SEMINAR
SCHOOL OF MATHEMATICS AND STATISTICS

DATE: 9 SEPTEMBER 2019

TITLE

Terms of Binary Recurrence Sequences which are products of factorials

VENUE | TIME

Seminar Room I
03:45 –04:45 PM

SPEAKER

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ABSTRACT

A conjecture of Hickerson states that the equation $n! = a_1! a_2! \cdots a_k!$ with $2 \leq a_k \leq a_{k-1} \leq \cdots \leq a_2 \leq a_1 \leq n - 2$ in positive integers implies $n \leq 16$. This is open. For a binary recurrence sequence $\{U_n\}_{n \geq 0}$, we show that the largest n for which $|U_n| = m_1! m_2! \cdots m_k!$ with $1 < m_1 \leq m_2 \leq \cdots \leq m_k$ satisfies $n < 3 \times 10^5$. We also give better bounds in case the roots of the binary recurrence sequence are real. As a consequence, we show that if $\{X_k\}_{k \geq 1}$ is the sequence of X-coordinates of a Pell equation $X^2 - dY^2 = \pm 1$ with a nonsquare integer $d > 1$, then the equation $X_k = n!$ implies $k = 1$. This is a joint work with F. Luca and M. Sias.

ABOUT THE SPEAKER

Working at Indian Statistical Institute, Delhi Center. Ph.D. from Tata Institute of Fundamental Research (TIFR), Mumbai . Area of interest are Number Theory & Cryptography, Irreducibility of Polynomials, Galois Group Problem, Diophantine Equations & Diophantine Approximation.

Awards : Microsoft Young Faculty Award in 2010–2011 and TAA-Harish Chandra Memorial Award in 2008 for the best Ph.D. Thesis in Mathematics at TIFR Mumbai