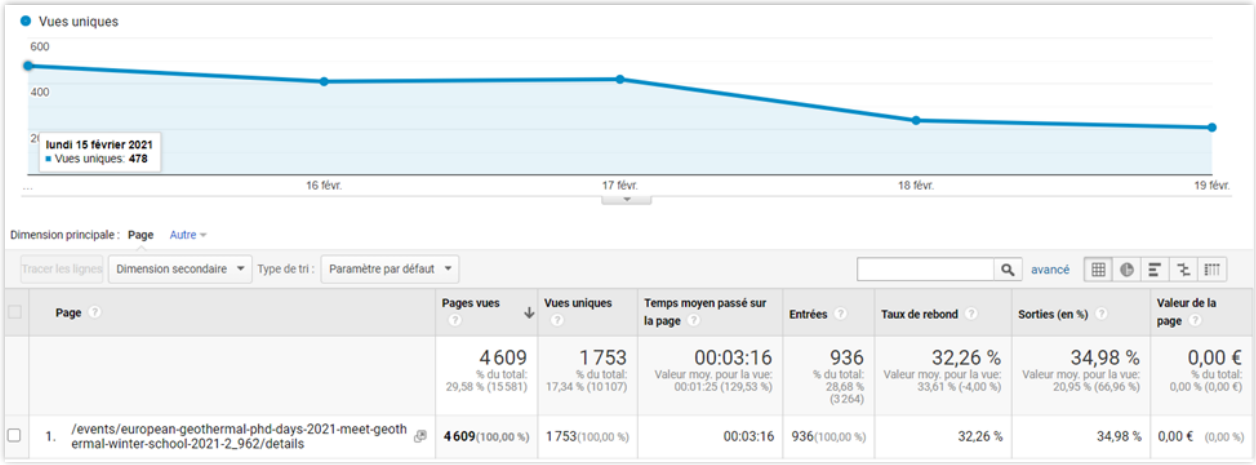


Figure 17: Statistics of PhDTalent platform during the full week.

The detail of the public webinar, the most followed content of the Geothermal Winter School, is instructive: 1387 persons were contacted for this webinar, 169 individuals registered, and 153 effective participants joined the webinar, representing a conversion rate of 11.0% of the target, with 77.5 minutes median time spent online over the 95 minutes of the webinar.

Following the instantaneous counts displayed on Zoom during the event, the number of participants for each lecture was comprised between 60 and 100. The keynote lectures were the most followed, as expected with 80 to 100 participants always connected. This is considered an honourable number for an event of this kind in the geothermal field.

Regarding the gender balance, the participants were 36% of women and 64% of men (4/7). During the public webinar, this ratio increased to 41 % of women and 59% of men (5/7).

2.3 GRATIFICATION OF PARTICIPANTS

2.3.1 Awards of the best presentations

In order to acknowledge the young researchers for the quality of their work, two prices for the best presentations were awarded to Gemma Mitjanas Colls (PhD student at the University of Barcelona) and Armand Pomart (Engineering student at UniLaSalle Beauvais). Their presentations were very pedagogical and well-presented, and gave rise to many questions in the audience. The prices were as high as 1 000 € and 500 € respectively, which was in line with the CYU budget thanks to sponsorships.

2.3.2 Certificate of participation

A certificate of participation was produced in order to reward the students who participated to the Geothermal Winter School 2021, with the number of days followed by each student. In that way, the document could serve the students who needed to validate some course credits (ECTS) in their own universities, even though this is not an accredited formation neither a proper diploma.

This certificate was co-signed by the President of CY Cergy Paris Université (CYU), François Germinet, who came at the introduction of the Geothermal Winter School to welcome the participants, and the coordinator of MEET project, Albert Genter (ES-Géothermie), who gave some conclusion words on the last day.

This certificate was sent to 155 registered participants several weeks after the event closed on the 19th February, 2021.

The preview of the certificate can be found hereafter (Figure 18).

CERGY PARIS UNIVERSITÉ

MEET Multi-sites EGS Demonstration

CERTIFICATE OF PARTICIPATION

The present document certifies that ..... participated during 3 and 1/2 days to the Geothermal Winter School 2021 organized by CY Cergy Paris Université, in the frame of the Horizon 2020 MEET project "Multidisciplinary and multi-context demonstration of EGS exploration and exploitation techniques and potentials".

February 19th, 2021

CY Cergy Paris Université
President
François Germinet

ES-Géothermie
MEET Project Coordinator
Albert Genter

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 792037

Figure 18: Certificate of participation to the Geothermal Winter School 2021.

2.4 PERSPECTIVES FOR DISSEMINATION

2.4.1 Target of young generation and general public

In terms of training and dissemination of MEET activities, the Geothermal Winter School was the achievement of Task 8.3 “Practice oriented education and training”. This event brought up-to-date knowledge on Enhanced Geothermal Systems, current applications and demonstrations of the MEET projects, as well as other geothermal sub-domains to the young generation of geothermal scientists. It allowed a fruitful time of scientific discussion between experts, between junior and senior scientists but also with non-experts through the public webinar.

This online training program succeeded to reach the young scientific community in geothermal and the European citizens, which was very challenging, especially after the outbreak of COVID-19 that disorganised a significant effort to achieve the first part of this task and after a year of strong impacts on trans-country mobility.

2.4.2 Capitalization

In order to capitalize on this event and to keep promoting the MEET project beyond its initial goals, CYU and Ayming are preparing contents based on recordings made during the geothermal week and that will be made available online on the MEET website, in the “Project results” section (https://www.meet-h2020.com/project-results/).

It will consist in videos, PDF presentations and abstracts for each lecture, demonstration site, virtual site visit, public webinar and presentation of young researchers, so that junior and senior scientists will be able to visualize again the Geothermal Winter School in its entirety for the years to come.

3 ANNEXES

The annexes below provide the detailed program of the Geothermal Winter School 2021 (ANNEX 1: Detailed program), the flyer made for the announcement of the Geothermal Winter School 2021 to the European universities and on social networks (ANNEX 2: Flyer of the Geothermal Winter School), the flyers made for the announcement of the European Geothermal PhD Days 2021 to the European universities and on social networks (ANNEX 3: Flyer for the European Geothermal PhD Days 2021 and ANNEX 4: Flyer for extended deadline of the EGPD 2021), and the invitation to the public webinar of the Geothermal Winter School 2021 sent to 1387 contacts all-over Europe (ANNEX 5: Invitation for public webinar).

ANNEX 1: DETAILED PROGRAM

16 February 2021 – in common with EGPD 2021

Demo-site session

- 13:00 – 13:30 **Thomas Kohl** (Karlsruhe Institute of Technology) – Case study from Rhine Graben / Munich area
- 13:30 – 14:00 **Hannes Hofmann** (GFZ-Potsdam) – Hydraulic soft stimulation of a geothermal well in Reykjavik (Iceland)
- 14:00 – 14:30 **John Reinecker** (Geothermal Engineering GmbH) (in replacement of **Lucy Cotton** - GeoScience Limited) – United Down Deep Geothermal Project (Cornwall, UK)
- 14:30 – 15:30 **Christian Boissavy** (G²H Conseils) – Deep geothermal energy for district heating network: case histories in Paris Basin and lessons learned since 50 years
- 15:30 – 16:00 Break

Virtual visits of geothermal sites

- 16:00 – 17:00 **Guillaume Ravier** (ES-Géothermie) – Live visit of Rittershoffen geothermal heat plant for industry
- 17:00 – 18:00 **Jean-Marc Bertrand** (ENGIE Solutions) – Presentation of Dammarie-les-Lys surface installations for district heating
- 18:00 – 19:00 **André-Charles Mintsa & Eric Léoutre** (Enogia & Vermilion Energy) – Presentation of ORC turbine units on Chaunoy oil field
- 19:00 – 19:30 Conclusion of 12th EGPD

17 February 2021

- 8:30 – 8:45 Welcome
- 8:45 – 9:30 **Fabienne Brutin** (Ayming) – Boost your researcher career with EU funds
- 9:30 – 11:00 *Introductory course / public talk*: **Iain Stewart** (University of Plymouth, Director of Sustainable Earth Institute) – Taking the Heat Out Of Geothermal: Geo-energy Communications for Publics and Policy

Thematic 1: Deep geothermal systems for heat & power in various geological settings

- 11:00 – 12:00 *Keynote lecture*: **Ernst Huenges** (GFZ-Potsdam) – Engineered Geothermal Energy Systems in Europe
- 12:00 – 13:00 Lunch Break
- 13:00 – 14:00 *Keynote lecture*: **Albert Genter** (ES-Géothermie) – Deep fractured EGS, Concepts and reservoir assessment in the Upper Rhine Graben
- 14:00 – 15:00 **John Reinecker** (Geothermal Engineering GmbH) – Exploration workflow for deep geothermal systems

- 15:00 – 16:00 **Kristian Bär** (Technische Universität Darsmstadt) – Planning reservoir stimulation, technical steps and risk mitigation
- 16:00 – 16:30 Break
- 16:30 – 20:00 **Oral session – Young European researchers in geothermal**
  - 16:30 – 17:00 Talk #1: Akos Kiss (Univ. Durham) – Safe Enhanced Geothermal System (EGS) Development of the Dinantian Carbonate play, UK
  - 17:00 – 17:30 Talk #2: Aurore Laurent (Univ. Lille) – 3D structural modelling of the Dinantian carbonates reservoir in the Nord-Pas-de-Calais coal basin area: towards a better characterization of the deep geothermal resource in Northern France
  - 17:30 – 18:00 Talk #3: Cédric Bailly (CYU) – Enhancing the exploitation of sedimentary basins for the energy transition: From hydrocarbon resources production to geothermal heat generation
  - 18:00 – 18:30 Talk #4: Ines Raies (CYU / IFPEN) – Identification and understanding of colloidal destabilization mechanisms in geothermal processes
  - 18:30 – 19:00 Talk #5: Katherine Ford (Univ. Göttingen) – A Multi-proxy Approach for Fracture Network Quantification of Regional Fold and Thrust Structures for Geothermal Reservoir Characterisation
  - 19:00 – 19:30 Talk #6: Gemma Mitjanas (Univ. Barcelona) – The Vallès Basin Geothermal system in the frame of the GEO-URBAN project
  - 19:30 – 20:00 Talk #7: Johanne Klee (UniLasalle) – Characterization of a geothermal reservoir analogue: Fractured granite of the Noble Hills Range, CA, USA

18 February 2021

- 9:00 – 10:00 **Béatrice Ledésert & Ronan Hébert** (CY Cergy Paris Université) – Fractures and hydrothermal alterations: a review of fluid pathways for geothermal applications
- 10:00 – 11:00 **Ghislain Trullenque** (UniLasalle) – Death Valley granites as analogue of EGS Soultz-sous-Forêts reservoir
- 11:00 – 12:00 **Yves Vanbrabant** (Geological Survey of Belgium) – The role of anisotropy in geothermal systems in meta-sedimentary rocks
- 12:00 – 13:00 Lunch Break
- 13:00 – 14:00 **Bernd Leiss** (Georg-August Universität Göttingen – Universitätsenergie Göttingen GmbH) – An unorthodox exploration and exploitation strategy for the development of an unconventional geothermal reservoir, the Göttingen University campus demo site

<u>Thematic 2: Increase heat production from existing geothermal plants and oil wells</u>

- 14:00 – 15:00 **Ivan Rasjl** (UNIZG-FER) – Site-specific environmental and economic assessment of EGS using Decision-Making Tool (DMT)
- 15:00 – 16:00 **Eric Léoutre** (Vermilion Energy) – Co-production of oil and geothermal heat: opportunities and challenges

- 16:00 – 16:30 Break
- 16:30 – 20:00 **Oral session – Young European researchers in geothermal**
    - 16:30 – 17:00 Talk #8: Armand Pomart (UniLasalle) – Study of an analogue to the Soultz-sous-Forêts granitic geothermal reservoir: from photogrammetric acquisition to DFN modelling and fluid flow simulation
    - 17:00 – 17:30 Talk #9: Martha Nnko (TU Delft) – Mechanical Characterization and Potential Evaluation of the Geothermal System in Songwe field, Mbeya, Tanzania
    - 17:30 – 18:00 Talk #10: Lei Wang (GFZ) – Laboratory insight into fluid-induced fault slip behavior: Implications for induced seismicity
    - 18:00 – 18:30 Talk #11: Chaojie Cheng (GFZ) – Long-term evolution of fracture permeability in slate as potential target reservoirs for Enhanced Geothermal Systems (EGS)
    - 18:30 – 19:00 Talk #12: Aysegül Turan (TU Darmstadt) – Multi-parameter Petrophysical Characterization of Variscan Granite from Cornwall-UK
    - 19:00 – 19:30 Talk #13: Maxime Catinat (UPS) – NMR contribution in sub-horizontal well for porosity-permeability heterogeneity characterization in limestones: implications for 3D reservoir prediction and flow simulation in a world class geothermal aquifer
    - 19:30 – 20:00 Talk #14: Saeed Mahmoodpour (TU Darmstadt) – Thermo-hydro-mechanical (THM) simulation of the heat extraction from geothermal reservoirs (field scale simulation of Soultz-sous-Forêts and outcrop-based simulation of Göttingen site)

19 February 2021

- 9:00 – 10:00 **Eléonore Dalmais** (ES-Géothermie) – Optimization of energy valorization on EGS plant, application to Soultz-sous-Forêts demo-site
- 10:00 – 11:00 **André-Charles Mintsa** (Enogia) – ORC technology and implementation in different geological contexts
- 11:00 – 12:00 **Vincent Lanticq** (Fébus Optics) – Fiber optics, an adaptable and cost-effective technology for monitoring geothermal reservoirs at different scales
- 12:00 – 13:00 Lunch Break

Thematic 3: Mapping best locations for future installations in Europe and promoting EGS

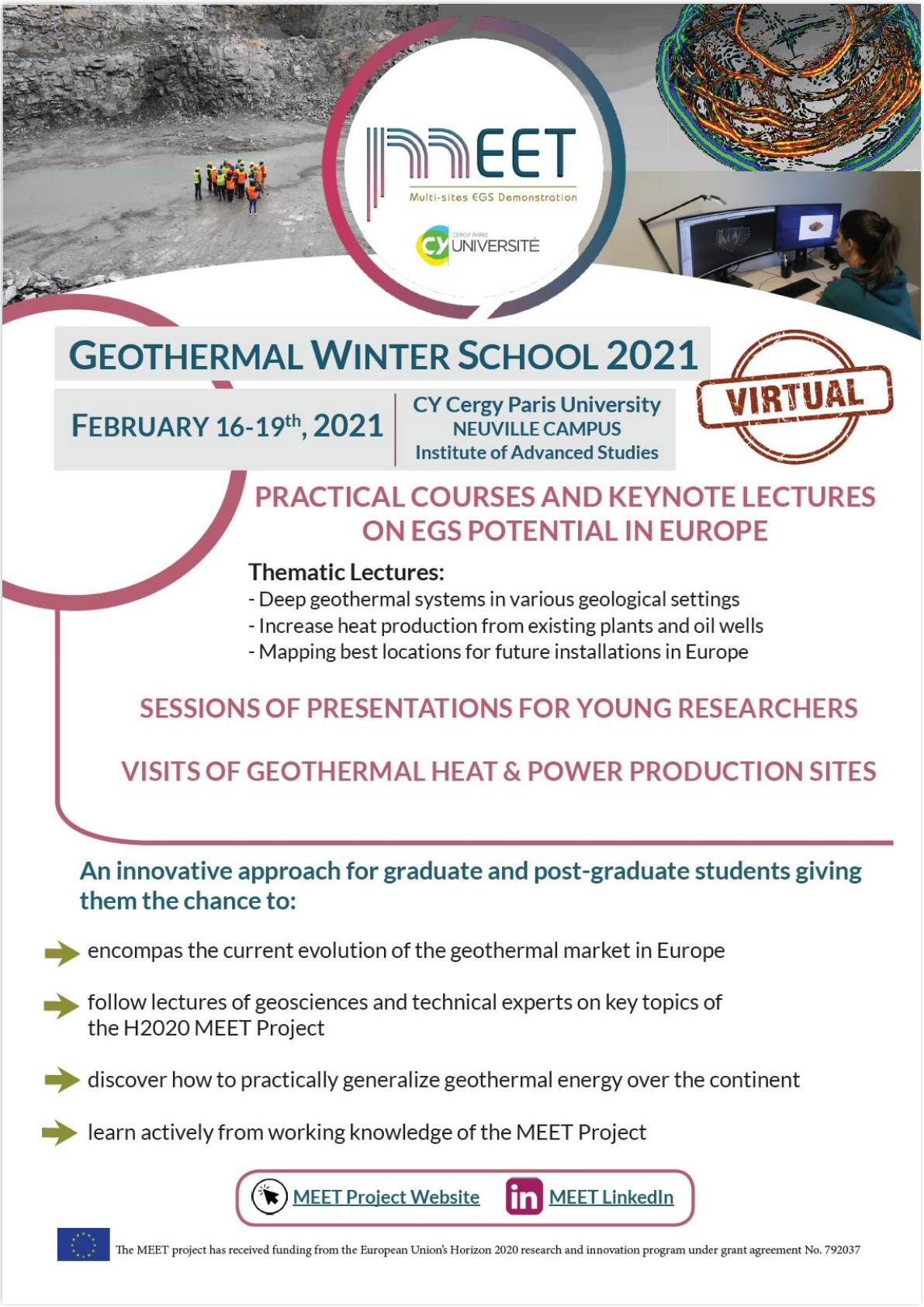
- 13:00 – 14:00 *Keynote lecture*: **Adele Manzella** (Consiglio Nazionale delle Ricerche – Istituto di Geoscienze e Georisorse) – Social aspects for geothermal energy development and policy implications
- 14:00 – 15:00 *Keynote lecture*: **David Bruhn** (GFZ – TUDelft) – Determining the key parameters and suitable measures for successful EGS developments
- 15:00 – 16:00 **Bianca Wagner** (Georg-August Universität Göttingen) – Concepts and data sources for mapping deep geothermal resources throughout Europe
- 16:00 – 16:30 Break
- 16:30 – 19:30 **Oral session – Young European researchers in geothermal**
    - 16:30 – 17:00 Talk #15: Edoardo Pezzulli (ETHZ) – A J-integral to simulate hydraulic fracturing in deep geothermal systems

- 17:00 – 17:30 Talk #16: Anvar Farkhutdinov (BSU) – A numerical modelling approach for geothermal waters sustainable use (the Khankala geothermal field case)
- 17:30 – 18:00 Talk #17: Lily Suherlina (TU Delft) – Characterizing reservoir behaviour changes in exploited high enthalpy geothermal field in Indonesia-integration well data
- 18:00 – 18:30 Talk #18: Francisco Porturas (Geothermal Association of Peru) – Oil & Gas and geothermal coproduction
- 18:30 – 19:00 Talk #19: Ana Soles Valdivia (Independent) – Open tools for gathering and integrate data for Geothermal Prospect evaluation
- 19:00 – 19:30 Talk #20: Philipp Schröer (Univ. Ruhr-Bochum) – Development of a novel Percussion Mechanism for Downhole Hammer Drilling

- 19:30 – 20:00 Conclusion of Geothermal Winter School

The whole planning is given in CET (UTC+1)

ANNEX 2: FLYER OF THE GEOTHERMAL WINTER SCHOOL



ANNEX 3: FLYER FOR THE EUROPEAN GEOTHERMAL PHD DAYS 2021

CERGY PARIS UNIVERSITÉ

UNIVERSITÉ DE NEUCHÂTEL

EGPD 2021

12th edition

February 15-16th

2021

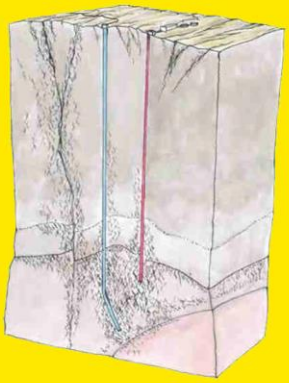
SAVE THE DATE

VIRTUAL

Geothermics in a critically stressed crust

1. Reservoir geomechanics / reservoir management
2. Earthquake mechanics
3. Faults characteristics and properties
4. Modelling of geothermal processes

Applied geothermal case studies and site visits



20 selected abstracts per session

FREE REGISTRATION online

Abstract submission deadline: November 30th

Registration close: December 31st

For more information, please visit: https://web.u-cergy.fr/egpd2021/
or contact us: egpd2021@ml.u-cergy.fr

ANNEX 4: FLYER FOR EXTENDED DEADLINE OF THE EGPD 2021

CERGY PARIS UNIVERSITÉ

UNIVERSITÉ DE NEUCHÂTEL

EGPD 2021

12th edition

February 15-16th

2021

European Geothermal PhD Days 2021

SAVE THE DATE

VIRTUAL

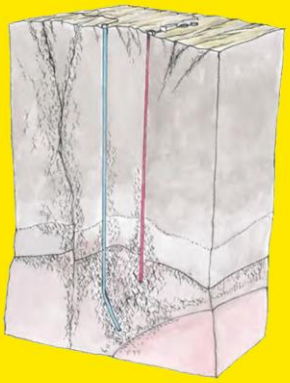
Geothermics in a critically stressed crust

4 poster sessions (prices for best posters)

1. Reservoir geomechanics / reservoir management
2. Earthquake mechanics
3. Faults characteristics and properties
4. Modelling of geothermal processes

The above sessions correspond to the main topics but all topics in geothermal energy can be represented

+ Demo-sites and geothermal case studies



20 selected abstracts per session
other topics welcomed

FREE REGISTRATION
online

Abstract submission deadline:
extended to December 31st

Registration close:
December 31st

For more information, please visit: https://web.u-cergy.fr/egpd2021/
or contact us: egpd2021@ml.u-cergy.fr

ANNEX 5: INVITATION FOR PUBLIC WEBINAR

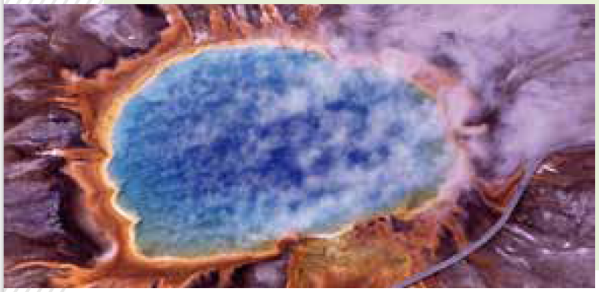
Taking the heat out of Geothermal - Geo-energy communication for Publics and Policy

Geothermal renewable energy

Wednesday 17th February 2021, 9h30 am (CET / GMT+1)

Public talk
Introductory lecture of the Geothermal Winter School 2021,
in the framework of H2020 EU-project MEET

Join Webinaire



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