

The Warsaw Doctoral School in Natural and Biomedical Sciences and the Institute of Physics PAS cordially invites you to a **SPOTLIGHT TALK**

Evaporation and Capillary effect in Porous Media: Witch scales and physics?

given by

Prof. Dr. Ing. Rachid BENNACER

Labo LMPS / Dpt Enseign./Recherche : Génie Civil & Envir., Paris, France

on 21st June 2024, 11:00 at the IP PAS Leonard Sosnowski Auditorium

Duration: 45 min + question time

The event will be available on ZOOM also, [at this link](#)

All Warsaw-4-Phd students (and others) very welcome!

Abstract of the talk:

In the first part, the talk will focus on capillary rise mechanisms in heterogeneous porous material with different capillary sizes. Both theoretical and experimental work are performed to investigate the time evolution and the exchange at the interface of different porous media. It contains the homogeneous capillary (without layer exchange), which is presented to distinguish the different characteristic times and the liquid capillary rise regimes. Considering gravity effect, shear stress and inertia, three regimes are distinguished theoretically and experimentally based on these two dimensionless parameters (**Bo** and **Ga**). Theoretical analysis and simulation results show the capillary rise in tendency and the appearance of oscillatory phenomenon. The heterogeneous porous media are also investigated. A multilayer domain is adopted to model the multiple distribution in capillary sizes. The interaction between these layers (different equivalent capillary sizes) demonstrate how the cooperation appears in nature so as to fit with the optimal situation of fast filling the porous media or the equivalent in drying. Experimental results on both homogeneous and heterogeneous cases have a favorable effect on the imbibition enhancement. In the second part, the talk will complete with the local and global evaporation in such complex porous media.

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About the speaker:



Prof. Dr. Ing. Rachid BENNACER: is an Engineer in Mechanical field (1989), and he got his PhD thesis at Pierre et Marie Curie University (Paris 6) in 1993. He worked as lecturer in the University Paris XI (1993/94), became an associate professor at Cergy Pontoise University in 1994 and full Professor in 2008. He moved as senior Professor to the prestigious school Ecole Normale Supérieure (Paris-Saclay) since 2010. He becomes in 2017 an Exceptional National Class Professor. He is also adjunct professor at Tianjin Uni. Of comm. (China) and UMB Univ. He assumed several responsibilities, director of the LEEVAM research team (2003-2007), Licence degrees & Aggregation title (2008-2011), Master research degree (2011-2013), Transfer and Environmental Research Unit (CNRS LMT-Lab) (since July 2012), dean of Civil/Environmental department

(Oct. 2012/Sep. 2016) and 2019/2023 Coordinate International Affairs Related to Ph.D Univ. Paris-Saclay; President of ENS Paris-Saclay Special Executive committee and vice Dean of the ISI Graduate school. His present research activity is within the LMPS laboratory. His Research field covers wide spectrum and several domains. It covers the building material for energy applications or on durability aspect, renewable and energy system. The expertise covers the direct numerical simulation including CFD coupling on multi-scales. The previous approach is consolidated by analytical or reduction approach in order to identify the instabilities and global behavior bifurcation and similarity controlling parameters in multiphysics situations. He published around 10 book chapters and more than 300 referenced international journals (Rank A).