



CEA – Saclay, 91191 Gif-sur-Yvette Cedex  
Service de Physique de l'Etat Condensé - UMR 3680

## SÉMINAIRE

Mercredi 22 novembre 2017 à 11h15

Orme des Merisiers SPEC, Salle Itzykson, Bât.774

**Toeno VAN DER SAR**

*Technical University Delft, The Netherlands*

### **Exploring condensed-matter physics using single-spin magnetometry**

The magnetic fields generated by spins and currents provide a unique window into condensed-matter physics. Proposed only a decade ago, magnetometry based on the electron spin of the nitrogen-vacancy (NV) defect in diamond is emerging as a platform that is excellently suited for probing condensed-matter systems: it is operable from cryogenic to above room temperature, has a dynamic range of DC to GHz, and allows sensor-sample distances down to a few nanometers. As such, NV magnetometry provides nanoscale access to the physics of systems ranging from paramagnetic spin baths to correlated-spin materials. In this talk, I will introduce the basic concepts of NV magnetometry, highlight milestone results such as room-temperature imaging of a single electron spin, and describe recent developments in applying NV magnetometry to study spin dynamics in ferromagnets [1,2].

[1] - T. van der Sar\*, F. Casola\*, et al., *Nanometre-scale probing of spin waves using single electron spins. Nat. Commun.* 6, 7886 (2015).

[2] - C. Du\*, T. van der Sar\*, T. Zhou\*, et al., *Control and local measurement of the spin chemical potential in a magnetic insulator. Science* 357, 196 (2017).

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