

Yield-stress fluid fingering instability



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This fingering instability arises when one fluid displaces another. In this image, a green paint with a yield stress of 10 Pa was squeezed between two 14cm petri dishes, one glass and one plastic. Pulling the dishes apart displaces the paint with air, resulting in a highly branched pattern. This structure is only held in place due to the yield stress of the paint, enabling its study. This fractal-like instability is reminiscent of phenomena as diverse as lightning strikes and blood vessels, and is relevant to understanding the behavior of surface adhesives as well as controlling fluid flows.