

ENIGMA Innovative Training Network: 15 PhD positions

European training Network for **in situ imaging** of **dynamic** processes in heterogeneous subsurface environments

ENIGMA is an Initial Training Network (ITN) funded by the European Commission. The ENIGMA ITN aims at training a new generation of young researchers **in the development of innovative methods for imaging process dynamics in subsurface hydrosystems**, in order to enhance understanding and predictive modelling capacities and to transfer these innovations to the economic sector.

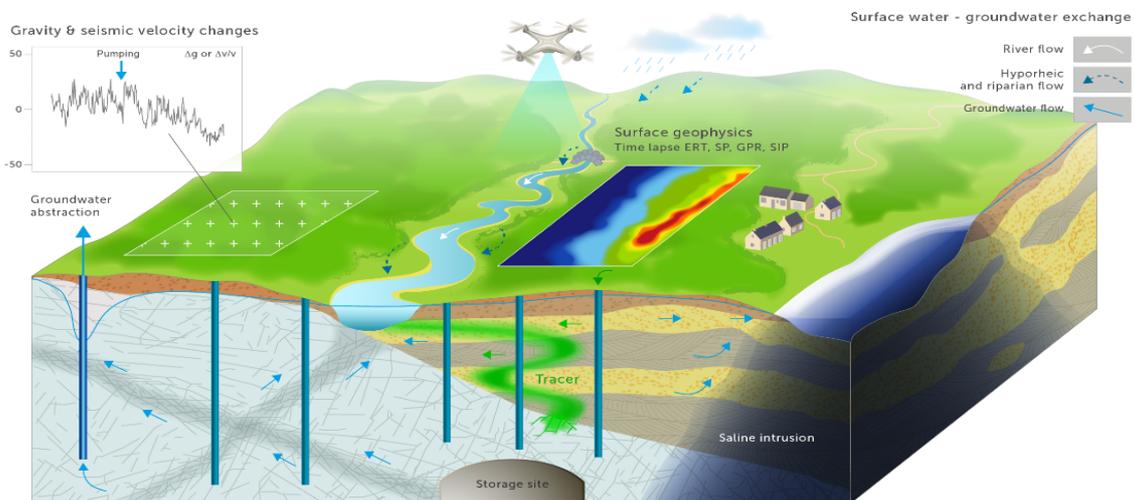
The 15 young future PhD students will contribute to develop the spatial representation of subsurface heterogeneity, fluxes, chemical reactions and microbial activity, through the **integration of data** and approaches from **geophysics, hydrology, soil physics, and biochemistry**.

The ENIGMA network gathers 21 partners (14 academic and 7 industrial) from 8 European countries.

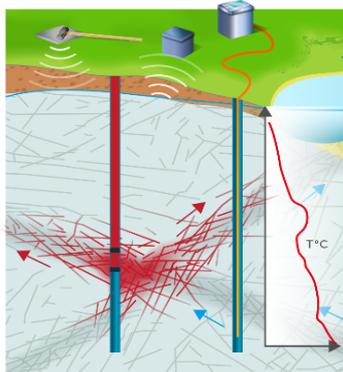
Each of the **15** future PhD students will conduct the research work in 2 or 3 institutions, in collaboration with industrial partners. ENIGMA will start in January 2017.

Website: <https://enigma-itn.eu/>

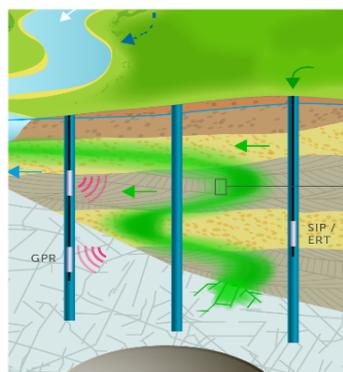
We are now recruiting students with a Master degree for three-year PhD positions (starting before July 2017). Applicants should apply through the website with a motivation letter for up to 3 PhD topics from the list below (see website for further details), a CV with relevant documentation, and names of at least two referees.



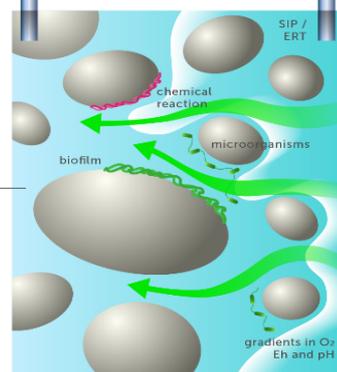
Quantification of the temporal dynamics and spatial distribution of fluxes and water content



Process based imaging for transport of dissolved elements



Geophysical signature of mixing, reactivity and biofilms



PhD POSITIONS AVAILABLE:

ESR1-PhD: Mixing and chemical reaction hotspots in saline-freshwater mixing zones

Supervisor: Marco Dentz, Jesus Carrera, **CSIC Barcelona** (CNRS Rennes, UNIL Lausanne, ACA Barcelona)¹

ESR2-PhD: Imaging flow dynamics and reactivity in the stream-aquifer transition zone

Supervisor: Jan Fleckenstein, **UFZ Leipzig** (UCPH Copenhagen, UNINE Neuchâtel)¹

ESR3-PhD: Closing the observational gap between the hyporheic and meander scale

Supervisor: Philip Brunner, **UNINE Neuchâtel** (UFZ Leipzig, GEOTH Heiligenstadt)¹

ESR4-PhD: Flow and transport in fracture networks: reducing uncertainty of DFN models by conditioning to geology and geophysical data

Supervisor: Caroline Darcel, **ITASCA**, Philippe Davy, **CNRS Rennes**, (UNIL Lausanne, SKB Sweden)¹

ESR5-PhD: Monitoring spatio-temporal water redistribution in the subsurface with seismic methods

Supervisor: Laurent Longuevergne, **CNRS Rennes**, Ludovic Bodet, **UPMC Paris** (UNIL Lausanne, SKB Sweden)¹

ESR6-PhD: Active Fiber-Optic DTS methods to monitor subsurface flow dynamics

Supervisor: Olivier Bour, **CNRS Rennes** (CSIC Barcelona, OSU Oregon, SILIXA)¹

ESR7-PhD: Multi-scale thermal imaging of groundwater upwelling in stream valleys

Supervisor: Peter Engesgaard, **UCPH Copenhagen** (UNINE Neuchâtel, UFZ Leipzig)¹

ESR8-PhD: Monitoring water storage changes with a new portable absolute quantum gravimeter

Supervisor: Bruno Desruelle, **μQuaS**, Cédric Champollion, **UM Montpellier** (UCPH Copenhagen)¹

ESR9-PhD: Geophysical signatures of spreading and mixing

Supervisor: Niklas Linde, **UNIL Lausanne** (CNRS Rennes, CSIC Barcelona)¹

ESR10-PhD: High resolution imaging of transport processes with GPR full-waveform inversion

Supervisor: Jan van der Kruk, **FZ Jülich** (CNRS Rennes, UNIL Lausanne)¹

ESR11-PhD: Joint heat and solute tracer test inversion for imaging preferential pathways

Supervisor: Alain Dassargues, **ULG Liège** (BRGM Orléans, FZ Jülich)¹

ESR12-PhD: Spectral induced polarization monitoring to quantify biochemical reactions

Supervisor: Sander Huisman, **FZ Jülich** (CNRS Rennes)¹

ESR13-PhD: Fully coupled hydrogeophysical inversion of 3D tracer tomography

Supervisor: Olaf A. Cirpka, **UT Tübingen** (ULG Liège)¹

ESR14-PhD: Geologically constrained joint inversion of hydraulic, tracer and ERT data for process visualization

Supervisor: Jesus Carrera, **CSIC Barcelona** (UCPH Copenhagen, ACA Barcelona)¹

ESR15-PhD: Integration of dynamical hydrogeophysical data in a multiple-point geostatistical framework.

Supervisor: Frédéric Nguyen, **ULG Liège** (CSIC Barcelona, AQUA Montpellier)¹

¹ Candidates will devote time to learn methods and/or do field work at co-supervising centers, in parenthesis.