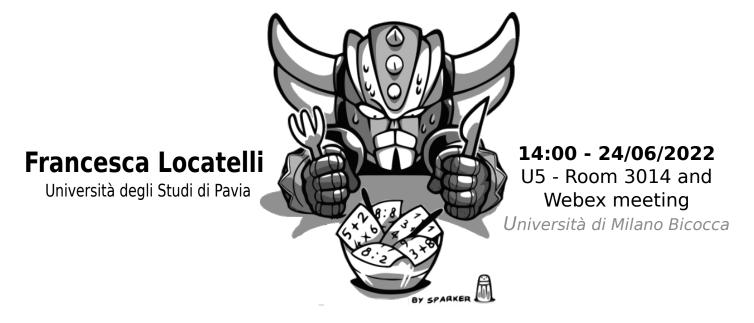
Insalate di Matematica *presents*

How not to blow up the Earth



Abstract

Carbon dioxide (CO2) is the primary greenhouse gas emitted through human activities and causing global warming. Carbon Capture and Sequestration (CCS) is a relatively new technique designed to reduce the amount of atmospheric CO2, and it aims at injecting this pollutant into deep geological structures. For this reason, it is fundamental to be able to simulate the long-time behaviour of fluid mixtures containing CO2 once stored.

In this talk, we detail a mathematical model describing the flow of these mixtures inside a porous medium. The equations in this model form a system of fully-coupled non-linear PDEs, which cannot be analytically solved. We then review some numerical methods able to recreate these dynamics and highlight the improvements achieved throughout the last decades.



Keywords:

multi-phase fluid flow · porous media · finite volume · discontinuous galerkin

"Obvious" is the most dangerous word in mathematics. - Eric Temple Bell

