

**University of Florida • Mathematics Department
15th Ramanujan* Colloquium**

by

Wen-Ching Winnie Li**

Distinguished Professor of Mathematics

The Pennsylvania State University

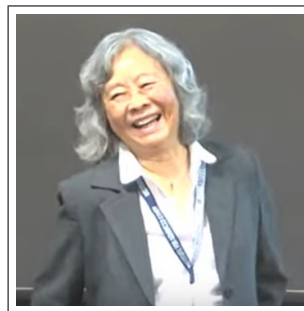
on

The Ramanujan Conjecture: from theory to applications

Date and Time: 4:00 - 4:55pm, Monday, April 1, 2024

Room: 101 Little Hall

Refreshments: Before Colloquium in Little Hall Atrium



OPENING REMARKS

by

Kevin Knudson (Math Dept Chair)

Abstract: Originally predicted by Ramanujan in 1916 for the discriminant function, the Ramanujan conjecture is a very deep statement concerning the size of the Fourier coefficients of cusp forms. The generalized Ramanujan conjecture expects that a generic unitary cuspidal automorphic representation of a reductive group over a global field should be locally tempered. While this conjecture is largely open to-date, it is established for certain cases. In this survey talk we explain some novel applications of the proven cases to explicit constructions of (a) Ramanujan graphs and Ramanujan complexes, (b) points uniformly distributed on spheres, and (c) Golden Gate sets in quantum computing. The Ramanujan conjecture is closely tied to the Riemann Hypothesis. We shall also explain the connection between Ramanujan graphs/complexes and the Riemann Hypothesis satisfied by their associated zeta functions.

Professor Li will also give two additional seminar talks.

- (i) Special Seminar: Tuesday, April 2, 10:40 – 11:30am in The Little Hall Atrium:

Zeta functions in number theory and combinatorics

- (ii) Number Theory Seminar: Tuesday, April 2, 1:55 – 2:45pm in The Little Hall Atrium:

Hypergeometric functions, Galois representations, and modular forms

* 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 Wen-Ching (Winnie) Li is a Distinguished Professor of Mathematics at Penn State University since 1979. She is a renowned Number Theorist specializing in automorphic forms with applications to coding theory and spectral graph theory. In 1981 she was a Sloan Fellow, was awarded the 2010 Chern Prize in Mathematics and is a Fellow of the American Mathematical Society.

ABOUT THE SPONSOR: Evan Pugh Professor Emeritus and Atherton 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. During 2008-2009 he was President of the American Mathematical Society.