

## WEEKLY CALENDAR

October 24, 2011

### Departmental Colloquium

Thursday, 3:40 PM, October 27, 2011  
109 Nicholson Hall

**"Life and Evolution of the Universe"**

Juan Pérez-Mercader  
Harvard University

*Host: Richard Haymaker*

• Refreshments served at 3:15 PM in 232 (Library) Nicholson Hall •

During the last decades we have put together a picture of the Evolution of the Universe where on the basis of a few basic principles we understand how it has changed through its history and evolved into the morphologies we observe today: we even have sets of equations that encapsulate the above. In addition we know that chemical evolution takes place in the Interstellar Medium, and are beginning to understand many details of the formation of planetary systems and their planets. During this period we have also developed a deep understanding of the Co-Evolution of Life in our planet and understood an extraordinary number of the many features and properties of extant and extinct living systems. Biology today is still a lot about detail, and our understanding of Life and Living Systems is still far from the more simplicity-based that we have for the Universe. Notwithstanding this, efforts are on their way to build a Bridge Between the Big-bang and Biology in order to pin down the accidental from the regular in Biology. This involves observational, experimental and phenomenological work in areas such as Interstellar Chemistry, Planetary Exploration, Origin of Life, Evolution of Life, Genomics, Synthetic Life or the Search for Life beyond the Earth. In this talk we will give a brief review of this exciting area and discuss some selected contributions coming from Physics and Information Theory.

### Special Seminar

Thursday, 1:30 PM, October 27, 2011  
435 Nicholson Hall

**"Semiconductor Nanowires: quantum structures for optical studies and applications"**

**Kuntheak Kheng**

Nanophysics and Semiconductors Group  
INAC and Institut NEEL, CEA/CNRS/University Joseph Fourier at Grenoble  
Grenoble, France

*Host: Juana Moreno*

Semiconductor nanowires are appealing nano-objects that allows designing quantum structures with unprecedented freedom. With nanowires, new type of quantum dots can be directly grown on defined positions without the necessity of self-assembly, as well as more complex core-shell structures. Our group develops in particular the growth of GaN/AlN and CdSe/ZnSe nanowire heterostructures. In this talk, I will give a short overview of activities running in our group Nanophysics and Semiconductors at Grenoble, and then a more detailed presentation about works on growth and optical study of nanowire heterostructures. In particular the development of CdSe quantum dots inserted in ZnSe nanowires has allowed us to show single-photons generation at room temperature (for the first time for an epitaxial quantum dot).

### Publications:

1. "Polypyrrole-Titania Nanocomposites Derived from Different Oxidants", Suying Wei, Pallavi Mavinakuli, Qiang Wang, Daniel Chen, Ramesh Asapu, Yuanbing Mao, **Neel Haldolaarachchige**, **David P. Young**, and Zhanhu Guo, *Journal of The Electrochemical Society*, **158** (11) K205-K212 (2011).
2. "Consistency of a causal theory of radiative reaction with the optical theorem", F. Intravaia, R. Behunin, P.W. Milonni, G.W. Ford and **R.F. O'Connell**, *Physical Review A* **84**, 035801 (2011).