ENIGMA Innovative Training Network

4th school on *Flow and Transport in Porous and Fractured Media, Development, Protection, Management and Sequestration of Subsurface Fluids*

Summer School

June 25 to July 6, 2018
Corsica, France

MARIE CURIE ACTIONS

ITN Enigma

CRITEX

Terre, Écosystèmes et Sociétés

Observatoire des Sciences de l'Univers de Rennes

INSTITUT D'ÉTUDES SCIENTIFIQUES DE CARGÈSE

cnrs dépasser les frontières

When ?

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Workshops Schedule

- 2017 9-20 october Liege/Ploemeur (Advanced subsurface imaging « field oriented » with training on database), with Network meeting in between
- 2018 7-16 February Lausanne/Neufchatel (Advanced inverse modeling and stochastic representation of complex media, Predictive modelling and upscaling) with break event (TBD) (UT, CSIC, UNINE, UNIL)
- 2018 25 June- 6 July Summer school Corsica (Sensing and modelling of flow and transport processes) by CNRS
- 2019 Barcelona lifestime skill and midterm review of the ESR
- 2019 July Groundwater Quality with special session
- 2020 Final conference Copenhagen

June 25 to July 6, 2018

NETWORK wide events adjacent to the workshops

Already soon…

Where ?

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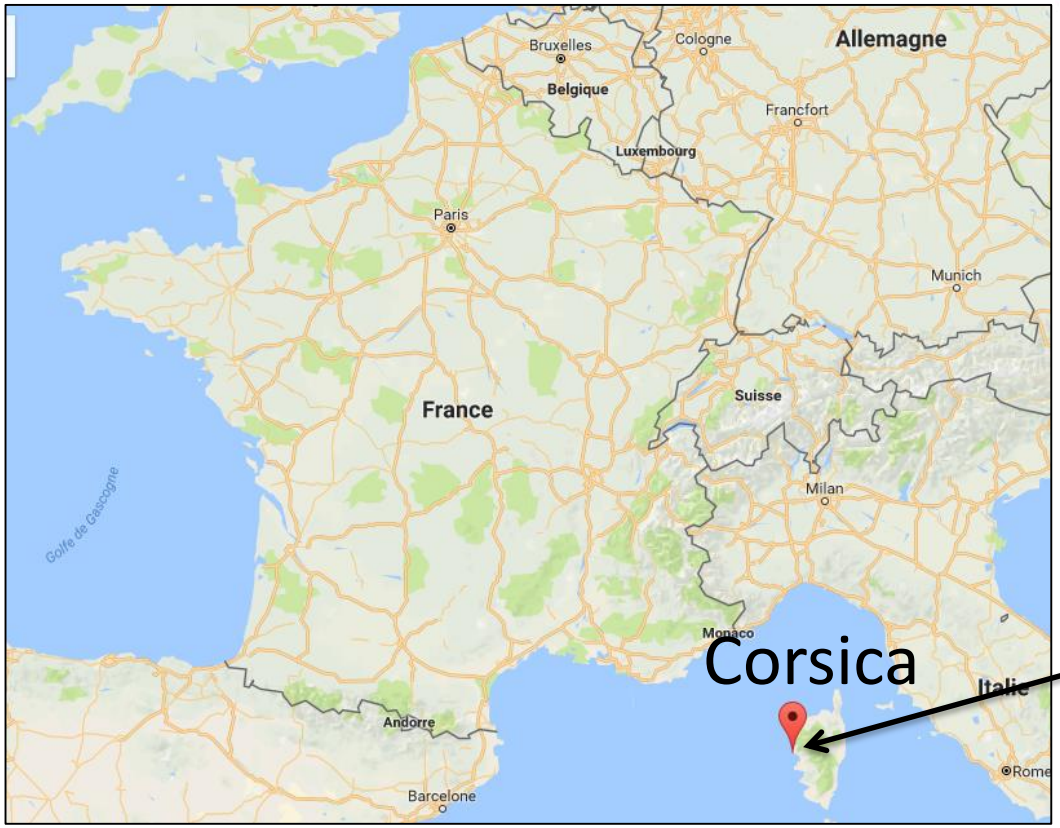

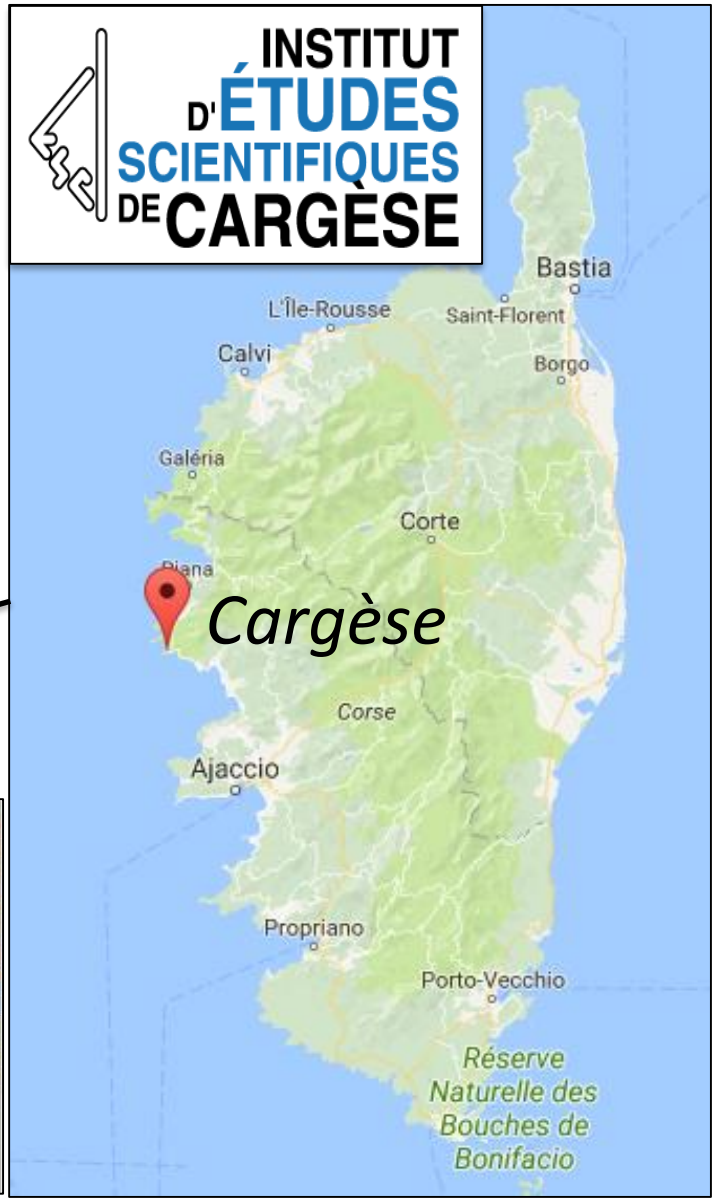

Who ?

You !

…and ~80 others

<u>General idea (max capacity 105):</u>

- ~60 PhD
- ~10 Post-Docs
- ~10 young researchers (<10 years experience)
- ~20 confirmed researchers (>10 years experience)
- ~5 industrial partners

What ?

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General objective (SPIC): Study **S**ubsurface **P**rocesses **I**n the **C**ritical zone by observation, experimentation, and modelling

Learning objectives (1 per day):

- Flow in Saturated Media
- Unsaturated and multiphase flow
- Geophysics
- Transport Phenomena
- Geochemistry and reactive transport
- Large scale Hydrology
- Modelling
- Energy transport and storage
- Hydromechanics
- Microbiology and Ecohydrology

→ **trans-disciplinary approach to understand the CZ !**

Scientific program

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From Tuesday June 26…

		Tuesday	Wednesday	Thursday	Friday	Saturday
Time	Mode (presentation+questions)	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun
09:00 - 10:00	Lecture 1 (1h)	Introduction and presentation of the summer school - **Organizing committee chairs**	Soil physics 1 **R. van Genuchten**	Geophysical methods (Electrical, EM, Potential fields) **N. Linde**	Transport Phenomena **M. Dentz**	Geochemistry and reactive transport **J. Gaillardet**
10:00 - 10:30	Coffee break					
10:30 - 12:30	Workshop - Practical courses	How to do innovative science - **J.Selker** Flow in Saturated Media - **J. Carrera**	Workshop - Practical courses	Workshop - Practical courses	Workshop - Practical courses	Workshop - Practical courses
12:30 - 14:00	Lunch break					
14:00 - 15:00	Lecture 2 (1h)	Flow in Saturated Media - **M. Quintard**	Soil physics 2 **D. Or**	Inversion methods - Stochastic approach **N. Linde**	Transport Phenomena **T. Le Borgne**	Geochemistry and reactive transport **O. Cirpka**
15:00 - 15:30	Coffee break					
15:30 - 16:15	Research Seminar 1 (35 min + 10 min)	Microfluidics **P. Tabeling**	Multiphase flow at Darcy scale **I. Neuweiler**	Hydrogeophysical imaging (including critical zone) **K. Singha**	Mixing in porous media **E. Villermaux**	Critical zone geochemistry **J. Gaillardet**
16:15 - 17:00	Research Seminar 1 (35 min + 10 min)	Complex fluids (non newtonian) **M. Quintard**	Multiphase flow at pore scale and microCT imaging **M. Blunt**	Processed-based hydrogeophysics and biogeophysics **A. Binley**	Saline intrusion **(to be defined)**	Reactive transport **O. Cirpka**
17:00 - 17:15	Break					
17:15 - 18:00	Research Seminar 1 (35 min + 10 min)	**Round tables/discussion**	Multiphase flow at pore scale in microfluidics **Jimenez-Martinez**	Inversion methods - Determinitistic approach **F. Nguyen**	Foam flow in porous media **Y. Méheust**	CO2 storage **A. Niemi**
18:00-18:45	Poster session	**PICO + Poster**	**PICO + Poster**	**PICO + Poster**	**PICO + Poster**	**PICO + Poster**

Scientific program

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… to Friday July 6.

Sunday July 1

free day

Monday	Tuesday	Wednesday	Thursday	Friday
2-Jul	3-Jul	4-Jul	5-Jul	6-Jul
Microbiology and Ecohydrology **P. Van Cappellen**	Large scale Hydrology **(to be defined)**	Modelling **J-R De Dreuzy**	Energy transport and storage **M. Blunt**	Hydromechanics **M. Manga**
Workshop - Practical courses	**Workshop - Practical courses**	**Workshop - Practical courses**	**Workshop - Practical courses**	**Workshop - Practical courses**
Soil microbiology **D. Or & R. Tecon**	Catchment scale processes - catchment as reactors **J. Druhan**	Modelling **C. Soulaine**	Geothermal energy **P. Bayer**	Fracture mechanics **C. Darcel & P. Davy**
Subsurface microbiology and link with biogeochemical cycles **P. Van Cappellen**	Large scale hydrology and climate change **L. Longuevergne**	Conceptual models for groundwater systems **J. Carrera**	Underground nuclear waste storage **J-O. Selroos**	Earthquake-triggered hydrological impacts **M. Manga**
Bacteria & biofilm in microfluidics **P. de Anna**	Remote sensing **B. Scanlon**	Model and decision making in hydrology **T. Ferré**	Shale gas - risk assesment on groundwater **B. Parker**	Thermo-Hydro-Mechanical processes in fractured reservoirs **A. Pio Rinaldi**
Contaminant transport and bioremediation **B. Parker**	SW/GW interaction - Hyporheic zone processes and hydroecology **J. Fleckenstein**	Stochastic models **J. Caers**	**Round tables/discussion**	Fracture networks **P. Davy**
PICO + Poster	**PICO + Poster**	**PICO + Poster**	**PICO + Poster**	**PICO + Poster**

Scientific program

ITN Enigma

… to Friday July 6.

Experimental projects (under construction)

Field hydrogeophysics	
	ERT - PS - EM - GPR
	Fiber optic
Lab projects	
	Transparent 3D porous media (Columns experiments)
	Micromodels and microbiology
Numerical projects	
	OPEN FOAM
	CRUNCH FLOW

ESR implication

ESR could be a link between students and lecturers:

- Animation of the scientific discussion (after talks)
- Chair/organize the PICO session (“2min madness” to advertise the poster)
- Propose/choose topic and organize round tables (1, 2 or 3 ?)
- Propose experiments (maybe help punctually)

ENIGMA Meeting @Cargèse

Required meetings:

- Advisory board meeting (~2h)
- Supervisory board meeting (~1h)
- Experimental and infrastructure board meeting (~1h)

Given the busy schedule, only spot left is Saturday June 30 after 18:00 (in parallel to the Poster session)

ESR student should have met the members of the advisory board before (presentation of PhD thesis, results, …) for a more informed discussion

Application

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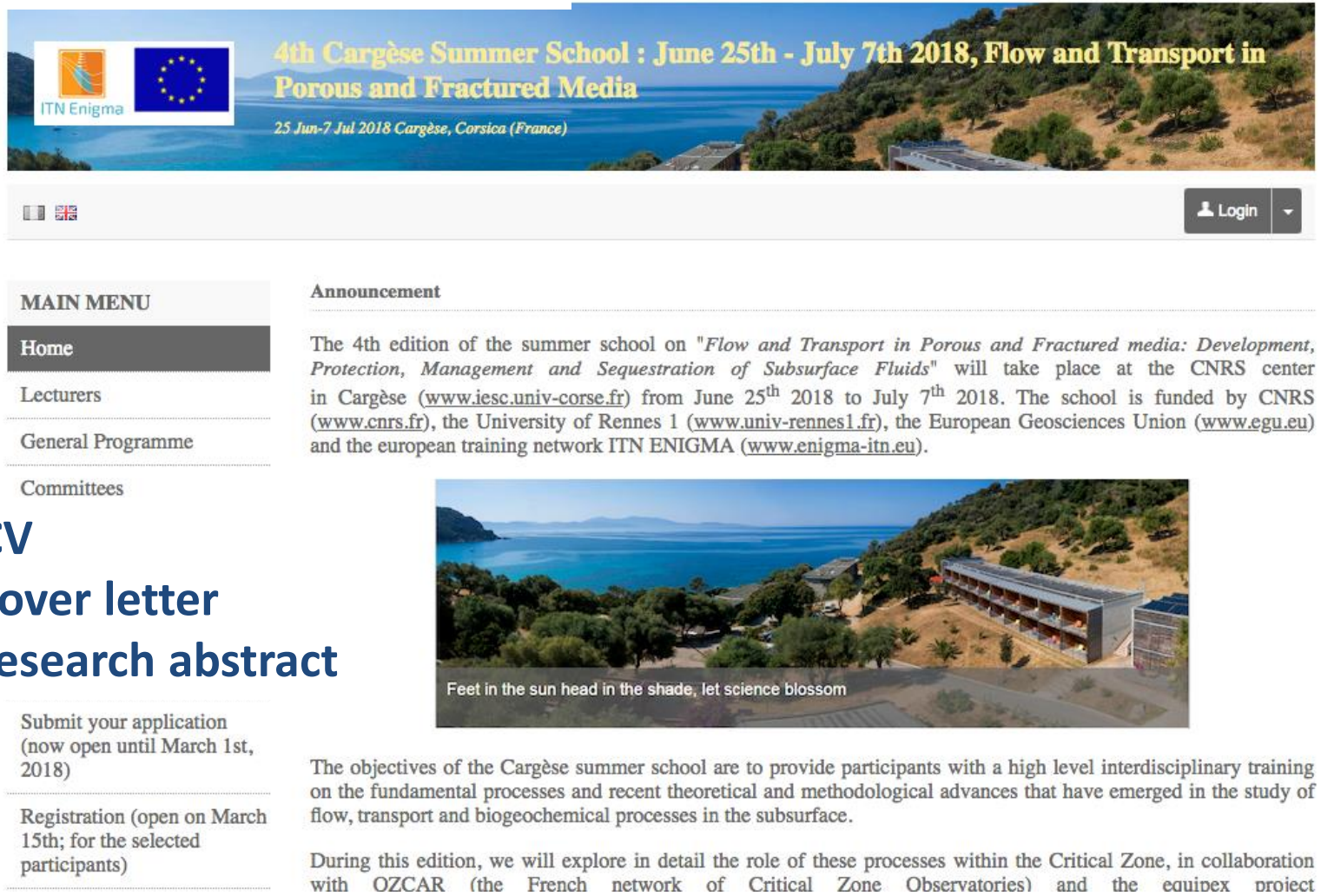
Deadlines: Online application March 1st

https://cargese2018.sciencesconf.org



- **CV**
- **cover letter**
- **research abstract**

June 25-July 6, 2018

See you there !

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