University of Florida, Mathematics Department
FIRST RAMANUJAN* COLLOQUIUM
by
Professor Manjul Bhargava**
Princeton University
on
Sums of squares and the "290 theorem"

Date and Time: 4:00 - 5:00pm, Monday, March 19, 2007
Room: FAB 103
Refreshments: After the lecture in the Atrium (LIT 339)

OPENING REMARKS
by
George E. Andrews*
Evan Pugh Professor - Penn. State Univ.
Distinguished Visiting Professor - UF

Abstract: The famous "Four Squares Theorem" of Lagrange asserts that any positive integer can be expressed as the sum of four square numbers. That is, the quadratic form $a^2 + b^2 + c^2 + d^2$ *represents* all (positive) integers? When does a general quadratic form represent all integers? When does it represent all odd integers? When does it represent all primes? We show how all these questions turn out to have very simple and surprising answers. In particular, we describe the recent work (joint with Jonathan Hanke, Duke University) in proving Conway's "290-Conjecture". This solves a problem of Ramanujan on quadratic forms.

THREE MATHEMATICS SEMINAR TALKS

Following the Colloquium, Professor Bhargava will give three seminar talks. The three seminars will work towards a precise statement and proof of Ramanujan's quaternary problem and Conway's 290-Conjecture.

JOINT NUMBER THEORY & COMBINATORICS SEMINARS
on

1. *The arithmetic of quadratic forms: an overview*
   Tue, Mar 20, at 12:50 pm in LIT 339

2. *Ramanujan's quaternary problem and finiteness theorems for quadratic forms*
   Tue, Mar 20, at 1:55 pm in LIT 339

3. *Effective finiteness theorems and the proof of Conway's 290-conjecture*
   Wed, Mar 21, at 3:00 pm in LIT 339

* ABOUT RAMANUJAN: Srinivasa Ramanujan (1887-1920), a self-taught genius from South India, dazzled mathematicians at Cambridge University by communicating bewildering formulae in a series of letters. G. H. Hardy invited Ramanujan to work with him at Cambridge, convinced that Ramanujan was a "Newton of the East"! Ramanujan's work has had a profound and wide impact within and outside mathematics. He is considered one of the greatest mathematicians in history.

** ABOUT THE SPEAKER: Professor Manjul Bhargava, at the young age of 32, is one of the most eminent mathematicians in the world. When appointed as Full Professor of Mathematics at Princeton University at the age of 28, he was the youngest to hold that high rank at Princeton. His phenomenal mathematical career began early and recognitions have come in rapid succession. He was the recipient of the Frank and Bennie Morgan Prize of the American Mathematical Society (AMS) for undergraduate research in 1996. As an undergraduate at Harvard, he was University Salutatorian and winner of the Hoopes Prize. He then went to Princeton University to do his PhD under the direction of Prof. Andrew Wiles of Fermat's Last Theorem fame. Bhargava wrote a phenomenal PhD thesis in which he obtained path-breaking extensions of Gauss composition law for binary quadratic forms. His thesis was published as four papers in the Annals of Mathematics. For this and other work, he has received the AMS Blumenthal Prize in January 2005, the Clay Mathematics Prize in November 2005, and the First SASTRA Ramanujan Prize in December 2005.

*** ABOUT THE SPONSOR: Evan Pugh Professor George Andrews of The Pennsylvania State University is the world's premier authority in the theory of partitions and work of the Indian mathematical genius Srinivasa Ramanujan combined. He is a Member of the National Academy of Sciences. He has close ties with the UF Mathematics Department which has one of the strongest programs on mathematics related to Ramanujan's work. He was a recipient of an Honorary Doctorate from UF in December 2002. Since 2005, he is a Distinguished Visiting Professor each year in the Spring term in the Mathematics Department.

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