Open research positions in the Laboratory of Wave Engineering at Ecole Polytechnique Fédérale de Lausanne (EPFL)

The Laboratory of Wave Engineering at EPFL in Lausanne, Switzerland, has new open positions for several doctoral students. We can also offer paid research internships in Spring or Summer of 2019, with a strong preference for prospective Ph.D. students, which may be offered the possibility to come and experience working with us prior to committing to a Ph.D.

You will find a brief description below, as well as other related information.

Please send your CV at romain.fleury@epfl.ch together with a brief motivation letter if you want to apply or know more about the positions or work conditions and environment.

More info about our research can be found on our web site at https://lwe.epfl.ch

Ph.D. student positions

1) Open Ph.D. position in the field of active acoustic metamaterials

Summary: Acoustic metamaterials are synthetic acoustic materials that exhibit properties that cannot be found in natural materials. These artificially structured passive media are typically associated with extraordinary acoustic phenomena, including subwavelength sound manipulation and focusing, negative refraction, or cloaking effects. To date, however, their practical applications are limited due to their typical narrowband behavior and sensitivity to absorption losses. This fully-funded Ph.D. thesis aims at solving this issue by exploiting the unique physics of active metamaterials, in which the interplay between gain, loss, and the coupling between local acoustic resonances can enable novel phenomena without stringent bandwidth restrictions or detrimental sensitivity to dissipation. We offer a very competitive salary and unique work environment.

Start date: Around September 1st, 2019.

Ideal profile: Engineering Diploma with a strong interest for physics, MS in physics, or Physical Acoustics. Experience in research and experimental work, scientific rigor. Good English level. Excellent academic profile.

2) Open Ph.D. position in the field of room-temperature microwave emitters

Summary: Lasing at microwave frequencies, or masing, is challenging at room-temperature due to the fact that the corresponding energies fall below the average thermal energy. Some recent works, however, have demonstrated room-temperature masing from pentacene-doped p-terphenyl organic crystals, exploiting spin-selective inter-system crossing and internal transitions, yet the required pump intensities are still relatively high. This fully-funded Ph.D. position aims at studying the possibility to engineer the environment of microwave quantum emitters to boost the Purcell effect and drive the pump intensities down to battery levels. The project will consist of 60% experimental work, and 40% theoretical work (numerical calculations, models). We offer a very competitive salary and unique work environment.

Start date: Around September 1st, 2019.

Ideal profile: Engineering Diploma with a strong interest for physics (for instance ESPCI, X, Ecole Centrale, IOGS, etc), MS in physics (Magistère de Physique Fondamentale) with appropriate courses. Taste for both theory and experiments. Experience in research, scientific rigor. Good English level. Excellent academic profile. Knowledge of French is a plus.


3) Two Open Ph.D. position in the field of imaging using metamaterials combined with advanced signal processing techniques (compressed sensing, machine learning strategies, etc)

Summary: Metamaterials have been widely used for their ability to image objects at the subwavelength scale or in multiple scattering environments. These two fully-funded Ph.D. thesis will explore both theoretically and experimentally the possibility to combine the unique advantages of metamaterials with advanced signal processing techniques, such as compressed sensing, machine learning, etc. One Ph.D. thesis will be devoted to microwaves, and the other to acoustics/ultrasounds. A third position may be available for a student with appropriate profile to perform a similar type of research in the field of TeraHertz imaging. We offer a very competitive salary and unique work environment.

Start date: Around September 1st, 2020.

Ideal profile: Engineering Diploma or MS. Interest in Engineering and Mathematics. Taste for both theory and experiments. Experience in research, scientific rigor. Good English level. Excellent academic profile.