**Lecture : From the brain to water uptake of roots to fuel cells: - porous media are "almost" everywhere –**

Porous media are almost everywhere. The understanding of flow, transport and deformation processes in porous media is important for the optimization of fuel cells, energy storage, the prediction of landslides due to heavy rainfall or the spread of tumors in human tissue.

In this lecture, we will give a first a brief overview of the importance of porous media; using selected examples, we will cover the range from environmental to technical and relevant bio-issues.

In the second part, we would like to present selected modelling approaches and analyses using two concrete application examples:

* Firstly, for the release multiple sclerosis, we can use knowledge about prose media to help make better predictions. What happens in the porous medium "brain" when the blood-brain barrier no longer functions properly? How can research in the field of porous media positively influence the treatment of multiple sclerosis?
* On the other hand, I would like to discuss with you whether we can improve water management in fuel cells as a drive technology with our knowledge of porous media. What role does the understanding of porous media play in the context of alternative forms of mobility such as fuel cells? Are our "classical models" for water transportation helpful?

This is where simulations help, because they make the invisible processes in the brain and in the fuel cell visible (I hope).