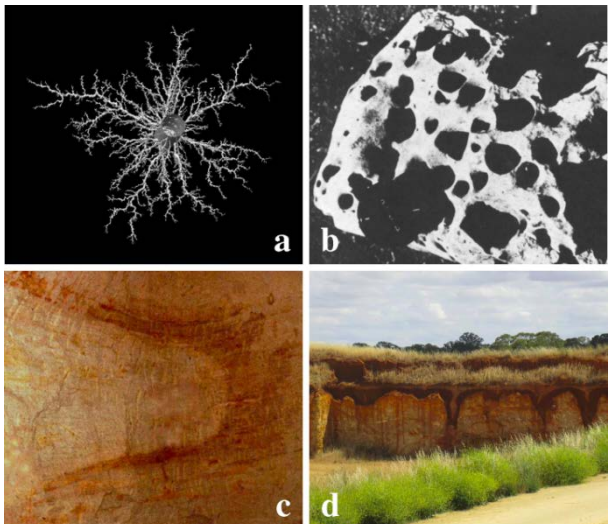
NATIONAL SCIENCE CENTRE
POLAND

UNIVERSITAS VARSOVIENSIS

Postdoctoral Researcher position at the University of Warsaw

Reactive Flow in Porous Media

Postdoctoral position at the Faculty of Physics, University of Warsaw in the group of Piotr Szymczak. The project involves the analysis of pattern formation in dissolving porous rocks. Strong coupling between the flow and dissolution in such systems may lead to the spontaneous formation of pronounced dissolution channels ("wormholes"). The form of these channels and speed of their advancement depend on the flow rate, reaction rate and porosity difference between dissolved and undissolved mineral, but there is as yet no theory or deeper understanding of the exact form of this dependence. In the project, we will attack this problem by the combination of numerical modeling and analytical approaches. Hence we seek candidates with expertise in one or more of the following areas: numerical modeling of reactive transport in porous and fractured media, multiphase flow, physical processes in geology, geochemical self-organization or applied mathematics (Stefan-like problems, Loewner evolutions etc.). A strong background in continuum mechanics and fluid dynamics, and fluent English are also necessary.



Examples of patterns produced by the dissolution-precipitation processes in rocks: (a) wormholes (30 cm long) produced during carbonate acidization (b) holes formed by limestone dissolution (5–10 cm across) (c) a uranium roll (~1 m), and (d) terra rossa fingers (~10 m).

Funding will initially be for a period of one year, with the expectation of renewal for a second year based on satisfactory performance. The gross salary is 8800 PLN (~2000EUR) per month. Inquiries and applications should be sent by email to Piotr.Szymczak@fuw.edu.pl. Applications should include a detailed CV, a brief statement of research interests and two names of potential referees. Complete applications should be received before November 15, 2013 for full consideration. Later applications will also be accepted until the suitable candidate is identified.

More information about the research in the group: http://www.fuw.edu.pl/~piotrek