

# Multiscale and reduced-order modeling for poroelasticity

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## Short Description

Poroelasticity modeling is an important tool in understanding the behavior of complex materials by surrogating the interaction between solid and fluid phases into effective descriptions. However, in several cases the poroelastic models, the numerical methods, and the computational strategies to solve the resulting equations, need to be adapted to correctly handle processes on multiple scales, hierarchical structures, and/or non-linear mechanical responses, in order to correctly represent the physical behavior of the material of interest at the coarse scale. This upscale process is particularly important in the context of data-driven modeling, where the availability and quality of data is limited.

The goal of the Minisymposium is to bring together experts in different fields relevant to the efficient, robust and accurate modeling of poroelastic dynamics, promoting the exchange of ideas, discussing numerical and computational challenges, and sharing lessons learned in working in different application fields. Particular topics of the meeting will be analysis and implementation of modern multiscale and mixed-dimensional methods for poroelasticity and for fluid-structure interaction, immersed methods, reduced-order modeling, and stabilized finite element discretizations. Further topics of interest include the application of these numerical methods in the context of inverse problems for parameter estimation and data assimilation. Submission of relevant works with applications in biology, medicine, engineering and geosciences are welcome.