

# **Lipid bilayers as fluid elastic sheets: from differential geometry to membrane mediated interactions.**

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I will discuss a simple yet powerful differential geometric description of lipid membranes, which will permit us to discuss their deformation and stresses in a geometrically transparent way. In particular, I will introduce the notion of the membrane stress tensor, as introduced by Capovilla and Guven [J. Phys. A: Math. Gen. 35, 6233–6247 (2002)], and use it to make some nontrivial analytical predictions about forces which membranes mediate between particles bound to them. The material will be largely derived from a recent review I have written on this topic [M. Deserno, Chem. Phys. Lipids, 185, 11–45 (2015)].