FORTH / ICE-HT

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SPEAKER: **Pierre Aimar, Research Director**
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THEME: **Kinetics aspect of colloidal aggregation induced by filtration**

PLACE: FORTH/ICE-HT auditorium

DATE: Wednesday, 20th of June, 2007

TIME: 17:00

ABSTRACT: The lecture will cover two examples of our research: a theoretical work on membrane fouling, and a more recent experimental research on transmission of bacteria through UF/MF membranes.
In the first part of the lecture, we'll start from the well established concept of gel polarization and the more recent one of critical flux, and make a critical analysis of these models, with regards to practical observations made during membrane operation in labs or in industry. From this, we shall look in more details at some of the mechanisms which trigger colloidal fouling, from a theoretical point of view. We shall pay special attention to the existence and shape of the energy barrier which stabilizes colloids. I assume then that when colloids are packed together by drag forces due to filtration, this is equivalent to this energy barrier being lowered: A simplified kinetics model is derived from this assumption, and I shall discuss the possible consequences of this kinetics on fouling mechanisms in membrane processes, at lab, pilot or industrial scale.
In the second part of the lecture, I will report on our recent experimental work on the transmission of bacteria through porous membranes. Some anomalous behaviours are examined from the point of view of the bacteria membrane stiffness, and the question of removal of bio contaminants is briefly discussed.