

Abstract Submitted  
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**Self-assembled surface swimmers and micromanipulators** GALIEN GROSJEAN, MAXIME HUBERT, University of Liege, GUILLAUME LAGUBEAU, Universidad de Santiago de Chile, NICOLAS VANDEWALLE, University of Liege — Soft magnetic particles floating on a liquid can spontaneously assemble into ordered structures.<sup>1</sup> This process is controlled through the amplitude and orientation of an external magnetic induction field. Complex behaviors can arise under a time-dependent magnetic field.<sup>2</sup> In particular, assemblies of three particles or more can undergo deformations in non-time-reversible sequences, a necessary condition for low Reynolds number locomotion.<sup>3</sup> Such microswimmers can follow precisely controlled trajectories.<sup>4</sup> As a consequence, these self-assembled structures can be used as microrobots to perform different tasks, such as the capture, transport and release of a microcargo, the mixing of fluids at low Reynolds number, and more.

<sup>1</sup>N. Vandewalle *et al.*, Phys. Rev. E **85**, 041402 (2012)

<sup>2</sup>G. Lagubeau *et al.*, Phys. Rev. E **93**, 053117 (2016)

<sup>3</sup>G. Grosjean *et al.*, Phys. Rev. E **94**, 021101(R) (2016)

<sup>4</sup>G. Grosjean *et al.*, Sci. Rep. **5**, 16035 (2015)

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