1147-11-372 **Mahesh Kakde*** (mahesh.kakde@kcl.ac.uk). *Explicit formulae for Gross-Stark units and Hilbert's 12th problem.*

In this talk I will report on my joint work with Samit Dasgupta on the tower of fields conjecture first formulated by Gross. This conjecture proves a conjecture of Dasgupta on explicit p-adic analytic formulae for Gross-Stark units. These units, when considered for all primes of a totally real number field F, generate the maximal abelian CM extension of F and therefore our work can be considered as giving a p-adic analytic solution to Hilbert's 12th problem. Further, the tower of fields conjecture also proves a conjecture of Dasgupta and Spiess which gives a p-adic analytic formulae, in terms of Eisenstein cocycles, for the characteristic polynomial of the Gross regulator matrix. (Received January 21, 2019)