



## Four PhD and postdoc positions in the cold-atom group in Nice (France)

The cold-atom group is led by Robin Kaiser at [Institut de Physique de Nice](#), a lab from [Université Côte d'Azur](#), one of the top research Universities in France (Excellence label).

The group has currently 16 people and runs four cold-atom experiments, see the webpage: <https://inphyni.cnrs.fr/sites/teams/cold-atoms/>

It has currently four open positions on three of the experiments. All positions will stay open until filled. Please contact the person in charge of the project you are interested in.

### Ytterbium experiment (postdoc and PhD)

In the framework of the ERC project ANDLICA, we are building a new Ytterbium experiment. The goal of this experiment is to study **Anderson localization of light** by cold atoms.

We are seeking an experimental PhD and a theoretical postdoc. The experimental PhD will join the team of the current 2 PhD students and will be in charge of the experimental implementation of this project. For this position, we are looking for someone with advanced experimental skills and motivation, ideally with a first experience in cold atom experiments. The theory postdoc will be in charge of identifying suitable experimental protocols via numerical and analytical modeling of the experiment. We are looking for candidates with a prior expertise on numerical simulations and light propagation in disordered systems. The candidate needs to have acquired maturity in the choice of theoretical tools to be used and have a prior expertise in collaborating with experimental groups.

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### Rubidium 1 Experiment (postdoc)

In the framework of the QuaCor project, funded by the ANR as an international France-Brazil collaboration, we are probing **classical and quantum correlations** in a cold atomic cloud thanks to intensity correlations. The main scientific objective of this project is to **explore a new kind of correlated photon source based on a multi-atom disordered ensemble**. This source of correlated or heralded

photons will be based on the correlations inside the **Mollow triplet**, on the light inelastically scattered by a cold atomic cloud. Taking advantage of the large number of emitters ( $10^8$  to  $10^9$  atoms), this could pave the way to the generation of **intense beams of correlated photons**. Such quantum correlations are usually observed on single emitters (atom, ion, quantum dot, etc) and are hidden when the number of emitters is increased. The main barrier to be lifted will be to find an experimental configuration which will enable detecting **quantum correlations** between the photons scattered by a **multi-atom source**.

We are seeking an experimental postdoc. He will join the team of the current 2 PhD students and will supervise the experiment. For this position, we are looking for someone with a strong expertise in cold atom experiments, ideally with an expertise in quantum optics and experimental tools to probe quantum correlations. This position will be mainly experimental but numerical studies could be also possible, and the postdoc should be able to discuss with theoreticians to investigate new possible experimental configurations to probe quantum effects in multi-atom ensemble.

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### Rubidium 2 Experiment (postdoc or PhD)

In the framework of the [PACE-IN](#) European project, we want to pursue experiments on collective effects on light-atom interactions using cold atoms trapped in a 1D optical lattice. The atomic periodicity gives rise to a **photonic band gap**. We want to study the rich physics associated to this band gap (modification of the spontaneous emission rate, slow light, etc.) and devise protocols to use it for quantum manipulation of light, for instance as a quantum all-optical switch (using electromagnetically-induced transparency).

For this project we are seeking a motivated experimentalist with a prior experience in laser/atomic physics experiments, ideally with cold atoms. This can be either a PhD student or a postdoctoral researcher. The candidate will work in team with another PhD student already working on this project. If at the postdoc level, he/she will contribute to his supervision.

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