

Growing elastomeric stalactites

Barath Venkateswaran¹, Lauren Dreier²,
Trevor J. Jones^{1,3}, P.-T. Brun¹

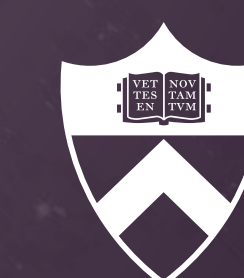
¹Chemical and Biological Engineering, Princeton University, NJ 08544

²School of Architecture, Princeton University, NJ 08544

³Mechanical Engineering, Carnegie Mellon University, PA 15213

Instabilities are all around us in nature. Our system involves the Rayleigh-Taylor instability, where we coat a cylinder with a thin film of curable elastomer and spin it about its axis. The centripetal forces act on the thin film and destabilise it, while the capillary forces in the film will try to minimise the exposed surface area and try to stabilise it. This interplay between different forces spontaneously forms a self organised array of cured drops on the cylinder surface. This process of coat-destabilize-cure can be repeated multiple times on previously cured layers to eventually form a forest of soft and slender stalactite-like projections (red and blue dye used alternatively for ease of visualisation).

(Sample goes here)



PRINCETON
UNIVERSITY



NSF CAREER
CBET 2042930