

Speaker: Kiran Kedlaya

Title: Etale and crystalline companions

Abstract: Consider a smooth variety X over a finite field of characteristic p . In the context of his proof of the Weil conjectures, Deligne made a far-reaching conjecture about category of lisse ℓ -adic sheaves on X , where ℓ is a prime different from p . In particular, he conjectured that under mild conditions, any such sheaf belongs to a compatible family of ℓ -adic sheaves for all ℓ different from p , as well as a then-mysterious member corresponding to $\ell = p$. We describe what the missing object looks like (it is an overconvergent F -isocrystal) and describe the key ingredients in the proof of Deligne's conjecture. These include the Langlands correspondence for global function fields with both ℓ -adic and p -adic coefficients (work of L. Lafforgue and T. Abe), a finiteness argument of Deligne, an ingenious argument of Drinfeld to build the ℓ -adic terms in the compatible system, and a very recent analogue of Drinfeld's argument in the p -adic setting.