

CEA - Saclay 91191 Gif-sur-yvette Cedex  
Service de Physique de l'Etat Condensé  
**SÉMINAIRE**

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**Mercredi 27 avril 11h15**

**Orme des Merisiers SPEC Salle Itzykson, Bât.774**

**Quantum measurement and coherence protection of single spins in diamond**

**Ronald Hanson**

Kavli Institute of Nanoscience,

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Quantum control of light and matter is an outstanding challenge in modern science. Diamond-based materials have recently emerged as a unique platform for quantum science and engineering. Spins of single Nitrogen-Vacancy (N-V) color centers in diamond can be imaged, initialized and read out optically, and show quantum coherence even at room temperature. Full control over the spin state and the optical transition may enable exciting applications such as long-distance quantum teleportation and quantum information processing. Moreover, the tunable interactions of the NV center with its environment also make this system an excellent test bed for fundamental studies on decoherence, spin-bath interactions, and light-matter interactions in engineered nanostructures.

In this talk I will present our recent results on schemes to protect spin coherence from the surrounding spin bath as well as quantum control of the spin bath itself. Also, I will discuss our latest results on single-shot measurement of both electron and nuclear spins, and progress towards entanglement of distant NV center spins via photon interference.

A coffee break will be served at 11h00. The seminar will be given in English.

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