ALGEBRA AND NUMBER THEORY
SEMINAR

The arithmetic-geometric mean and p-adic limits of modular forms

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Abstract: The arithmetic-geometric mean of Gauss is the coincident limit of two sequences which arise naturally from systematically taking arithmetic and geometric means. Gauss proved that these sequences and their limit, the AGM, are parametrizable by values of modular forms. In this talk, we exhibit a sequence of weakly holomorphic modular forms whose p-adic limit parametrizes values of the AGM. The p-adic limit arises via the interplay between classical modular forms and harmonic weak Maass forms. The recent successes connecting harmonic Maass forms to partitions, Ramanujan's mock theta functions, Lie algebras, probability, and mathematical physics motivates independent interest in their study.

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