

## **UE de communication et approfondissement thématique**

**Sujet** : Cavity cooling of nanoparticles : prospects for the nano-metrology

**Encadrant** : Guellati Saida, [saida.guellati@lkb.upmc.fr](mailto:saida.guellati@lkb.upmc.fr)

**Lieu** : Laboratoire Kastler Brossel

**Descriptif** : In 2013, the cavity cooling of free silicon nanoparticles in high vacuum has been demonstrated by the group of Markus Arndt at the university of Vienna (P. Asenbaum, S. Kuhn, S. Nimmrichter, U. Sezer, and M. Arndt, *Nature Communication* 4, 2743 (2013)).

Off-resonant laser fields in high-finesse cavities circumvent the lack of internal cycling transitions of dielectric objects and provides assistance in the cooling of their centre-of-mass. The student should present the principle of this experiment and related results. He or she will investigate the interest of the laser cooling of nanoparticle to implement a new metrology experiments to measure properties of complex nanoparticles.