

报告题目及摘要 / Title & Abstract *	
报告人 / Author	Kaichun Li
报告题目 / Title	Surface tension effect on flexoelectric energy harvesting based on isogeometric analysis
摘要 / Abstract	<p>Surface tension is an important factor in the deformation of fluids but is often neglected in solids. However, forces due to surface tension can induce significant deformations in soft solids, leading to elasto-capillary phenomena. Here, we study the impact of surface tension at the fluid/solid interface on the mechanical and electrical responses of fluid inclusions in a soft solid matrix. When the characteristic length of surface tension -- the elastocapillary length L is much smaller than the characteristic radius R of the fluid inclusion, surface tension increases the stiffness of the structure. Based on a combination of isogeometric analysis (IGA), level set method and point wise density mapping techniques, we study the influences of surface tension on the flexoelectric energy harvesting system at micron and nanometer scale through numerical examples of a linear dielectric solid including a cantilever beam under a point load and a truncated pyramid under compression. The interface of the fluid/solid is implicitly represented by a level set function. These results show that the significant enhancement in electromechanical coupling coefficient can be obtained when considering the effect of surface tension and the energy conversion rate of the flexoelectric devices increases as the area ratio of the inclusions to the substrate increases.</p>