



UNIVERSITÀ DEGLI STUDI
DI TRENTO

Dipartimento di Ingegneria Civile,
Ambientale e Meccanica



Instabilities and nonlocal
multiscale modelling of
materials

erc-instabilities.unitn.it



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AVVISO DI CORSO

Si comunica che **mercoledì 09 aprile 2014 a partire dalle ore 11.15**
si terrà presso l'aula **R2** (via Mesiano 77) il seguente corso

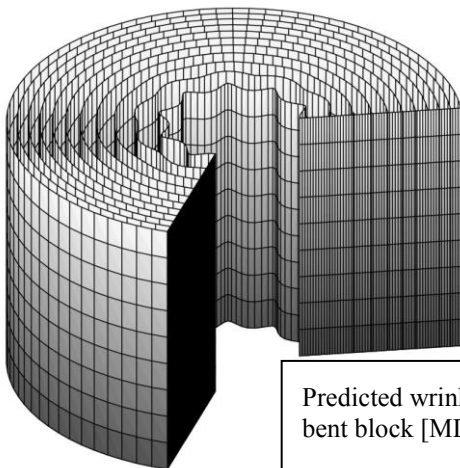
Wrinkling of soft matter under large deformation

Prof. Michel Destrade

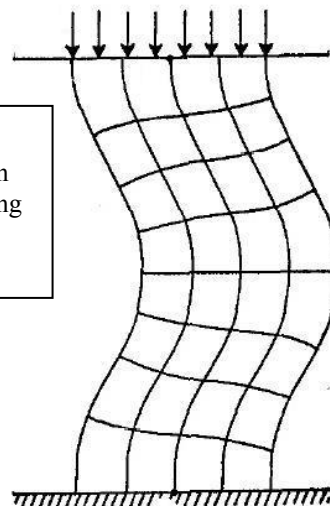
Applied Mathematics, National University of Ireland Galway
Mechanical Engineering, University College Dublin

Half a century ago, Maurice Biot predicted that when a semi-infinite soft solid is subject to a large compression, its surface eventually buckles and witnesses the formation of small-amplitude wrinkles. The Biot surface instability phenomenon is the bedrock of countless stability analyses and has been linked in particular to the appearance of wrinkles in tissue growth, hydrogel swelling, tubular organs expansion or constriction, brain sulci, etc.

Here we present theoretical, numerical and experimental studies of incremental wrinkles, such as those that appear on the compressed side of bent (or conversely, straightened) blocks and sectors, on the face of compressed tubes or twisted cylinders, or on the surface of gelatin blocks subjected to simple shear. In the latter case we investigate the possibility of 'oblique' wrinkles.



Predicted wrinkles on a bent block [MD 2008]

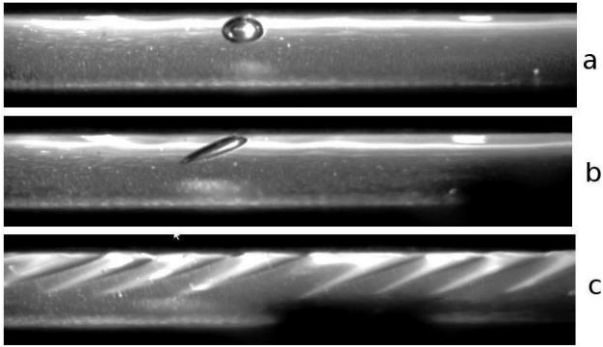


Thick column buckling [Biot 1963]

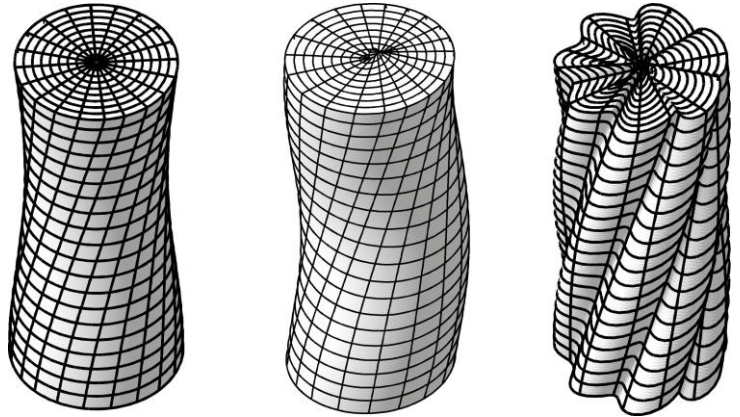


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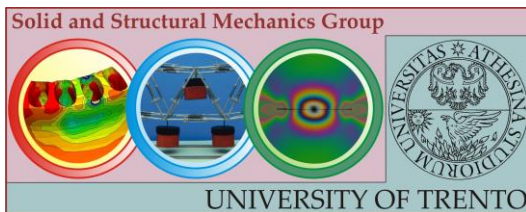
Twisting a gel in a rheometer until it wrinkles
[Mora et al. 2011]



Potential twisting modes of wrinkling for a soft
cylinder [Ciarletta & MD, 2014]

Tutti gli interessati sono invitati a partecipare.

Il seminario è organizzato dal gruppo di Scienza delle Costruzioni
(D. Bigoni, L. Deseri, N. Pugno, M. Gei, F. Dal Corso, A. Piccolroaz, R. Springhetti)



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