

## MECHANICAL ENGINEERING STUDENT SEMINAR

**Sunday, December 11 2022 at 14:30**, D. Dan and Betty Kahn Building, Auditorium 1.

### **Marangoni-based geometrical low-pass-filter**

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Smooth surfaces play a key role in a wide range of technological applications. The use of modern additive manufacturing methods is widespread, yet most of these methods produce rough surfaces. We present a novel approach that utilizes the Marangoni effect and capillary forces to replicate a base-line surface, while preserving the long waves and eliminating short waves associated with roughness. A thin liquid film is positioned on top of a solid surface, and is subjected to thermal boundary conditions. Using the relevant evolution equation of the free-surface film, we demonstrate that temperature-induced changes in surface tension mimic the bottom surface, while curvature changes in Laplace pressure smooth the top surface. The ratio between the two effects can be adjusted, similar to a low pass filter with a variable threshold.

Note: the seminar will be given in English