

QUILMI

Mon, 2012-11-26 11:28 - [Lukas Theussl](#) **Full Name:** Quantum Integrated Light Matter Interface
Coordinator: Igor Lesanovsky

Location

University of Nottingham Nottingham United Kingdom
52° 57' 17.2188" N, 1° 9' 29.106" W
See map: [Google Maps](#)

Website:

<http://www.quilmi.eu/>

Running time: 2012-10-01 - 2015-09-30

This project brings together an interdisciplinary team of young, ambitious and internationally recognized researchers. The aim of the proposed research is to create a highly integrated device, which permits to manipulate, store and control light on a single-photon level using tailored quantum matter. Specifically, we will implement a three-dimensional optical lattice on an atom chip together with sophisticated waveguides for single-photon manipulation and detection, all integrated on the very same chip. Our vision is that this device becomes the centrepiece of novel hybrid light-matter networks, with which quantum information processing can be approached from a highly modularized standpoint.

Our objective is to develop a far-reaching theoretical framework for light-matter interaction on an atom chip and to conduct experiments that, for the first time, demonstrate both coherent light-matter coupling and single-photon detection in an integrated device. This proof-of-principle demonstration will push quantum technology and methods beyond the current state-of-the-art. To achieve this ambitious goal we will exploit the combined expertise of our team in theoretical and experimental quantum optics, atomic physics and many-body physics. The proposed project promises high benefit for the European Research Area, as its prospective achievements will advance applications in quantum technology, and strongly enhance the competitive edge of European Research. The envisioned program will promote young researchers from different European countries and will allow them to forge a new international research alliance. This contributes to the exploitation of synergies in the European science scene, thereby building and securing leadership of Europe in ICT research.

- [EC - FP7](#)
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