

PHOTONICS - EUROPHOTONICS MASTER COURSE

MASTER THESIS PROPOSAL

Course 2014 –2015

Laboratory: ICFO- The institute of Photonic Sciences
City, Country: Barcelona

Title of the master thesis: Quantum optomechanics based on levitating NV centers

Name and affiliation of the tutor of the master thesis:

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Summary of the subject (maximum 1 page):

Nitrogen vacancy (NV) centres in diamond are promising elemental blocks for quantum optics, spin-based quantum information processing and high-resolution sensing. In practise though, many of these applications require properly isolating the NDs from its environment in order to avoid perturbations or to conserve quantum coherence. Levitation in high vacuum is a versatile solution, since it allows avoiding most of the thermal and mechanical perturbations without the need of cryogenic cooling.

In this experimental project, the student will contribute to the development of a setup where single NDs are trapped in high vacuum and their dynamics monitored through the NV fluorescence. The main task of this master project is to implement the optical scheme used to excite and detect the NV fluorescence. The student will also be involved in the operation and control of the trapping set-up and will team up with PhD students and postdocs in the host group.

Keywords: Nitrogen vacancies (NV), single quantum emitters, optomechanics

Additional information:

- * Amount of the monthly allowance (if it is the case):
- * Required skills: Experience working with lasers in an optics lab
- * Miscellaneous: