



Soutenance de thèse

Mercredi 31 mars

12h00

Centre de Nanosciences et de Nanotechnologies
10 boulevard Thomas Gobert
91120 Palaiseau
Amphithéâtre

Omar ORTIZ

“ Coherent acoustic-phonon dynamics in GaAs/AlAs heterostructures ”

Lien public : <https://us02web.zoom.us/j/85202959302>

Jury members :

Andrea Bragas, Universidad de Buenos Aires, Rapportrice
Sebastian Volz, LIMMS - University of Tokyo, Rapporteur
Juan Ariel Levenson, C2N/CNRS, Examineur
Anthony Kent, University of Nottingham, Examineur
Samuel Raetz, LAUM - Le Mans Université, Examineur
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Abstract :

Phonons are quasi-particles relatively unexploited for application purposes, in comparison with electrons and photons. GaAs/AlAs heterostructures like superlattices have been established as a platform that allows engineering the propagation and confinement of acoustic phonons in nanostructures. In this work, we introduce novel devices that control the propagation of acoustic waves and, furthermore, allow us to study and mimic solid-state physical phenomena of different nature. Superlattices also offer the possibility to enhance the transduction of acoustic phonons into optical signals. Nowadays, there exists a demand for novel techniques that facilitate the experimental study of nanophononic devices. In the course of this thesis, we have experimentally studied nanoengineered GaAs/AlAs heterostructures that control the propagation of coherent acoustic phonons in the tens to hundreds of gigahertz range. We develop novel experimental techniques based on the use of single-mode fibers and pump-probe spectroscopy that allow us to identify the presence of coherent phonons with unprecedented robustness and reproducibility.