PLENARY SPEAKER

BIOLOGICAL AND BIO-INSPIRED MOTILITY AT MICROSCOPIC SCALES: LOCOMOTION BY SHAPE CONTROL

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ABSTRACT

Cell motility is key to many biological functions, and it is accomplished by coordinated shape changes. Locomotion strategies employed by unicellular organisms are particularly interesting because they are invisible to the naked eye, and offer surprising new solutions to the question of how shape can be programmed.

In recent years, we have studied locomotion by shape control using a variety of methods: modeling, theory, and numerical simulation, observations at the microscope, manufacturing of prototypes. A concrete case study is provided by our results on Euglena gracilis, a unicellular protist that is able to move both by flagellar propulsion and by highly coordinated changes of the shape of the whole cell body [1, 2]. We will survey the most recent findings within this stream of research, and point out to current directions and challenges for the future.

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References

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