

Geometric control theory and Microswimmers
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The talk will give an overview of the locomotion problem in a fluid at low Reynolds number and recent mathematical results obtained for such problems. We will show in particular how modelization principles can rephrase the problem as a control problem linear in the controls without drift, and where the controls are given by the rate of shape changes. Borrowing results from Geometric control theory permits then to show the controllability of model swimmers and understand in a whole most of the known results in the physics literature.

Most of this work is in collaboration with several people around A. DeSimone at SISSA and myself at the Ecole Polytechnique.