

abstract

Joint IAS-PU Number Theory Seminar
Topic:

Speaker:

Affiliation:

Date:

Time/Room:

A fake projective plane is a smooth complex projective algebraic surface whose Betti numbers are same as those of the complex projective plane but which is not the complex projective plane. The first fake projective plane was constructed by David Mumford in 1978 using p-adic uniformization. This construction is so indirect that it is hard to obtain geometric properties of the fake projective plane. A major problem in the theory of complex algebraic surfaces was to find all fake projective planes in a way which allows us to discover their geometric properties. In a joint work with Sai-Kee Yeung, which uses considerable amount of the theory of arithmetic groups, number theory and the Bruhat-Tits theory, this has been achieved. We have subsequently studied the question of existence and non-existence of arithmetic analogues of these surfaces in higher dimensions. I will describe the main results and the techniques used to prove them.