

INTERNSHIP PROPOSAL

(One page maximum)

Laboratory name: Institut UTINAM
CNRS identification code: UMR 6213
Internship director's surname: Lages
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Web page: <https://perso.utinam.cnrs.fr/~lages/>
Internship location: Observatoire de Besançon, Université de Franche-Comté, Besançon

Thesis possibility after internship: YES
Funding: YES If YES, which type of funding: QuanTEdu

PhD and Master internship positions on Quantum Information Theory

More information at: https://perso.utinam.cnrs.fr/~lages/phd/NewPhD_proposal_QuanTEdu.pdf

In the frame of the QuanTEdu-France project, the Theoretical Physics group at UTINAM <https://www.utinam.cnrs.fr>, University of Franche-Comté (UFC), France, is seeking for brilliant and motivated Master and PhD student.

What are you going to do? This is a full-time position to work on “*Quantum information, decoherence, dissipation, and interacting qubits.*” As crucial as Huygens' discovery in 1665 of clock synchronization was for military and maritime navigation, understanding the phenomenon of quantum synchronization of superconducting qubits should potentially open the way to important novel applications in quantum technology.

What do we offer? The position has a fixed term of three years and will start around **October 2025**. It leads to a PhD with a final defense. The net salary (after taxes) will be around 2100€ depending on housing help eligibility and possible, but not mandatory, teaching duties. You will benefit from a series of multidisciplinary courses taught at the UFC doctoral school. An annual budget for attending conferences and workshops is also planned.

For candidates who could join us a few months earlier this **Spring 2025**, a Master internship (pre-PhD internship) is also available which can begin as soon as possible. The Master internship can be of two to six month duration with a gratification of about 640€ per month (no tax, with possible housing at the Besançon Observatory). By mutual agreement, the candidate will then pursue with the funded PhD position.

Two axis of research are developed in the Theoretical Physics group, “*Complex Networks, Chaos and non-linearity*” and “*Open Quantum Systems and Quantum Information.*” The group belongs to UTINAM, a multidisciplinary laboratory of the University of Franche-Comté and CNRS, gathering theoretical physicists, molecular physicist and chemists, and astrophysicists. We are located at the Besançon Observatory <https://theta.obs-besancon.fr> in the University of Franche-Comté. Besançon is a beautiful French city surrounded by nature <https://www.besancon-tourisme.com/en/> close to the Jura Mountains and the Switzerland border. The city is two hours from Paris by train.

With the candidate, we will also collaborate closely with the Laboratoire de Physique des Solides <https://www.lps.u-psud.fr>, Paris-Saclay University, and the Quantware group <https://www.quantware.ups-tlse.fr> in the Theoretical Physics Laboratory <https://www.lpt.ups-tlse.fr>, Paul Sabatier University, Toulouse.

Your skills - a Master degree (or equivalent) in Physics or related fields, - good knowledge in quantum physics, - prior experience in numerical methods programming.

You will: - perform theoretical research on quantum physics devoted to applications in quantum technology, - disseminate his research results in international workshops and conferences and participate in writing drafts for submission in peer-reviewed journals, - participate in the scientific events organized by the QuanTEdu-France consortium, - possibly, teach at the department of physics (non mandatory).

The application will consist in only one pdf document containing: - a motivation letter, - a detailed curriculum vitae, - certified grades for the three last academic years, - names and email addresses of two references.

Please submit your application (a pdf document, any other file type will not be considered) to the following cloud:

<https://sdrive.cnrs.fr/s/k2tcjAybmNe39Ed>

Evaluation of applications will begin immediately.

Please, indicate which speciality(ies) seem(s) to be more adapted to the subject:

Condensed Matter Physics: YES Soft Matter and Biological Physics: NO
Quantum Physics: YES Theoretical Physics: YES