



## Séminaire Invité

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**Lundi 20 février - 10H30**

Amphi Faure



10h00

### **Probing the short time dynamics of a nuclear spin bath with spin qubits**

Spin qubits in semiconductor gate defined quantum dots offer a good platform to manipulate quantum information in a scalable architecture. In these circuits, single or coupled electron spins are used as qubits for quantum information encoding and manipulation. One major hindrance for the realization of practical devices was the presence of nuclear spins in the host material which generate a fluctuating magnetic field inducing a fast dephasing of the electron spin. A great effort has been made to successfully address this issue in the past years. However, one can also use the fast and sensitive technology of spin qubits to probe the dynamics of this nuclear spin bath.

In the first part of this seminar, I will introduce how electron spins are manipulated in multiple spin qubits devices and present the implementation of a triple spin qubits device [1]. In the second part, I will discuss how we can use a qubit to access the short time dynamics of its surrounding nuclear spin bath [2]. At these timescales, we observed a surprising sub-diffusive behavior of the nuclear spin bath.

[1] T. Nakajima et al., arXiv:1604.02232 (2016)

[2] M.R. Delbecq et al., Phys. Rev. Lett. 116, 046802 (2016).