

KS8 - Alain Goriely (University of Arizona - USA)

Elastic growth models

Abstract:

Growth is involved in many fundamental biological processes such as morphogenesis, physiological regulation, or pathological disorders. It is, in general, a process of enormous complexity involving genetic, biochemical, and physical components at many different scales and with complex interactions. The purpose of this paper is to provide a simple introduction to the modeling of elastic growth. We first consider systems in one-dimensions (suitable to model filamentary structures) to introduce the key concepts. Second, we review the general three-dimensional theory and show how to apply it to the growth of cylindrical structures. Different possible growth mechanisms are considered.