

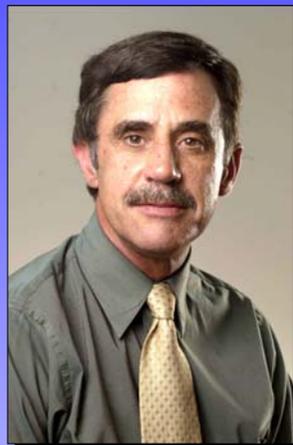


Distinguished Lecture Series



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Wrinkles, Scars and Thin Polymer Films

Ultrathin films, prepared from polymers or crosslinked nanoparticle assemblies, bend and fold when suspended in a fluid. The separation distance between the folds and the opening angle of the folds depend upon the bending modulus of the film. This provides a unique opportunity to probe the mechanical properties of ultrathin films. One can obtain similar information by examining wrinkles in thin films when the film is subjected to an out of plane deformation. This principle was used to characterize ultrathin polymer films floating on a water surface by depositing water droplets of known mass on the films. A generalized scaling argument, used to describe scar tissue, was found to describe the response of the thin films over a large range of thickness and deformation suggesting that the in-plane mechanical properties of the films do not depend upon film thickness, even when the thickness is comparable to the radius of gyration of the polymer.



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