

<b>Ph.D. Position</b>	Coupled Thermo-Hydro-Chemical model of geothermal wells
<b>Job description</b>	<p>The objective of this PhD project is to apply and to further develop a well simulator. This tool enables to simulate transient mass flow, pressure, temperature, and profile of equilibrium chemical species concentration in geothermal wells. These parameters enter into a variety of geothermal production-operation calculations including well drilling and completion, stimulation, mineral scaling and analyses of pressure-transient test data. Simulations can replace real measurements when the latter are unavailable at the depth of interest or during the period of interest, as typically seen in deep geothermal wells. They can also be used to predict well behaviour.</p> <p>The current simulation code is based on the two open sources codes Elmer (for thermal-hydraulic and advection-diffusion transport) and phreeqC (for chemistry). It is developed in the frame of an open source integration platform written in Python. Especially at the beginning of the work, scientists will provide support to learn about the existing tool and its use. In the course of the project, the interfacing with the PHREEQC 3 code should be validated, and the code should be upgraded to comply with the Elmer 7 code and to include two-phase flow modelling (liquid-like, gas-like). In cooperation with the European Institute for Energy Research, the PhD work will be done in the frame of an EU project that focuses on the deployment of deep geothermal systems, see <a href="http://deepegs.eu">http://deepegs.eu</a>. It offers the unique opportunity to apply and develop the well simulator on data sets acquired at exceptional geothermal sites (e.g. Iceland – saline, super-critical fluids). Moreover, it offers to work in cooperation with an international team of scientists, hence to develop a scientific network and to communicate the results at a large scale. Throughout the project, there will be multiple opportunities for communicating about the project results in the form of presentations at conferences and publications in high-impact journals.</p> <p><i>Keywords:</i> geothermal energy, fluid mechanics, thermo-hydro-chemical processes, scientific computing</p>
<b>Qualification</b>	<p>The ideal candidate should hold an M.Sc. in Physics, Fluid mechanics, or in Applied Mathematics.</p> <p>Experience in scientific computing and programming is required.</p> <p>Persons with curiosity for science and with good communication skills are expected. KIT is an equal opportunity employer. Women are especially encouraged to apply. If equally qualified, handicapped applicants will be preferred.</p>
<b>Salary</b>	Based upon the salary frame agreement for the Public Service sector (TV-L E13, 75%)
<b>Institute/ Department</b>	Karlsruhe Institute of Technology, Institute of Applied Geosciences, Division of Geothermal Research, in cooperation with the European Institute for Energy Research (EIFER)
<b>Contract duration</b>	3 years
<b>Starting date</b>	As soon as possible
<b>Application until</b>	15.02.2017
<b>Contact person for technical issues</b>	<p>Dr. Alain Dimier, European Institute for Energy Research (EIFER), email: <a href="mailto:alain.dimier@eifer.org">alain.dimier@eifer.org</a>, phone: +49 721 6105 1493</p> <p>or</p> <p>Dr. Emmanuel Gaucher, KIT-AGW-Geothermie, email: <a href="mailto:emmanuel.gaucher@kit.edu">emmanuel.gaucher@kit.edu</a>, phone: +49 721 608 45223</p>
<b>Application</b>	Please send your application via email using the reference “PhD DEEPEGS” directly to the technical contact person(s).