Free boundary problems arising from materials science

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Free boundary problems are partial differential equations to be solved for both an unknown function u and an unknown domain U. We will investigate the existence, regularity and asymptotic behavior of two types of stationary free boundary problems arising from materials science: The first problem is a simplified model for liquid crystal configuration which can be viewed as a coupling of harmonic mapping and minimal surface. The second problem arises from thin film equations with van der Waals force and Born repulsion force which has interesting concentration phenomenon. Recently obtained results and open problems will be discussed after reviewing physical background and past results.

The lecture will take place in Thackeray 704 at 4:00pm.
Refreshments will start at 3:30pm.