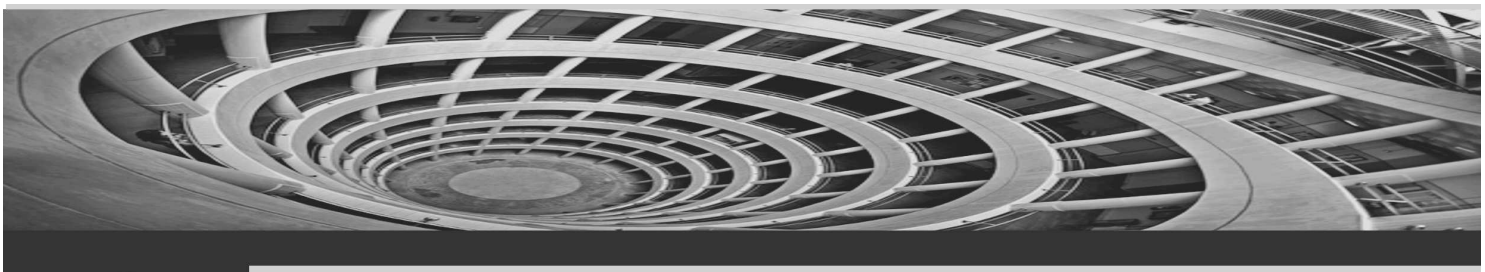


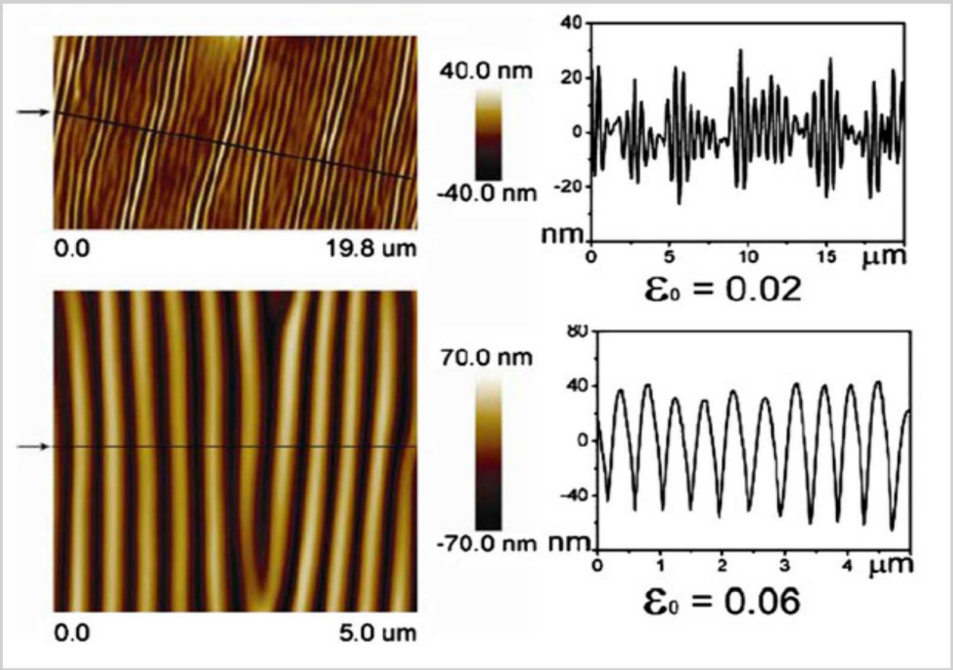
SEMINARIO INTERUNIVERSITARIO DE MECÁNICA Y MATERIALES

SEMINARIO JOSÉ ANTONIO GARCÍA GARCÍA

MÁSTER DE ESTRUCTURAS

ciencia e ingeniería de estructuras

WRINKLING MODES AND INSTABILITIES IN ELASTOMER SUBSTRATES AND BILAYERS



Prof. John W. HUTCHINSON

School of Engineering and Applied Sciences
Harvard University

Día : Lunes 14 de octubre 2013
Hora : 12:00h
Lugar : Seminario I, E.T.S. Ing. Caminos, C. y P.
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Wrinkling Modes and Instabilities in Elastomer Substrates and Bilayers

John W. HUTCHINSON

ABSTRACT

Recent research activities in soft materials have generated a rich array of new experimental and theoretical observations on wrinkling modes of compressed single-layer elastomers and bilayers comprised of a stiff thin film on a thick compliant elastomer substrate. The seminar will begin with examples drawn from experimental work by a number of investigators.

Then, an overview will be presented of recent theoretical work describing different kinds of wrinkling modes and their stability with emphasis on both initial wrinkling modes and secondary modes that arise as the compression is increased above the onset of wrinkling. Advanced localized modes such as folds, creases and ridges will be described.

Contrasts between single-layer and bilayer behaviors will be drawn. In particular, the exceptional stability of the sinusoidal wrinkling mode of a stiff thin film on a compliant substrate is contrasted the highly unstable and imperfection-sensitive behavior of wrinkling of a compressed half-space of elastomer. Wrinkling of a compressed elastomer half-space is highly unstable due to nonlinear interaction among the multiple modes leading to collapse into a finite amplitude crease.

SHORT BIO

John Hutchinson works on problems in solid mechanics concerned with engineering materials and structures. Buckling and structural stability, elasticity, plasticity, fracture and micro-mechanics are all figure prominently in his research. Examples of ongoing research activities are
(1) efforts to extend plasticity theory to small scales,
(2) development of a mechanics framework for assessing the durability of thermal barrier coatings for gas turbine engines,
(3) the mechanics of ductile fracture and its numerical simulation, and
(4) the mechanics of thin films, coatings and multilayers.

Hutchinson is the Lawrence Research Professor of Engineering at Harvard University where he has been on the faculty for almost 50 years. He is a member on the U.S. National Academy of Engineering and National Academy of Sciences and a Foreign Member of the Royal Society of London.

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