Bollettino Settimanale

Lunedì 19 febbraio 2024	Martedì 20 febbraio 2024	Mercoledì 21 febbraio 2024	Giovedì 22 febbraio 2024	Venerdì 23 febbraio 2024
AULA CONVERSI ore 14.30 **SEMINARI INFN** **Femtoscopy: a new tool to study molecular state** *Laura Fabbietti* *(Technische Universität München)* The femtoscopy technique consists in the analysis of the correlation function in momentum space for a pair or triplet of hadrons of interest and its application to pp and p-Pb collisions measured at LHC can be employed to study final state interactions among the hadrons.The ALICE collaboration recently showed that such technique can be used also to study charmed hadrons to investigate their strong residual interaction with non-charmed hadrons.A possible extension of this technique to pairs of charmed hadrons could provide a novel and conclusive methodology to understand the structure of hadronic states such as the χc1(3872) or the Tcc+.In this talk the state of the art of such studies and the future perspectives will be discussed.		**AULA CONVERSI ore 16.00** **SEMINARI STATISTICA** *Ada Altieri* *(Laboratoire Matière et Systèmes Complexes Université Paris Cité, France)* In recent times, the remarkable biodiversity characterizing natural ecosystems has gathered interest not only among ecologists but also theoretical physicists and mathematicians. Accurately quantifying the interactions within a species-rich ecosystem poses significant challenges, necessitating the use of advanced inference methods and Random Matrix Theory. In this talk, I will discuss timely questions in theoretical ecology by focusing on the Generalized Lotka-Volterra (GLV) model, which incorporates random interactions among species and demographic fluctuations [1, 2]. I will unveil a rich and, eventually, hierarchical structure of the emerging equilibria and relate the slowdown of correlation functions to aging and glass-like features. Then, I will provide a proof of concept on how this framework can qualitatively capture the complexity of the gut microbiota. This will be illustrated by metagenomic data of healthy and unhealthy patients, suffering from Crohn's disease. The different physiological states of the human gut microbiome will be shown to correspond to different noise-driven and disorder-driven regimes within the GLV model [3]. Finally, I will briefly discuss the effect of spatial dependence through a metacommunity scenario. Depending on the interplay between the dispersal rate and demographic fluctuations, unexpected discontinuous phase transitions can be pinpointed		