

# PhD Thesis on Experimental Aero-Acoustics for Liners

Laboratoire d'Acoustique de l'Université du Mans (LAUM)  
Le Mans, France

Applications are invited for a PhD scholarship to work on acoustic treatments with applications to aircraft engines at the LAUM (Laboratoire d'Acoustique de l'Université du Mans).

Acoustic treatments are widely used on turbofan engines to absorb sound before it can propagate out of the engine. There is an urgent need to improve these treatments to further reduce noise emissions from future engine architectures. One challenge is the design of treatments for the core of the engine. In this region, the air flow reaches high speeds and high temperatures (in excess of 700°C). In particular special materials must be used to operate at these temperatures, strongly restricting the choice of designs for these acoustic treatments.

This PhD project aims to explore the physics and design of acoustic treatments in the presence of hot flows. The emphasis will be placed on experimental techniques to better understand the interactions between the sound field, the flow and the acoustic treatment. This will rely for instance on optical methods to measure the details of the flow features over a liner.

*Context:* Noise emission remains one the main challenges for the development of commercial aviation. For the next generation of aircraft engines to be quieter and more fuel efficient, the performance of acoustics absorbers installed on these engines must be optimised. This PhD project is part of the project CIRRUS that is funded by the European program CleanSky 2. With the support of the Safran group, this project aims to develop novel acoustic treatments, as well as modelling methods and experimental tools, for the noise radiated from turbofan engine exhaust. This is a partnership between the LAUM, Vibratex, CERFACS, MSc FFT and PSA3. The project will involve close collaborations with researchers and engineers from these institutions, as well as participations in national and international scientific conferences. The LAUM is one of the largest research labs in acoustics and hosts a large number of researchers and projects working on acoustic treatments, including several specialised experimental facilities.

*Profile:* Applicants should have a Master's degree (or equivalent qualification) in acoustics or fluid mechanics. A keen interest in experimental techniques is recommended. We look for highly motivated applicants with excellent interpersonal, written and oral communication skills.

*Duration:* 36 months.

*Expected start date:* Autumn 2020.

*Funding:* Minimum annual gross salary: 21223€.

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