

1154-49-1206

**Salvatore Stuvard\*** ([stuvard@math.utexas.edu](mailto:stuvard@math.utexas.edu)). *A capillarity theory approach to the analysis of soap films.*

Minimal surfaces, namely surfaces with everywhere vanishing mean curvature, are the classical model for soap films spanning a given boundary wire. A major drawback with this model is the complete lack of a length scale capturing the mechanical properties of soap films due to surface tension. In this talk, I will discuss how this issue can be overcome by modeling soap films as “thick” sets of finite perimeter enclosing a small given volume and satisfying a suitable spanning condition. I will investigate the existence theory for the corresponding variational problem, as well as the geometry of the minimizers. Then, I will show how this approach allows to recover the classical Plateau’s problem in the limit as the enclosed volume approaches zero. Open problems and future directions of research will conclude the presentation.

This is based on joint works obtained in collaboration with Darren King (UT Austin), Francesco Maggi (UT Austin), and Antonello Scardicchio (ICTP Trieste). (Received September 13, 2019)