

Abstract:

Nucleation is the starting point for the formation of a new phase of a substance, e.g., the formation of solid ice from liquid water. It occurs throughout nature, such as in the formation of clouds in the atmosphere, and biomineralization of bones and shells of animals. Nucleation also has tremendous economic significance in forming and processing high-value materials such as pharmaceuticals, pigments, and ingredients for food. But studying nucleation is incredibly difficult due to its stochastic nature: you generally don't get to control where and when it happens. In this talk we will introduce the effect of non-photochemical laser-induced nucleation, outline some of the mechanisms that have been proposed for the effect, and its possible applications. We will draw comparisons with other well-known but poorly understood methods for nucleation by external perturbation, such as mechanical shock and irradiation by ultrasound.