

Autumn School of the Geothermal-Alliance Bavaria

11th - 12th November 2024
University of Stavanger, Norway

Future Energy Technologies: Deep Geothermal Energy, CCS and Hydrogen Storage

in association with the

European Geothermal Workshop 2024

About the Autumn School:

The Autumn School is an exceptional opportunity for doctoral students and interested candidates in the fields of geoscience and engineering to deepen their understanding in Future Energy Technologies such as deep geothermal energy, carbon capture and storage (CCS) and hydrogen storage. This intensive program features four sessions with presentations on recent topics and interactive discussions to ensure a dynamic learning experience. At the end of the first day, participants will engage in hands-on exercises and discuss key insights in a concise wrap-up session. To maximize engagement in our workshops, attendees are required to bring a laptop. The event also includes a social gathering to foster networking and community building.

Organized by the Geothermal Alliance Bavaria and co-funded by the Bavarian State Ministry of Science and Arts, the Autumn School is strategically scheduled as an Associated Event to the European Geothermal Workshop 2024 (EGW), which will be held at the University of Stavanger starting on 13th of November. Participants are

highly encouraged to attend both events to fully benefit from this comprehensive educational and professional development experience.

Why focus on Future Energy Technologies?

The focus on Future Energy Technologies is crucial for equipping doctoral students and professionals with the knowledge and skills needed to address the pressing energy challenges of today and tomorrow. As the demand for sustainable and clean energy sources grows, understanding and advancing technologies such as deep geothermal energy, carbon capture and storage (CCS) and hydrogen storage becomes increasingly important.

- **Deep Geothermal Energy** offers a reliable and continuous source of renewable energy, using the Earth's heat to provide heat supply, cooling and power generation. This technology is particularly promising in regions like the Bavarian Molasse Basin, the Upper Rhine Graben or Paris Basin, which have become international hotspots for geothermal research and industry. By exploring Enhanced Geothermal Systems (EGS) and deep hydrothermal aquifer systems, participants will gain insights into the latest advancements and practical implementations in this field.
- **Carbon Capture and Storage (CCS)** is a critical technology for mitigating climate change by capturing carbon dioxide emissions from industrial sources and safely storing them underground. This process can significantly reduce greenhouse gas emissions, making it an essential component of global efforts to achieve net zero emissions. Participants will learn about the latest developments, challenges, and opportunities in CCS, preparing them to contribute to this important area of research and development.
- **Hydrogen storage** is emerging as a key technology for the transition to a low-carbon energy system. Hydrogen can be produced from various sources and used for a wide range of applications, including as a fuel for transportation, for industrial processes, and as a means of storing and balancing intermittent renewable energy. Under-



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standing the methods and technologies for efficient hydrogen storage is crucial for its widespread adoption and integration into the energy mix.

About the Geothermal-Alliance Bavaria:

The Geothermal Alliance Bavaria (GAB) is a pioneering initiative funded by the Bavarian State Ministry for Science and Arts, dedicated to push research in the field of geothermal energy with the ultimate goal of strengthening the use of deep geothermal energy as a domestic energy source. The interdisciplinary project is following a holistic approach by connecting subsurface research with research on plant and energy system engineering. Coordinated by the Munich Institute of Integrated Materials, Energy and Process Engineering, the alliance brings together the expertise of five leading Bavarian universities: The Technical University of Munich, Friedrich Alexander University Erlangen-Nuremberg, University of Bayreuth, Ludwig-Maximilians University Munich (LMU) and Hochschule München – University of applied sciences (HM).

Application:

Interested candidates are encouraged to send their CV and Letter of Motivation until **15th of September 2024** to

Dr.-Ing. Fabian Uth
Technical University of Munich
Munich Institute of Integrated Materials, Energy and Process Engineering (MEP)
Geothermal-Alliance Bavaria
Lichtenbergstr. 4a
85748 Garching
Mail: Fabian.uth@tum.de

A maximum of 30 participants will be admitted to the Autumn School.

Participation fees:

The participation in the GAB Autumn School is free of charge. Candidates will be admitted to the European Geothermal Workshop with no additional charges. Transportation and accommodation must be covered by the participants.

GAB Autumn School 2024 Stavanger Norway, 11th - 12th November

Monday, 11th November 2024

Session 1

8:30 – 9:00 **Registration and Welcome Coffee**

9:00 – 9:15 **Opening of the Autumn School**

Nora Medgyesi
Geothermal Alliance Bavaria
TU Munich

Prof. Mohsen Assadi
University of Stavanger

9:15 – 10:45 **Future Energy Technologies: An Overview** - Introduction to the key themes of the Autumn School

Dr. Fabian Uth
Geothermal Alliance Bavaria
TU Munich

10:50 – 12:20 **Large-Scale Utilization and Modeling for Interaction Prevention in a Sedimentary Aquifer for Geothermal Applications –**

Dr. Kai Zosseder
TU Munich

[Lunch Break](#)

Session 2

13:20 – 14:50 **Seismic monitoring methods and risk analysis** – Overview of seismic monitoring techniques and their application in ensuring the safety of geothermal energy, CCS and Hydrogen storage

Dr. Emmanuel Gaucher
Karlsruhe Institute of Technology

15:00 – 16:30 **Assessment and optimization of geologic CO₂ storage and combined Geothermal Energy Extraction**–Potential of the combined geologic CO₂ Storage with geothermal energy extraction

Prof. Martin Saar
ETH Zürich

16:40 – 18:00 **Exercises / Wrap-Up Session**
22:00 - 22:00 **Social Event**

Tuesday, 12th November 2024

Session 3

9:00 – 9:10 **Welcome**

9:10 – 10:40 **Piloting Underground Storage of Heat in Geothermal Reservoirs** – Latest advancements in underground heat storage within geothermal reservoirs
(TBA)

TU Delft

10:45 – 12:15 **Underground hydrogen storage: Technologies and Challenges** – Examination of the current technologies for hydrogen storage, their applications and operational insights

Prof. Raouf Gholami
University of Stavanger

[Lunch Break](#)

Session 4

13:10 – 14:30 **Advancements in Enhanced Geothermal Systems (EGS):** Detailed exploration of the latest technological developments and research in EGS

Anastasia Sidorova
TU Munich

[Lunch Break](#)

14:40 – 16:00 **Insights from the first commercial CO₂ project on the Norwegian Continental Shelf**

Einar Ebeltoft
Equinor

[Coffee Break](#)

16:10 – 17:30 **Exercises / Wrap-Up Session**

19:00 – 22:00 **Speaker-Dinner**

----- End of Autumn School -----

Wednesday, 13th November 2024

Start of the European Geothermal Workshop (EGW)

Associated event

**European Geothermal
Workshop 2024
(EGW)**

13th - 14th November 2024

[Link tba](#)