Colloquium

UNIVERSITY OF NOTRE DAME
Department of Mathematics

Speaker: Ana Caraiani
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Monday, November 16, 2015
4:00 PM
117 Hayes-Healy Hall

Title: Locally symmetric spaces, torsion classes, and the geometry of period domains

Abstract:

The Langlands program is an intricate network of conjectures, which are meant to connect different areas of mathematics, such as number theory, harmonic analysis and representation theory. One striking consequence of the Langlands program is the Ramanujan conjecture, which is a statement purely within harmonic analysis, about the growth rate of Fourier coefficients of modular forms. It turns out to be intimately connected to the Weil conjectures, a statement about the cohomology of projective, smooth varieties defined over finite fields. I will explain this connection and then move towards a mod p analogue of these ideas. More precisely, I will explain a strategy for understanding torsion occurring in the cohomology of locally symmetric spaces and how to detect which degrees torsion will contribute to. The main theorem is joint work with Peter Scholze and relies on a p-adic version of Hodge theory and on recent developments in p-adic geometry.