



ESPCI
Laboratoire PMMH
10 rue Vauquelin, 75231 Paris Cedex 05



Séminaire PMMH

Bureau d'Études, Bâtiment L, 2^{ème} étage

Vendredi 2 juin 2017, 11h00-12h00

Marcelo Dias

James Madison University

Thin Elastic Structures : A roadmap from forms to functions

Thin elastic structures (e.g. plates and shells) have stimulated new approaches and applications to mechanical metamaterials as well as brought to light many fundamental questions in our understanding of shape and function. Insights of what functionality roles these structures play comes from connections between geometry and mechanics. In this talk I will attempt to discuss two representative problems in this field : (i) Kirigami (art cutting paper) mechanics and (ii) biomechanics.

(i) With a focus on the design of thin sheets patterned with cracks (cuts), we will discuss how these structures reveal new effectively non-linear and anisotropic responses to external forces and strains, thus opening the path to practical problems in linear actuation.

(ii) When humans push off against the ground during locomotion, the foot transmits the ground reaction force from the forefoot to the heel joint. Such loading causes the foot to bend in the longitudinal direction, severely so for other primates and people with flat feet. We find that the transverse arch is the key structural element of the foot that stiffens it to such deformation and thereby facilitates propulsion.

Prochain séminaire : vendredi 9 juin, Moreno Andreatta

Programme des séminaires : www.pmmh.espci.fr, onglet *Séminaires PMMH*

Contact : Antonin Eddi, Sylvain Patinet, Étienne Reyssat, seminaires@pmmh.espci.fr