Researchers and technicians: N. COTÉ, B. DUBUS, C. GRANGER, A.C. HLADKY, P. MOSBAH, J. VASSEUR
PhD students: E. ATTAL, S. DEGRAEVE, S. A. MANSOURA, R. ROUFFAUD, P. MERESSE

Acoustics group develops research based on its expertise on phononic crystals and metamaterials, transduction and numerical methods, with the following main results:

**PHONONIC CRYSTALS: NEGATIVE REFRACTION**

Metallic structure that exhibits an excellent index matching with water
- Focusing of acoustic waves with a resolution close to the diffraction limit
- Applications as field copier

**PHONONIC CRYSTALS: TUNABILITY**

Piezoelectric phononic crystals: electric charge band gap induced by free electric charges on the electrodes
- The band gap is highly tunable by using electrical capacitances
- Development of tunable and reconfigurable active phononic crystals and metamaterials

**PHONONIC CRYSTALS: COLLIMATION**

Square array of steel rods in epoxy
- Plane wave of specific frequency at oblique incidence (numerical simulations)
- Self-collimation of the phonon flux inside the phononic crystal
- Application to thermal conductivity management of nanostructured devices, directional sources, acoustic logic gates

**RF MEMS**

Guided Acoustic Wave (GAW) RF piezoelectric resonator atop of Bragg mirror
- Different frequencies (determined by resonator width) on the same chip
- Co-integration with BAW resonator providing simultaneously wide band (BAW) and narrow band (GAW) RF filtering

**PARTICIPATION TO ANR PROJECTS:**

As coordinator:
- SUPREME (ANR blanc 2009-2011)
- MIRAGES (ANR blanc 2013-2015)

As participant:
- OVMI (ANR jeune chercheur 2006-2008)
- EVA (ANR contenu et interaction 2009-2013)
- HYPERCAMPUS (ANR matériaux et procédés 2011-2013)