

# SEMPARIS – Séminaires en région parisienne

<http://string.lpthe.jussieu.fr/semParis/>

## Séminaire de matrices, cordes et géométries aléatoires

**Mercredi 15 Novembre 2017, 14 :15**  
IPHT, Salle Claude Itzykson, Bât. 774  
Domaines : hep-th

Titre : *Phonons in holographic superfluids and solids*

Orateur : **Sebastian Garcia-Saenz ( Institut d’Astrophysique de Paris )**

Résumé : *After reviewing the gravitational dual of superfluids in the context of AdS/CFT, I will describe an analytical method to derive the low-energy spectrum of the boundary theory. The result confirms that, at zero temperature, the effective theory consists of a longitudinal phonon with the correct speed of sound. I will next move on to consider the EFT of solids and use it to motivate the construction of a holographic dual. Here too we are able to derive the correct low-energy effective theory of the phonons in a conformally invariant solid. Lastly we obtain some numerical solutions including backreaction and calculate the free energy, finding evidence that the system “melts” into a black hole as the temperature is raised, which we interpret as a solid-to-liquid phase transition on the field theory side.*

---