Fiber networks are ubiquitous in natural and manmade materials. Examples include biopolymer networks in the cytoskeleton and extra-cellular matrix which play important roles in biological processes, as well as various types of paper and fabrics which we encounter every day. Fiber networks exhibit unusual mechanical properties, such as strongly nonlinear elasticity. Understanding these mechanical properties is key in designing new fiber network materials that has controllable mechanical behaviors. In this talk, I will present our recent theoretical progress in understanding an underlying mechanical critical point that controls linear and nonlinear elasticity of fiber networks, and also discuss our ongoing research about fracturing of fiber networks.

Hosted by James Sethna