Control of free boundaries in fluid mechanics and elasticity Borjan Geshkovski Universidad Autónoma de Madrid



The Great Wave off Kanagawa (神奈川沖浪裏) by Katsushika Hokusai, circa 1830.

Complex physical phenomena such as fluid flow past a wing, water waves, and more generally fluid-structure interaction (illustrated above¹), can give rise to moving interfaces called free boundaries. These objects may manifest themselves as the free surface of a liquid, or as contact lines between a fluid and a structure. In order to tackle relevant engineering problems such as the reduction of wing flutter, a complete mathematical understanding of the dynamics and the control of these objects is needed, complemented by the development of efficient algorithms and the computer implementation thereof. My research is focused on the study of these issues.

¹Source: Wikimedia Commons.