University of Florida • Mathematics Department
14th Ramanujan* Colloquium

by
Professor Richard Stanley**
Arts and Sciences Distinguished Scholar
University of Miami, and Emeritus Professor, MIT

on
Euler Numbers

Date and Time: 4:00 - 4:55pm, Monday, April 3, 2023
Room: 101 Little Hall
Refreshments: Before Colloquium in Little Hall Atrium

OPENING REMARKS
by
Dean David Richardson (CLAS)

Abstract: A permutation $a_1 a_2 \cdots a_n$ of $1, 2, \ldots, n$ is *alternating* if $a_1 > a_2 < a_3 > a_4 < \cdots$. The number E_n of alternating permutations of $1, 2, \ldots, n$ is called an *Euler number*. We will survey the theory of alternating permutations and Euler numbers, beginning with the famous formula of Désiré André: $\sum_{n \geq 0} E_n \frac{x^n}{n!} = \sec x + \tan x$. Connections will be given to such topics as convex polytopes, tridiagonal matrices, probability theory, and the representation theory of the symmetric group. We will explain how the enumeration of alternating permutations that are also fixed-point-free involutions is related to an asymptotic result in one of Ramanujan's notebooks.

Professor Stanley will also give two additional seminar talks.

(i) Special Combinatorics Seminar: Tuesday, April 4, 10:40 – 11:30am in The Little Hall 223:
   The X-Descent set of a permutation

(ii) Number Theory Seminar: Tuesday, April 4, 1:55 – 2:45pm in The Little Hall 225:
   Two analogues of Pascal's triangle

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* 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: Richard Stanley is a Distinguished Scholar in Mathematics at the University of Miami. He was the Norman Levinson Professor of Applied Mathematics at MIT and has been Professor Emeritus there since 2018. He has made pioneering contributions to combinatorics and its connections with other areas of mathematics. He is a member of the National Academy of Sciences. His awards include the George Pólya Prize (1975), the AMS Leroy P. Steele Prize (2001), the Royal Swedish Academy Schock Prize (2003) and more recently the AMS Leroy P. Steele Prize for Lifetime Achievement (2022).

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.