Continuum Theory of Beta-Sheet Ribbons. ROUZBEH GHAFOURI, University of California, Los Angeles — We present a continuum description for the β-sheet ribbons encountered in amyloid fibrils, allowing both stretching and bending of the ribbon in response to chiral twist. The theory leads to a non-linear variant of the Worm-Like Chain (WLC). At a critical value of the ratio of the bending and stretching moduli, the Foppl-von Kármán Number, we encounter a continuous *buckling transition* from a straight Helicoid to a Spiral Ribbon. Two of the three persistence lengths of the ribbon become very short at the transition point indicating strong thermal shape fluctuations. The transition becomes discontinuous if the ribbon width is treated as a free thermodynamic variable.

Robijn Bruinsma
University of California, Los Angeles