EXPLORING THE
DEPTHS

Geothermal Geochemistry Course

JOGMEC

GNS SCIENCE
TE PŪ AO

18 - 21 NOVEMBER
TAUPO, NEW ZEALAND

This 4-day Geothermal Course is co-led by JOGMEC and GNS Science

Taupō, New Zealand
18th – 21st November 2023

GNS SCIENCE
TE PŪ AO

JOGMEC

GNS Science is proud to deliver a new geothermal educational programme with JOGMEC

Taking place in Taupō, New Zealand, this 4-day course is a uniquely located opportunity to study the chemical composition and behaviour of waters and gases associated with geothermal systems.

The course will cover a range of geothermal geochemistry topics including,

– the sampling and analysis of geothermal waters and gases,
– interpretation of geochemical data,
– understanding the chemical processes occurring in geothermal reservoirs, and their implications for geothermal energy exploration and production.

Designed for scientists, researchers, and energy industry professionals.

Participants will enhance their understanding of the geochemical aspects of geothermal systems.

The course aims to enable participants to make informed decisions and contribute to the efficient and sustainable utilisation of geothermal resources.

The course will actively foster discussions and networking among participants to create a collaborative learning environment.

See course information online at:
https://www.gns.cri.nz/news/exploring-the-depths-course/

Programme (SUBJECT TO CHANGE)

DAY **1**

Introduction to geochemistry in geothermal exploration

Participants will learn from GNS specialists about the application of geochemical tools to the investigation and characterisation of geothermal systems.

Enthalpy calculations, geothermometry and isotope techniques will be covered as well as an introductory overview of geothermal development in New Zealand.

DAY **2**

Application of geochemistry during geothermal production

This day will focus on the use of geochemical techniques during power station and reservoir management. This includes coverage of scaling and corrosion management, as well as water-rock interaction processes in the reservoir.

We will also give an overview of the world-leading water-rock interaction experimental apparatus used at GNS and cover some of the applications of these experiments, including for reservoir CO_2 reinjection.

DAY **3**

Geochemical sampling, data analysis and geothermal power station tour

This day we will spend the morning covering geochemical sampling and data analysis, and work through example datasets in order to apply the techniques learnt in the first 2 days.

In the afternoon, we will visit a New Zealand geothermal power station for a site tour.

DAY **4**

Implementation of geochemistry in reservoir modelling and Kuirau Park site visit

On the final day participants will learn about the implementation of geochemistry into the reservoir modelling tools that underpin geothermal development.

In the afternoon, we will visit Rotorua for a tour of the spectacular natural features at Kuirau Park, where we will learn about the history of geothermal resource use in Rotorua, and the geochemistry of natural systems in relation to geothermal resources.

Registration Information

Registration

Register here: https://www.gns.cri.nz/about-us/jogmec

- Limited number of spaces available (13 - 20 participants)
- Registration closes on the 31st August 2023
- A follow-up email from GNS Science will direct participants to a private billing form which will confirm your placement on the course.

Course Costs

NZ$ 7,750 per person

Includes the course fee, shuttle bus from/to Auckland city, site visits, lunch and coffee breaks during the course, and Monday night dinner.

Not included: accommodation, breakfast, dinner, international flights, travel insurance or specific medical costs.

New Zealand Geothermal Workshop

Participants are encouraged to attend the New Zealand Geothermal Workshop (NZGW) from 15 - 17th November 2023 in Auckland.

Upon completion of the workshop a shuttle bus will be arranged to meet the course participants at the NZGW venue to travel together to Taupō.

Travel Information

Flight Recommendations

Flight to New Zealand | Narita – Auckland

Flight Number: NZ090 – Air New Zealand
Departing: Thursday 16 November at 18:30
Arrival: Friday 17 November at 09:05 (NZST)

Please note this flight does not enable participants to attend the New Zealand Geothermal Workshop which runs prior to this course from 15-17th November 2023.

Flight to Japan | Auckland – Narita

Flight Number: NZ099 – Air New Zealand
Departing: Wednesday 22 November 09:55
Arrival: Wednesday 22 November at 16:50 (Japan Time)

International flights are not included in the course costs and are booked at the discretion of the participants.

For more information go to www.airnewzealand.co.nz

Accommodation

Participants are responsible for their own accommodation in Taupō. Accommodation is not included in this cost.

The organisers have arranged the following two accommodation options.

1. Suncourt Hotel, 14 Northcroft Street, Taupō, New Zealand

reception@suncourt.co.nz / +64 7 378 8265
https://suncourt.nz
Suncourt Hotel is the course venue.

2. Beechtree Motel, 56 Rifle Range Road, Taupō New Zealand

stay@beechtreemotel.co.nz / +64 7 377 0181
https://beechtreemotel.co.nz/
This venue is only a few minutes walk from the course venue.

Travel Information

Arrival and Transport

On Friday 17 November at 3pm please meet at,

The Faculty of Engineering at the University of Auckland, 20 Symonds Street, Auckland 1010
to catch a long-distance bus from Auckland to Taupō at the following location

On the morning of Saturday 18 November please meet at,

Suncourt Hotel, 14 Northcroft Street in Taupō

On Tuesday 21 November at 5pm after the course,

After the visit to Kuirau Park, Rotorua, participants will be transported to Auckland airport via shuttle bus. Participants are responsible for making their own accommodation arrangements for the evening of Tuesday, 21st November. There are hotel options available near the airport and in Auckland city. Please note that the Auckland to Narita flight has a scheduled departure for 09:30 on Wednesday 22nd November. Refer to the Flight Recommendations section for more details.

Presenters

Bruce Mountain

Lead Scientist - Experimental Geochemistry Lab (Wairakei)

Bruce has over 20 years of experience working in geothermal geochemistry for GNS. As the founder and current leader of the Experimental Geochemistry Lab, he conducts bespoke high pressure and temperature water-rock interaction experiments for both industry clients and academic purposes. He has over 40 publications in the areas of geothermal and hydrothermal chemistry, mineralisation and geomicrobiology research.

James Patterson

Geothermal Reservoir Modeller

James is a specialist in the use of reservoir modelling to investigate the behaviour of geothermal reservoirs, using a variety of industry standard software packages. His background in academic research focused on the use of computational techniques to model thermo-hydro-mechanical controls on natural convection in faults and fractures, and he is currently working at GNS on a variety of projects, including the incorporation of geochemical constraints into reservoir models. James will be leading the part of the course focused on computational techniques in geothermal geochemistry.

Brad Scott

Volcano Information Specialist

Brad is a volcanologist with over 45 years experience monitoring geothermal systems and volcanoes in NZ. He has been part of the team working on the recovery of the Rotorua Geothermal System and monitoring of the Waimangu system. Brad will lead the field trip to look at the variety of surface features seen in Rotorua City.

David Byrne

Hydrothermal Geochemist

David is a gas geochemist, specialising in the use of noble gas isotopes to investigate subsurface fluid systems. He completed his PhD at the University of Oxford before working as a PostDoc in Nancy, France, before joining GNS in July 2022. David's academic contributions include publications on the Icelandic and Yellowstone geothermal systems. At GNS, he is working on understanding the fate of CO_2 in geothermal systems.