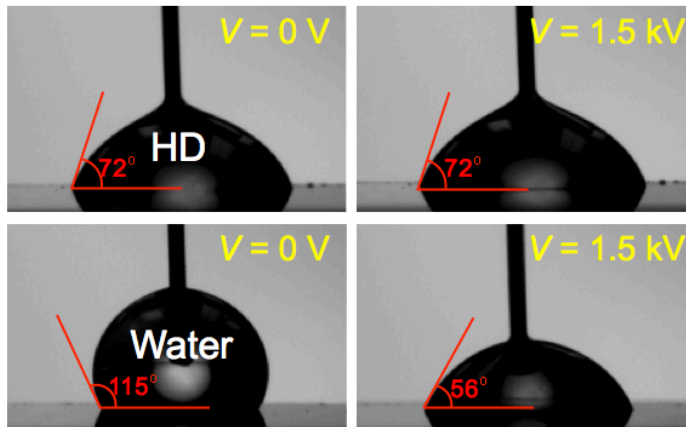
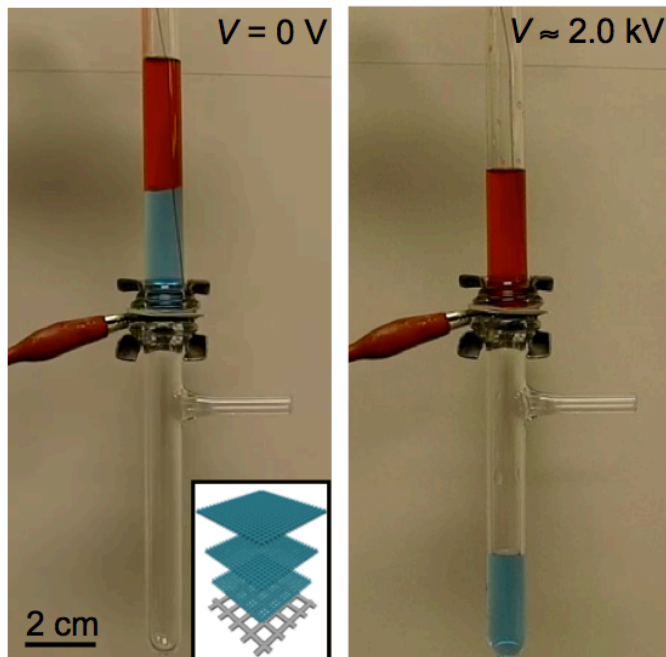


# Hygro-Responsive Surfaces: A New Approach for Oil-Water Emulsion Separation



PI: Prof. Anish Tuteja, University of Michigan

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In this work, we have developed the first-ever membrane-based, *single* unit operation that allows for the gravity driven, *on-demand* separation of various oil-water mixtures. Using our methodology, we demonstrate the *on-demand* separation of free oil and water, oil-in-water emulsions and water-in-oil emulsions, with  $\geq 99.9\%$  separation efficiency. We also develop a scaled up apparatus to separate larger quantities (several liters) of oil-water emulsions.