

POLITECNICO DI MILANO



POSTDOCTORAL POSITIONS IN HYDRAULICS AND ENERGY ENGINEERING

The Politecnico di Milano (Department of Environmental, Hydraulic, Infrastructures and Survey Engineering, DIIAR, and Department of Energy) is advertising two positions at the post-doctoral level on the following research topic: Modeling multi-scale processes for two- and three-phase flows in the context of Water Alternating Gas (WAG) practices.

Project Description: Characterize two- and three-phase flow through fundamental theoretical/experimental/numerical research. Activities will include development of (a) theoretical formulations for upscaling of multi-phase flows (from pore- to core- scale) to assess limits of validity of continuum depictions (including the concepts of phase relative permeabilities), (b) numerical simulations of the pore scale processes by means of Computational Fluid Dynamics (CFD) and pore-network concepts and tools, (c) theoretical framework conducive to the design of effective pore- and core-scale experiments. Specifics goals of the project are (a) development of a numerical model (based on CFD concepts) to simulate multiphase processes at the pore scale (in the presence of complex geometries), (b) analysis (*e.g.*, starting from volume averaging techniques) of the range of validity of macroscopic approaches based on the extension of Darcy's Law to model two- and three-phase flow processes in porous and fractures media. The work will be performed in close collaboration with Eni's E&P Division.

Projected Duration of Appointment: 2 years (possible extension of 1 additional year).

Educational Requirements and Experience: Ph.D. in Physics, Applied Mathematics, Energy Engineering, Geochemistry, Computer Science, Computational Fluid Dynamics, Environmental Sciences, Environmental Engineering, or closely related fields. Experience at University and/or Research Institutions on research topics associated with industrial applications is a preferred requirement.

Work contract conditions: Each post-doctoral fellow will perceive a net salary of 33000 Euro per year plus benefit to be defined according to achieved results.

(S)he will participate in the scientific activities of his/her department, in particular in seminars and working groups. The post-doctoral fellow is expected to work both independently and as a member of the project team. The post-doc is supposed to interact with Eni's E&P Division, have ability to plan and organize the work, and be able to communicate the scientific results, both to public and industry and through scientific publications. The selected post-doc will write a report on his/her scientific accomplishment on a bi-monthly basis, comparing it to his/her initial project, and describing his/her subsequent objectives. At the end of the project (s)he will also write a complete report on the work performed and on the results obtained.

Scientific Contact/Principal Investigator (PI): Alberto Guadagnini, Ph: + 39 02 2399 6263, e-mail: alberto.guadagnini@polimi.it

Application procedure and information: The official international call will be open at the end of December 2010. Candidates who are interested are encouraged to contact the PI for information.

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