



## LABORATOIRE D'ACOUSTIQUE DE L'UNIVERSITÉ DU MANS (LAUM) - UMR CNRS 6613 LABORATORY OF ACOUSTICS OF LE MANS UNIVERSITÉ (LAUM) - UMR CNRS 6613

Acoustics is the science of sounds. Acoustics is related to the production, transmission and reception of sound as well as its effects on living beings, the environment and matter. Acoustics is an integral part of the engineering and environmental sciences, health and life sciences as well as humanities and social sciences.

Investigations at the Acoustics Laboratory in Le Mans Université mainly focus on sources and sensors, acoustics and mechanics of materials, wave propagation in fluids and complex structures. Acoustic investigations aim at observing and quantifying physical phenomena, at analysing and modelling them using both mathematical and numerical methods. Applications cover a wide field of subject topics: noise reduction and vibration damping, evaluation and control of materials, sound quality...

The sectors of activity related to acoustics exhibit a large diversity: building, automotive, aeronautics, telecommunications, music and instrument making, entertainment industry, environment, medicine, etc.



### 150 people including

60 researchers and teachers-researchers

70 students and postdoctoral fellows

20 administrative and technical staff



### Partnerships

LAUM actively cooperates with French, European (Great Britain, Spain, Sweden, Czech Republic, etc.) and International (USA, Canada, China, Brazil, Japan, etc.) laboratories. LAUM has also developed industrial partnerships with the Le Mans Centre for Technology Transfer (CTTM), SAFRAN, SNCF, Renault, PSA, Valéo, Orange Labs, etc.



Specific rooms equipped with test benches, **anechoic and semi-anechoic rooms**, optoacoustics and digital holography rooms, microtechnology room (clean room), etc.

Partner of Le Mans Acoustique Institute and member of the Institut d'Acoustique - Graduate School (PIA3 - ANR program).

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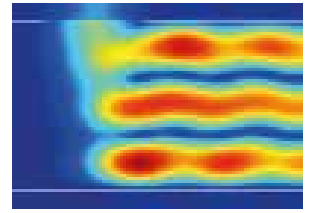


## 3 research groups

### Materials group

This research group carries out investigations on acoustic propagation in complex environments (metamaterials, phononic crystals, granular, inhomogeneous, non-linear or porous materials, etc.). The work carried out addresses several fundamental aspects: wave-material interactions (non-linear acoustics, study of energy transfers, coupling, damage, wave control, inverse problem solving, signal processing, etc.).

This work also extends to applications such as the identification of properties, imaging, implementation of diagnostic tools, sound absorption, wave control, non-destructive evaluation and inspection).



### Transducer group

This group is involved concerned with transducers (sensors, actuators, energy converters), the development of test benches (digital holography, 3D vision, metrology) and related signal and image processing. The studies carried out, both theoretical and experimental, are supported by sharing fundamental skills from the members of the group (acoustic, thermal, optics, magnetism, electrical engineering, signal processing, etc.) and their technological expertise (fine measurements, micro-manufacturing in a clean room environment).



### Waveguides and Structures group

This research group aims at investigating the propagation of waves in complex media in the entire range of audible frequencies. The research focuses on problems related to acoustic comfort, improvement of the sound environment and musical acoustics. The group carries out analysis of radiated sound from sound sources, whether desired (instrument manufacture) or not (aeronautics, radiation from vibrating structures, etc.), and propagation (urban acoustics, wave control in structured environments). Research works are carried out both from a fundamental point of view (analytical approaches and development of numerical methods) and an experimental approach (development of measurement and simulation systems).



## 11 research sub-topics and 2 cross-disciplinary axes

