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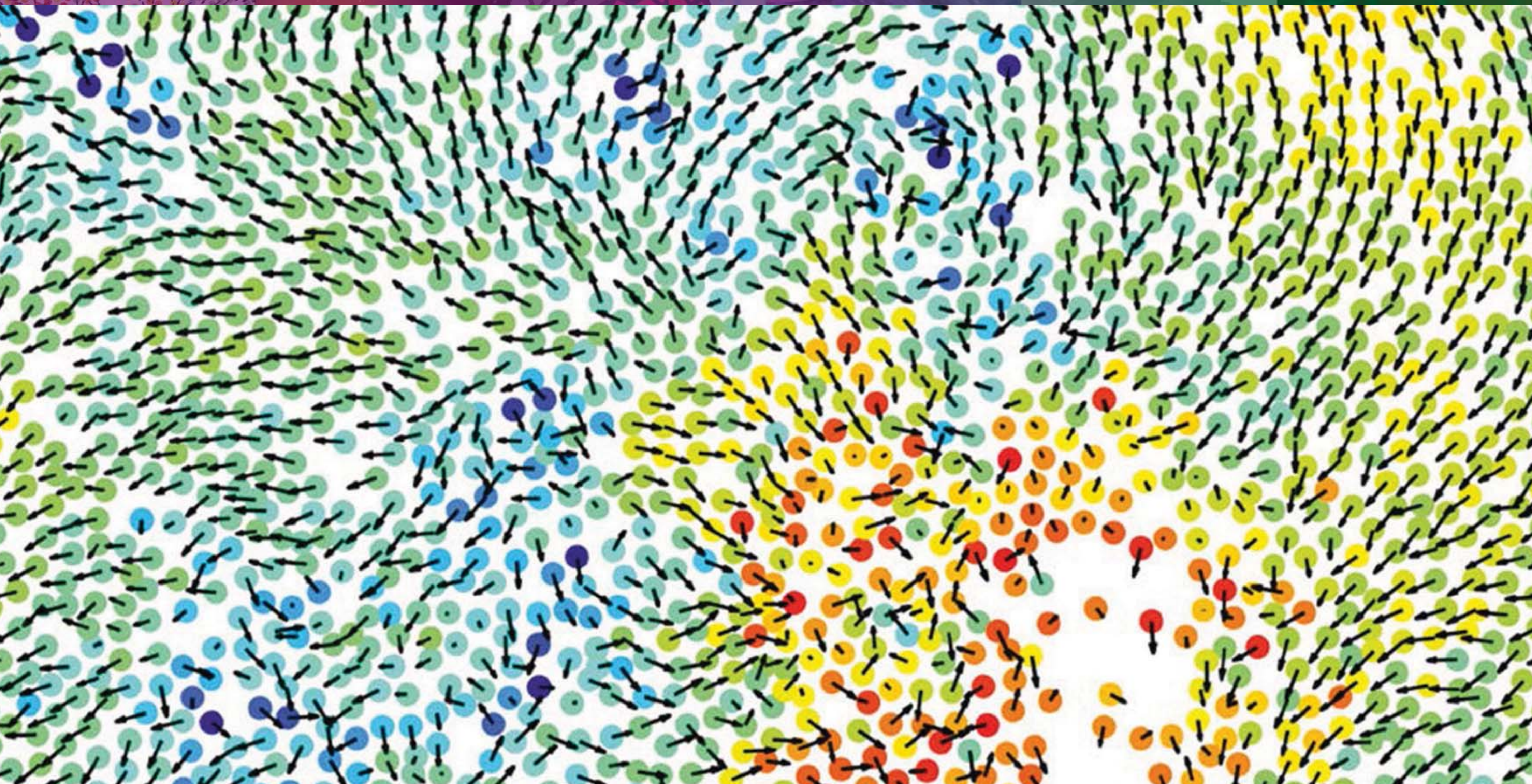
PHYSICS colloquia 2015



Micron-sized self-propelled (active) colloidal particles can serve as models for real biological swimmers. For giving better insight into the swimming properties of biological microorganisms with an asymmetric shape, we recently studied the motional features of L-shaped microswimmers under bulk conditions. However, most motile objects additionally respond to an external gravitational field, a phenomenon called gravitaxis. For many flagellates and ciliates, such as Chlamydomonas or Paramecium, negative gravitaxis has been observed, i.e. a swimming motion opposed to the gravitational field. Several photosynthetic organisms as, e.g., phytoplankton use this mechanism to control their horizontal position in water and to adjust the amount of exposure to solar radiation. Such a behavior often originates from an inhomogeneous mass distribution, which aligns the cell similar to a buoy.
In contrary, we study the motion of asymmetric L-shaped microswimmers with homogeneous mass distribution, in the presence of a gravitational force. In experiments and by theoretical modeling we demonstrate that a shape-anisotropy alone is sufficient to induce gravitactic motion.
In addition, we also discuss the motion of microswimmers on patterned surfaces and the formation of active clusters by a self-locking mechanism.
The overall aim of such studies is to understand pattern formation and emergent behavior in living systems by the use of simple model systems.

SAVE THE DATE

10FEB

Clemens Bechinger *Universität Stuttgart, Stoccarda, Germania*

Artificial swimmers as models for self-organization in biological systems

UNIVERSITÀ DEGLI STUDI DI MILANO
DOTTORATO DI RICERCA IN FISICA
ASTROFISICA E FISICA APPLICATA

L'incontro si terrà alle **ore 15:00**
nell'**aula A** del **DIPARTIMENTO DI FISICA**
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