



ERC Starting Grants to Hugues de Riedmatten and Morgan Mitchell

The grants fund projects in quantum light matter interfaces and quantum metrology.

September 18, 2011

Two ICFO group leaders were awarded by the European Research Center with a Starting Grant this year.

ICREA Prof. Hugues de Riedmatten has been granted to pursue his project **Ensemble based advanced Quantum Light Matter Interfaces**. The goal of the project is to develop a new generation of photonic quantum memories with enhanced storage properties and embedded quantum processing capabilities. Two physical systems will be investigated in the project: laser cooled Rubidium atoms and solid state atomic ensembles based on rare-earth doped solids. The memories will then be used to explore new avenues in the quantum control of matter-matter entanglement.

ICREA Prof. Morgan Mitchell's awarded project is **Atomic Quantum Metrology**. Atomic instruments such as atomic clocks, atomic gravimeters, and atomic magnetometers are the most sensitive instruments for measurements of time, gravity, and magnetic fields. Quantum optical effects such as entanglement and squeezing can improve the sensitivity of these instruments, allowing them to detect tiny signals that would otherwise be buried in quantum mechanical noise. The project will apply state-of-the-art quantum optical techniques, many of them developed at ICFO, to optical magnetometry using ultra-cold atoms. Revolutionary new proposals for quantum metrology will be tested, including interaction-based measurements and quantum compressed sensing.

Congratulations to you both!



Prof. Morgan Mitchell

