

IIT GUWAHATI MATHEMATICS SEMINAR SERIES presents  
a talk by

Prof. Anantharam Raghuram, Professor and Chair, Mathematics, IISER Pune  
as part of Fermat Day celebration.

Title of the Talk: From Calculus to Number Theory



*Perhaps, posterity will thank me  
for having shown that the ancients  
did not know everything.*

— Pierre de Fermat

$$\left. \begin{array}{l} F_0 = 2^2 + 1 = 3 \\ F_1 = 2^2 + 1 = 5 \\ F_2 = 2^2 + 1 = 17 \\ F_3 = 2^2 + 1 = 257 \\ F_4 = 2^2 + 1 = 65537 \end{array} \right\} \text{Fermat primes}$$

Fermat's Little Theorem

$$\text{Remainder } \left( \frac{a^{(p-1)}}{p} \right) = 1$$

where  $p$  is a prime number also  $a$  &  $p$  are co-primes

**Pierre de Fermat (1601– 1665)** was a French mathematician who is given credit for early developments that led to infinitesimal calculus, including his technique of adequality. In particular, he is recognized for his discovery of an original method of finding the greatest and the smallest ordinates of curved lines, which is analogous to that of differential calculus, then unknown, and his research into number theory. He made notable contributions to analytic geometry, probability, and optics. He is best known for his **Fermat's principle** for light propagation and his **Fermat's Last Theorem** which states that there is no solution in integers of the equation

$$x^n + y^n = z^n \quad (xyz \neq 0, n > 2)$$

Fermat, along with Pascal, is known as the founder of Theory of Probabilities. His views on fundamental principles of the subject became the foundation of probability theory. Fermat's theory of probabilities grew out of his early research into the theory of numbers



Prof. Anantharam

Raghuram completed his PhD in Mathematics from Tata Institute of Fundamental Research, Mumbai. After that he joined as an Assistant professor at Oklahoma State University, USA. Currently he is a Professor and Coordinator (Mathematics), Indian Institute of Science Education and Research (IISER), Pune.

His research interests are broadly in the interface of Number Theory, Representation Theory, Algebra, and Geometry. He is a recipient of Alexander von Humboldt fellowship for experienced researchers. He is also a Fellow of the Indian Academy of Sciences.

Venue: Conference Centre (Hall 3)

Date: 17<sup>th</sup> August 2018

Time: 5:00 PM