PURDUE UNIVERSITY

Department of Mathematics

14th Annual Women in Mathematics Day

Jean E. Rubin Memorial Lecture

Tuesday, September 20, 2022

3:30 PM LWSN 1142

Refreshments will be served at 2:45 p.m. in the Library Lounge, MATH 311

Quadratic Forms Over Function Fields

Abstract: A classical theorem of Hasse-Minkowski leads to the fact that every quadratic form in at least five variables over a totally imaginary number field represents zero nontrivially. One is naturally led to similar questions concerning function fields of curves over totally imaginary number fields: Do quadratic forms in sufficiently large number of variables represent zero nontrivially over these fields? This is a big open question even for rational function field in one variable over a totally imaginary number field. The expectation is that every quadratic form in at least nine variables over such a field represents zero nontrivially; over function fields of p-adic curves, every form in nine variables admits a nontrivial zero. We shall explain some recent progress in this direction.

Speaker:

Parimala Raman

Emory University

Arts & Sciences Distinguished Professor of Mathematics

Parimala Raman received her M.Sc. from Madras University and her Ph.D. from Bombay University. For many years, she was a professor at the Tata Institute of Fundamental Research in Mumbai. She has held visiting positions at the Swiss Federal Institute of Technology (ETH) in Zürich, the University of Lausanne, University of California-Berkeley, University of Chicago, Ohio State Univerisity, and the University of Paris at Orsay.

She is a fellow of all three Indian academies of science. She was an invited speaker at the International Congress of Mathematicians in Zürich in 1994 and a plenary speaker at the 2010 ICM in Hyderebad. Her research has been recognized with the Bhatnagar Prize in 1987, an honorary doctorate from the University of Lausanne in 1999, and the Srinivasa Ramanujan Birth Centenary Award in 2003.

Parimala Raman works in algebra. Her research uses tools from number theory, algebraic geometry, and topology. Early in her career, she published the first example of a nontrivial quadratic space over an affine plane. In a series of publications, Parimala has worked on long-standing conjectures such as the second Serre's conjecture and the conjecture concerning the u-invariant of the function field of any curve over a p-adic field. Parimala was on the Abel prize selection Committee 2021/2022.

Jean E. Rubin was Professor of Mathematics at Purdue University from 1967 until her death in 2002. She earned a B.S. from Queen's College in New York City in 1948, an M.A. from Columbia in 1949, and a Ph.D. from Stanford in 1955. She taught at the University of Oregon and Michigan State before coming to Purdue. Professor Rubin was the author of more than 40 papers and five books in set theory and questions related to the axiom of choice.

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