Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Magnetocapillary Swimmers: a Self-Assembled System to Study Locomotion, Transport Cargoes and Mix Fluids.[1] GALIEN GROSJEAN, YLONA COLLARD, University of Liege (ULiege), MAXIME HUBERT, ULiege / Friedrich-Alexander University (FAU), ALEXANDER SUKHOV, Helmholtz Institute Erlangen-Nurenberg (HI-ERN), JENS HARTING, HI-ERN / Eindhoven University of Technology, ANA-SUNCANA SMITH, FAU / Institute Ruder Boskovic, NICOLAS VANDEWALLE, ULiege — Because of capillary forces, small objects floating on a liquid tend to aggregate. Combined with a magnetic induction field, this effect can be used to assemble soft-ferromagnetic spheres into tunable structures. When they are exposed to oscillating magnetic fields, these assemblies spontaneously move along the interface. This is due to a breaking of time-reversal symmetry in their adopted shapes. These structures are conceptually simple, chemically inert, and spontaneously form without direct intervention or complex microfabrication process. Therefore, they offer a very wide range of possibilities, from the experimental study of the basic physical principles of locomotion, to the development of complex tasks such as cargo transport and fluid mixing.

[1]FNRS PDR grant T.0129.18 / DFG Priority Programme SPP 1726 / FNRS FRIA / FNRS Grant 2.5020.11

Galien Grosjean
GRASP Lab, University of Liege

Date submitted: 29 Jul 2019 Electronic form version 1.4