Measuring the impact of nanoscale features on oil and gas recovery

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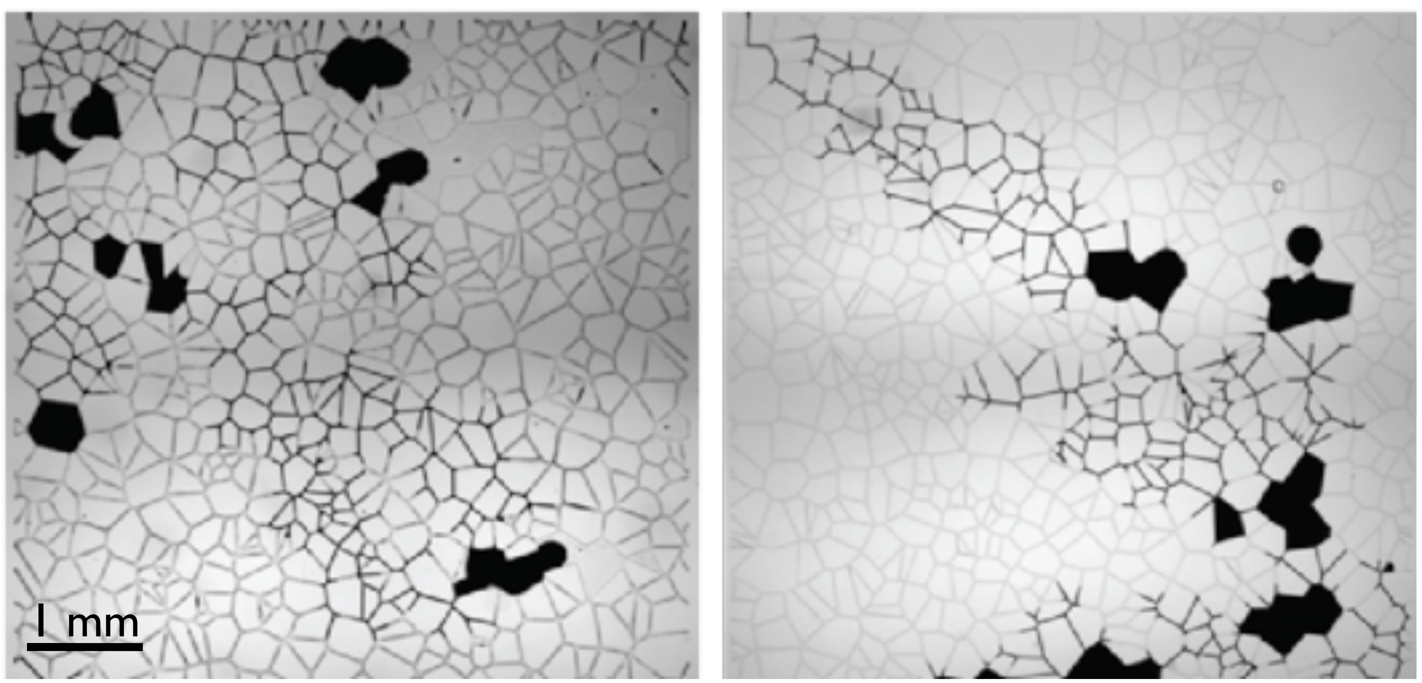
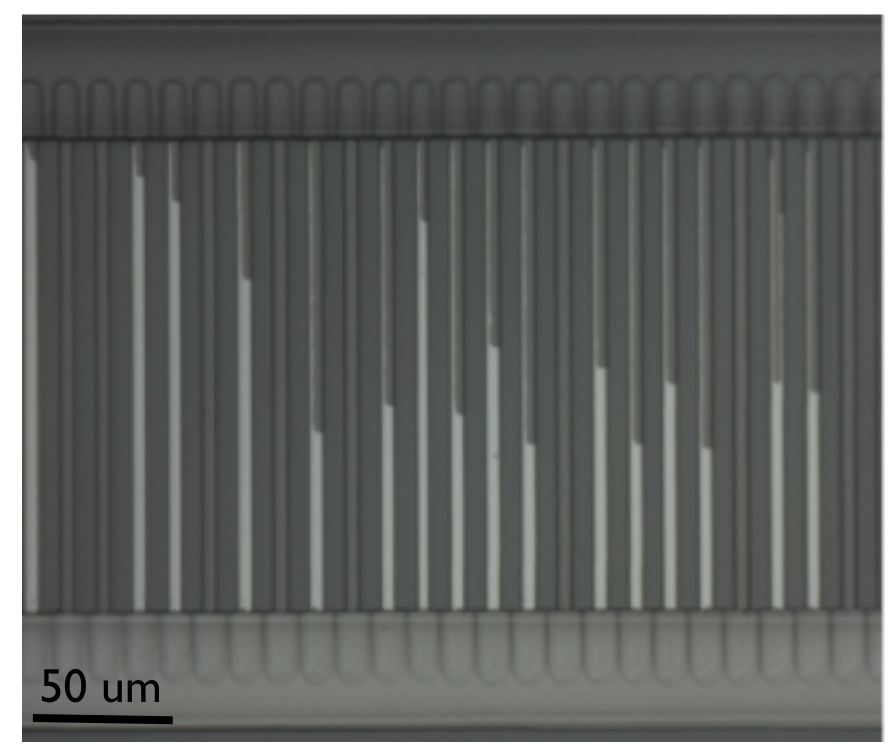
Micro- and nanoscale porous media analogs (PMA) have been fabricated into a variety of materials including elastomers, thermosets, silicon and glass. We use PMA to study fluid and solute transport in networks the mimic the geometric and environmental conditions of real reservoirs. We are currently focused on measuring solute transport between microscale and nanoscale pores using tracer transit time measurements and macrotransport theory.



Displacement of oil (clear fluid) by brine (dark fluid) in a pore scale network typical of carbonate formations. Channels have a 10 um x 10 um cross-section. The effect of hydrophilic (left) and hydrophobic (right) walls is shown.

Our work on two-phase flow in porous media analogs was featured on the cover of Lab on a Chip, Vol 12, January 2012.



Gas (light fluid) displacement of brine (dark fluid) in 100 nm X 5 um channels.

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