

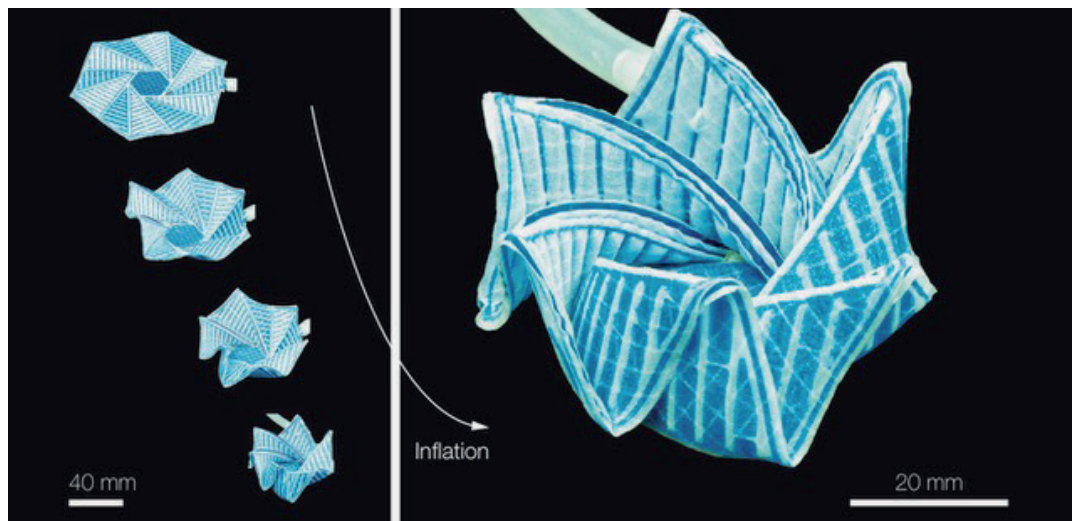
Institut de Mécanique des Fluides
2 Allée du Pr Camille Soula, Toulouse

José Bico

Professeur - ESPCI PMMH Paris

Mercredi 8 novembre à 10 h 30 • Amphithéâtre Nougaro

From planar sheets to 3D structures



Cartographers have early realized that it is impossible to draw a flat map of the Earth without deforming continents. Gauss later generalized this geometrical constrain in his Theorema Egregium. Can we invert the problem and obtain a 3D shape by changing the local distances in an initially flat plate? This strategy is widely used in Nature: leaves or petals may develop into very complex shapes by differential growth. From an engineering point of view, similar shape changes can be obtained when a network of channels embedded in a flat patch of elastomer is inflated or when extra surface gets “hidden” into wrinkles or folds in unstretchable sheets. How can we program the final shape?