



PhD Position

From trapped bulk-acoustic-wave cavities to optomechanics

With its 7 departments the FEMTO-ST Institute, Besançon, France is a multi-physics exciting environment of about 700 people, located in a dynamic city, in the exceptional open nature landscapes of the Franche-Comté region.

A doctoral position is available from October 2017 up to September 2020 in the Time and Frequency department of the Institute. The position is funded by the French Ministry of Research and Education to pursue and reinforce recent investigations on bulk acoustic wave resonators at cryogenic temperature (typically 4 Kelvins). In such operating conditions their unique properties open up new applications in different fields starting from ultra-stable oscillators to hybrid quantum systems. For all these areas of research, new low-loss devices can play a game changing role.

Exchanges already exist on this topic with Prof. M. Tobar's group at the University of Western Australia (UWA) Perth, and the team Optomechanics and Quantum Measurements from Laboratoire Kastler Brossel, Paris.

The successful candidate will be involved in cutting edge physics experiments based on optomechanics, when designing a cryogenic oscillator. As an example, such very low-loss acoustic cavities can be merged with optical cavities to be optically excited. Beyond the proof of concept presently in progress, various options for the optical cavity could be considered, as well as for the displacement readout (by means of optics and/or piezoelectricity...). In addition, the thermal behaviour will obviously be taken into account, the thermal excitation being also a good candidate at cryogenic temperatures.

Consequently, we are looking for a young scientist highly motivated by physics measurements and experiments involving optoelectronics among others. Particularly relevant skills can include a background in Physics, Electronic, Mechanical Engineering, and Optics.

Knowledge of French language would be appreciated but is not required. Nevertheless a good level in spoken and written English is obviously mandatory.

Key words: acoustic cavity, bulk acoustic waves, optical cavity, optomechanics, oscillators.

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