Boundary-adapted arithmetic random waves and spectral semi-correlations

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In this talk, I will discuss recent progress on a class of "tricky" problems concerning additive properties of integral points belonging to the circles. I will focus on spectral applications testing M. Berry's ansatz on nodal deficiency in presence of boundary. The square billiard is studied, where the high spectral degeneracies allow for the introduction of a Gaussian ensemble of random Laplace eigenfunctions. I will discuss the asymptotic analysis of the nodal length slightly above the Planck scale.

This is based on joint works with V. Cammarota and I. Wigman, and A. Sartori.