

Abstract Submitted  
for the DFD20 Meeting of  
The American Physical Society

**Formation, growth and coalescence of nanoscopic mesas in stratifying foam films**<sup>1</sup> CHENXIAN XU, SUBINUER YILIXIATI, VIVEK SHARMA, University of Illinois at Chicago — Ultrathin micellar foam films exhibit stratification due to confinement-induced structuring and layering of micelles. Stratification proceeds by the formation and growth of thinner domains at the expense of surrounding thicker film, and flows and instabilities drive the formation of nanoscopic terraces, ridges and mesas within a film. The detailed mechanisms underlying stratification are still under debate, and are resolved in this contribution by addressing long-standing experimental and theoretical challenges. Thickness variations in stratifying films are visualized and analyzed using interferometry, digital imaging and optical microscopy (IDIOM) protocols, with unprecedented high spatial (thickness <100 nm, lateral  $\sim$ 500 nm) and temporal resolution (<1 ms). Using IDIOM protocols we developed recently, we characterize the shape and the growth dynamics of mesas that flank the expanding domains in micellar thin films, and we track their evolution, as well as coalescence dynamics.

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Date submitted: 10 Aug 2020

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