

## **abstract**

Joint IAS-PU Number Theory Seminar  
Topic:

Speaker:

Affiliation:

Date:

Time/Room:

---

I will describe the appearance of special values of Eisenstein series on E6, E7, and E8 that arose in studying the low energy expansion of the 4-graviton scattering amplitude in string theory (see [arxiv:1004.0163](#) and [1111.2983](#)). Through methods to handle the combinatorics of Langlands' constant term formulas we were able to exactly identify some correction terms beyond the main term predicted by Einstein general relativity. In some cases string theory predicts cancellations of terms in these formulas, while in others derives information from them. Some of the correction terms are proven to be automorphic realizations of small, real unitary representations of split real groups; this is used to limit the instanton contributions to these terms (i.e., verifying their fractional BPS properties). As a consequence of the combinatorial methods we prove a conjecture of Arthur concerning the spherical unitary dual of split real groups. (This is joint work with Michael Green and Pierre Vanhove.)