UNIVERSITA' DEGLI STUDI DELL'INSUBRIA

Dipartimento di Scienza ed Alta Tecnologia
Via Valleggio, 11 - 22100 Como
Tel. 031-2386141 - Fax. 031-2386209

Como, 26 Settembre 2017

Agli Allievi del Corso di Dottorato in Fisica & Astrofisica

AVVISO DI SEMINARIO

Il giorno 17 Ottobre, alle ore 14:30 (aula ancora da confermarsi), il prof. Francesco Ginelli dell'Uninversità di Aberdeen, King's College, terrà un seminario dal titolo

"Active matter and the physics of collective motion".

Di seguito, il sommario.

Gli Allievi, Ricercatori e Professori del Dipartimento di Scienza ed Alta Tecnologia sono cordialmente invitati.

Cordiali saluti,

Massimo Caccia
Coordinator of the graduate school in Physics & Astrophysics
Dipartimento di Scienza ed Alta Tecnologia

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Active matter and the physics of collective motion

Abstract

Active matter is composed by a large number of active particles, each of which consumes energy in order to move or to exert mechanical forces, a situation common for instance to many biological systems. Due to energy consumption, these systems are inherently out of thermodynamic equilibrium, and the study of active matter collective properties is nowadays fast-emerging interdisciplinary research field, which links out-of-equilibrium statistical physics with biological as well as engineering-related topics.

In this seminar, I will introduce the concept of active matter and concentrate on one of its most spectacular aspects, collective motion. Flocking — or collective motion — is a ubiquitous emergent phenomenon that occurs in many living and synthetic systems over a wide range of scales. Examples range from fish schools and bird flocks to bacteria colonies and cellular migrations, down to sub-cellular molecular motors and biopolymers.

Making use of analytical, numerical and experimental results, I will discuss the universal features common to this wide class of phenomena, showing how its physical properties may be largely understood as the consequence of i) the spontaneous breaking of continuous rotational symmetry and (ii) the far-from-equilibrium nature of locally interacting moving agents.