



**UNIVERSIDADE FEDERAL DA PARAIBA-UFPB  
CENTRO DE INFORMÁTICA-CI**



## **PALESTRA**

# **Hysteretic Enhancement of Carbon Dioxide Trapping in Deep Aquifers**

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**Horário: Dia 18/06/2019 às 14:00h**

**Local: Auditório do CI-UFPB/Mangabeira**

**APOIO: CI/UFPB**

**Obs. A palestra será apresentada em português.**

**Abstract:** The sequestration of supercritical carbon dioxide in saline aquifers has been proposed to mitigate global climate change. An important issue is whether it escapes to the atmosphere: chemical retention, for instance, is permanent in well chosen aquifers. The effects of chemical reactions may take time, so one needs short-term containment techniques such as CO<sub>2</sub> capillary retention enhanced by permeability hysteresis during water imbibition. This retention is predicted in a class of permeability models for the capillary-dominated regime. Here, we use high-quality laboratory-measured permeabilities as well as exact analytic solutions and accurate simulation techniques to quantify the amount of carbon dioxide that can be trapped. This study on one-dimensional, vertically upward flow demonstrates that under ideal conditions, all of the carbon dioxide is immobilized permanently. This is achieved by a trapping shock due to switching under hysteresis from CO<sub>2</sub> to chase-brine injection. This shock is peculiar: it possesses a very small amplitude but a large speed, making it difficult to simulate and detect.