

Bollettino Settimanale

Lunedì 19 maggio 2014	Martedì 20 maggio 2014	Mercoledì 21 maggio 2014	Giovedì 22 maggio 2014	Venerdì 23 maggio 2014
<p>AULA CONVERSI ORE 14.00 SEMINARIO INFN-Fisica sperimentale particelle elementari</p> <p>GAP (GPU Application Project): real time applications for High Energy Physics and Medical Imaging.</p> <p><i>Matteo Bauce</i> <i>(Sapienza Università di Roma, INFN Sezione di Roma)</i></p> <p>We present results of investigation on the possible applications of Graphic Processing Units in high-energy physics and medical diagnostic, carried out within the context of the GAP project. The aim of the GAP project is the deployment of Graphic Processing Units (GPU) in real-time applications, ranging from online event selection (trigger) in high-energy physics experiments to medical imaging reconstruction. The final goal of the project is to demonstrate that GPUs can have a positive impact in sectors different for rate, bandwidth, and computational intensity. As a study case we consider the trigger system of particle physics experiment such as NA62 and Atlas, two different combination of event complexity and processing latency requirements. A fast and selective trigger algorithm represents an important ingredient for the upcoming LHC upgrades and future experiments. In a similar way, GPU can be a really powerful tool to increase the performances of medical imaging techniques, such as NMR, PET and CT. High-resolution image reconstruction techniques are based on computationally intense algorithms, that can be easily parallelized. The implementation of these on GPUs can significantly reduce the processing time, making them suitable for the use in realtime diagnostic.</p>		<p>AULA RASETTI ORE 16.00 SEMINARIO DI ASTROFISICA</p> <p>Life and adventures of binary supermassive black holes</p> <p><i>Eugene Vasiliev</i> <i>(Lebedev Physical Institute, Moscow)</i></p> <p>I will review our present understanding of the evolution of binary supermassive black holes -- how do they form, why do they eventually merge into a single black hole, and what happens afterwards, as well as discuss possible observational signatures (gravitational-wave and electromagnetic counterparts) and perspectives of detection.</p>	<p>AULA 2 ORE 15.00 SEMINARIO TEORICO</p> <p>Dynamics of inverting solutions of the tippe top</p> <p><i>Stefan Rauch-Wojciechowski</i> <i>(Department of Mathematics, Linköping University, Sweden)</i></p> <p>The tippe top is a small object (“una specie di trottola”) having the shape of a truncated axially symmetric sphere with a peg attached to its flat surface. When spun sufficiently fast on its spherical bottom the tippe top turns upside down and continues its rotating motion on the peg. In this talk this remarkable phenomenology will be demonstrated and its theoretical understanding, based on classical mechanics, will be discussed. This theory has a long history (since the 19th century); recent progress will be reported (including computer simulations). This talk should be of interest for the entire physics community, including undergraduate and graduate students.</p> <p>AULA CONVERSI ORE 16.00 SEMINARIO TEORICO</p> <p><i>Roberto Bonciani</i></p>	<p>AULA CARERI ORE 11.00 SEMINARIO DI FISICA STATISTICA</p> <p>Statistical Physics of Active Matter</p> <p><i>Julien Tailleur</i> <i>(CNRS - Laboratoire MSC - Univ. Paris Diderot)</i></p> <p>Over the past few years, there has been a growing interest among physicists for 'active systems', in which energy is taken from the environment to produce self-propulsion at the single particle level. Active particles, such as bacteria, self-diffusiophoretic colloids or actin filaments in motility assays, are thus strongly out-of-equilibrium and exhibit much richer behaviors than their passive counterpart. In this talk I will review recent theoretical progresses regarding the steady-state distribution of active particles and discuss various mechanisms of pattern formation that have no counterpart in equilibrium systems.</p>