



FAKULTÄT FÜR
NATURWISSENSCHAFTEN

Physikalisches Kolloquium

Dienstag, 16:30 Uhr, G 16/Raum 215

19. Juni 2018 Privatdozent Dr. Andreas Menzel

(Heinrich Heine-Universität Düsseldorf)

"Active microswimmers and their collective behavior"

Synopsis

Active microswimmers are micrometer-sized self-propelled agents immersed in a fluid environment. There are biological representatives, such as swimming bacteria or alga cells, or synthetic ones, like double-sided colloidal particles driven for instance by chemical reactions.

When many such agents act together in a liquid, they affect each other by setting the surrounding fluid into motion in order to propel themselves forward. This can lead to interesting emergent collective behavior, which is the subject of the presentation.

To describe such behavior of many interacting microswimmers, a statistical characterization has been developed and evaluated, as will be illustrated. On our way, aspects of the nature of swimming on the microscale will likewise be explained, as well as the background of hydrodynamic interactions in viscous fluids.

If time allows, variations of the characterization to analyze the collective behavior of microscopic circle swimmers will be added. The same applies to a brief overview of related recent studies on the emergence of ordered collective migration in crowds of self-propelled agents.