

# The spectral gap of some models of random hyperbolic surfaces

**Speaker:** Davide Macera - University of Bonn

**Time:** Wednesday April 08, 13:00-14:00

**Location:** Room B308, Largo S. Murialdo 1 (Roma)

In this talk, I will introduce two models of random (smooth) hyperbolic surfaces, namely the **random cover model** and the **Weil-Petersson model**. I will then focus on the Laplace–Beltrami operator on random compact surfaces of genus  $g$  sampled with these models and discuss two recent results stating that such operator has no eigenvalues below  $1/4 - g^{-c}$  as  $g$  grows large. These results, and the study of the spectrum of random hyperbolic surfaces in general, are motivated by some open questions from the theory of quantum chaos that I will discuss as well. The proofs make use of the notion of **strong convergence** for random operators and of the **polynomial method**, recently introduced by Chen, Garza-Vargas, Tropp and Van Handel. In the Weil-Petersson case, this gives a simpler proof of a stronger version of a celebrated recent result by Anantharaman and Monk. Based on a joint work with Joe Thomas and Will Hide.