Samuel Eilenberg Lectures

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"The Langlands Program and Quantum Field Theory"

The Langlands Program was launched in the late '60s with the goal of relating Galois representations and harmonic analysis. In the last 20 years a geometric version has been developed, which leads to a mysterious duality between certain categories of sheaves on moduli spaces of (flat) bundles on complex algebraic curves, attached to two Langlands dual groups. This form of the Langlands correspondence turned out to be closely related to two different types of quantum field theories: first, 2D conformal field theory, defined on the curve X itself, and second, 4D supersymmetric gauge theory on the product of X and another curve. In these lectures, I will first give an introduction to the geometric Langlands correspondence and present some examples. Then I will talk about the connections to the 2D and 4D quantum field theories and what we can learn from them. Time permitting, I will also discuss the links between the 2D and 4D theories themselves, which have recently become the focus of extensive research.

Tuesdays at 2:40 pm	520 Mathematics Hall
First lecture: January 24	Columbia University