

Speaker: Prof. Indranil Biswas, TIFR Mumbai.

Title: A characterization of finite vector bundles on compact complex manifolds

Abstract: A vector bundle E on a projective variety X is called finite if it satisfies a nontrivial polynomial equation with integral coefficients. A theorem of Nori says that E is finite if and only if the pullback of E to some finite étale Galois covering of X is trivial. We prove the same statement when X is a compact complex manifold.

Speaker: Prof. Madhavan Mukund, CMI Chennai.

Title: Logic, Automata and Program Verification

Abstract: For traditional programs, correctness can be specified as a functional relationship between inputs and outputs. This approach does not work for operating systems, webservers, ... that maintain an ongoing interaction with their environments rather than transforming inputs to outputs. We describe how logic can be used to specify properties of such “reactive systems” and show how we can develop automated procedures to check such properties using finite-state automata.

Speaker: Prof. E. K. Narayanan, IISc Bangalore.

Title: Role of Fourier analysis in the sphere packing problem

Abstract: Sphere packing problem is nearly 400 years old, which got solved recently in dimensions eight and twenty four. This is a fascinating area which brings various branches of mathematics together. This talk will be expository in nature where we will explain how the original problem can be reformulated as a classical Fourier analysis question (due to Henry Cohn and Noam Elkies) and give some ideas about the solutions in dimensions eight (due to Maryna Viazovska) and twenty four (due to Henry Cohn, Abhinav Kumar, Stephen Miller, Danylo Radchenko and Maryna Viazovska). The problem is completely open in dimensions above three except for eight and twenty four.

Speaker: Prof. Nandini Nilakantan, IIT-Kanpur.

Title: On Kneser's Conjecture

Abstract:

Speaker: Prof. R. Thangadurai, HRI Allahabad.

Title: Primitive roots modulo p

Abstract: It is a 200 year old problem that whether 10 is a generator of the multiplicative group of modulo p for infinitely many primes p . This problem of Gauss has been generalised by E. Artin in 1920's that any given square-free integer a not equal to 1 or -1 generates the multiplicative group of modulo p for infinitely many primes p . This is known as Artin's conjecture. In this talk, how Gauss came up with this statement and proved a result concerning for what natural numbers n , the multiplicative group of modulo n is cyclic. Moreover, we present a new result related to Gauss theorem. This talk is completely elementary and self contained.