

Post-doctorate at ENSTA Paris



Research : Acoustic metamaterials

We are interested in the propagation of sound in bubbly media exhibiting resonances due to the strong density contrast between air and water (Minnaert resonances). Different configurations are envisaged, ranging from bubbles distributed in a large volume or concentrated on a plane. The objective is to develop effective models capable of reproducing the scattering properties of these resonant "metamaterials". We will rely on multiscale homogenization methods, the results of which are compared with full-scale simulations and experimental results.

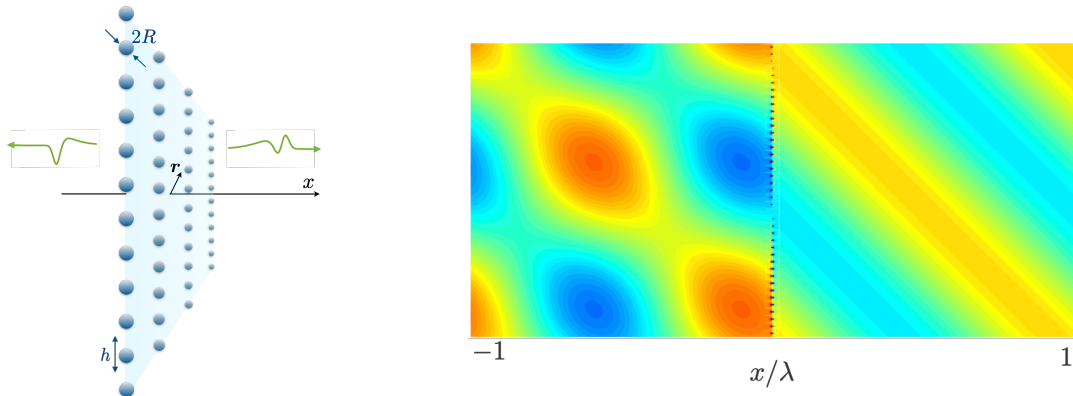
Depending on the taste of the candidate, the project may focus on different physical aspects: effects of non-linearities, the distribution of bubbles, influence of the presence of a viscoelastic matrix (anechoic tiles).

This project involves a collaboration between IMSIA (ENSTA Paris) and the Langevin Institute (ESPCI).

Profile : The candidate should be skilled in theoretical analysis and/or numerical simulation.

Position : 1 year postdoc with possible extension for 1 year, starting from October 2020 or later.

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Bibliography :

- Pham K. et al. *Scattering of acoustic waves by a non-linear resonant bubbly screen. To appear in J. Fluid Mech.*, 2020.
- Maurel A. et al. *Enhanced resonance of sparse arrays of Helmholtz resonators - Application to perfect absorption. J. Acous. Soc. Am.*, 145, 2552, 2019.
- Pham K. et al. *Two scale homogenization of a row of locally resonant inclusions - the case of anti-plane shear waves. J. Mech. Phys. Solids*, 106, 80–94, 2017.