ulm university universität
uulm

Einladung
zum
Physikalischen Kolloquium

Montag, 11.04.2011
16:15 Uhr in O25/H7

Rafi Blumenfeld

1. Biological and Soft Systems, Cavendish Laboratory, Cambridge
2. ESE and ISP, Imperial College London

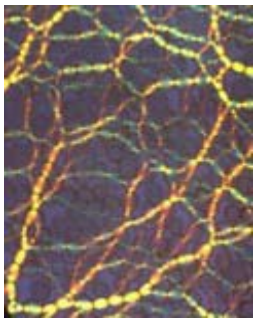
Controlled force mediation in the cytoskeleton: A dream model awaiting experimental verification

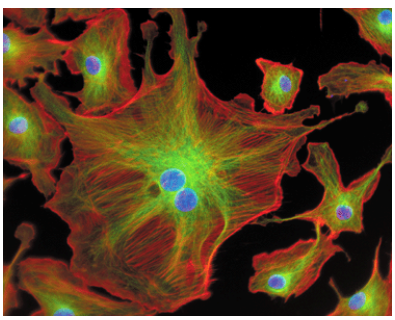
Forces applied at cell membranes are transmitted non-uniformly over large distances across the cytoskeleton (CSK). This led to suggestions that the discrete nature of the CSK plays an important role in the cellular stress transduction.

However, it is not fully appreciated that discreteness in itself is not sufficient to enable the ‘action at a distance’ observed in cells. Rather, to transmit a stimulus from the membrane to the nucleus without grossly distorting the rest of the cell, the CSK must possess certain structural properties. These properties are discussed and a first-principles theory - Isostaticity theory – is presented for the mediation of forces in networks that satisfy these conditions. The theory makes it possible to explain observations of action at a distance and predict force paths.

The link between intracellular control over force mediation and local isostatic states provides a set of principles that may also govern reorganisation dynamics of the CSK.

Finally, experiments are suggested to test these ideas.





Organisation: **Prof. Marti, Tel.: 23011**
Prof. Plenio, Tel.: 22911
Host: **Prof. Marti, Tel.: 23011**