

The characterization and the understanding of flow of fluids within rocks and granular media has become an ever-increasing problem in Earth Sciences, Physics, and in many industrial applications, including CO₂ sequestration, hydrocarbon migration, ore deposit development, and radioactive waste disposal. One of the main problems is the understanding of flows in transforming porous media (PM), where the rocks and fluid pathways evolve spatially and temporally, for example due to chemical interactions with the flow, to changing stress or due to compaction of the solid matrix. The dynamic feedbacks between flow, destruction of permeability due to compaction or local precipitation, and creation of permeability due to dissolution, chemical reaction or fracturing, makes understanding of such complex systems a challenge. Such feedbacks between flow of fluids and PM in which they are flowing, are important in both relatively slowly deforming PM such as in naturally evolving reservoirs, and in rapidly evolving PM such as fluid-filled fault zones or soils experiencing earthquakes, rapidly flowing grain-fluid mixtures in debris flows, or industrial processes in petroleum production such as pyrolysis or hydrofracking. We invite contributions that study the feedback mechanisms and their impact on the porous media through interdisciplinary approaches.