

Speaker: Stephen W. Morris

Time: 3:00 pm – 4:00 pm

Location: Marcus Nanotechnology 1116-1118

Title: Why are there ripples on icicles?

Abstract: The shape of an icicle emerges from a subtle feedback between ice formation, which is controlled by the release of latent heat, and the flow of water over the evolving shape. The water flow, in turn, determines how the heat flows. Many natural icicles exhibit a mysterious ripply shape, which is thought to be the result of a morphological instability. The wavelength of the ripples is always close to 1cm, and is remarkably independent of the growing conditions. Similar ripples are also observed on stalactites, although certain details of their formation differ. We built a laboratory icicle growing machine to explore the physics of icicle ripples. We learned the subtle role played by impurities, and succeeded in deepening the mystery of the origin of the ripples. Work done with Antony Szu-Han Chen and John Ladan.