UNIVERSITY OF HYDERABAD

SCHOOL OF MATHEMATICS AND STATISTICS

UNIVERSITY OF HYDERABAD

Date : 2 January 2019
Time: 4p.m.
Venue : C.V.Raman Auditorium.

Maryam Mirzakhani Memorial Lecture

Sponsored by UGC-SAP, DSA-I

DIOPHANTINE EQUATIONS

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Abstract

A main focus of Number Theory, which Gauss called the Queen of Mathematics, is Diophantine equations, which are (a system of) polynomial equations (in two or more variables) where all the coefficients are all integers. Examples like $X^2+Y^2=Z^2$ and $X^2-dY^2=1$ were studied since time immemorial in many old civilisations, such as Babylon, China and India, where differing methods of solving them were developed. Diophantos (of Alexandria) developed a systematic way of dealing with all of them. In the modern viewpoint, these equations somehow are divided into three cases, one where there are infinitely many (or no) rational solutions, another in which there are only finitely many solutions, and the third intermediary one where either can happen. For the Fermat equation $X^N+Y^N=Z^N$, the first case occurs for N< 3 the second for N>3, and the intermediate case for N=3. The talk will end with a result (proved jointly with Mladen Dimitrov) about the finiteness of simultaneous solutions of the three equations in six variables $X_1^5 + Y^5 = Z^5$, $X_2^5 + W^5 = Z^5$ and $X_3^5 + W^5 = Y^5$.

All are welcome