

Members Seminar

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A Tricky Problem on Sums of Two Squares

Series: Members Seminar

Enrico Bombieri

Professor Emeritus, School of Mathematics, IAS

Date & Time: Mon, 12/10/2012 - 14:00 - 15:00

Location: S-101

Video Link:

<http://video.ias.edu/members/2012/1210-bombieri>

A 'toy model' for studying the probabilistic distribution of nodal curves of eigenfunctions of linear operators arises from the Laplacian on the standard real 2-torus. Here the eigenvalues are associated to integers m that are sum of two squares, with multiplicity equal to the number of such representations. When the number of representations increases to infinity, it makes sense to consider the associated random eigenfunctions. The calculation of the variance is crucial and leads to the problem which is the object of this talk. There are a trivial upper bound and a still unproven precise conjecture for the size of the variance. The lecture presents the partial but still useful results obtained jointly with Jean Bourgain by attacking the question with: sum-product theorems for discrete sets, combinatorics, diophantine approximation, the arithmetic of elliptic curves, algebraic and arithmetic geometry, and probability methods. Joint work with Jean Bourgain.

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Fri, 08/31/2012 - 20:17

Tue, 11/27/2012 - 21:15

terms:

- [School of Mathematics](#)