

SRINIVASA RAMANUJAN

Srinivasa Ramanujan was born in 1887 in Erode, Tamil Nadu, India. He grew up in poverty and hardship. Ramanujan was unable to pass his school examinations, and could only obtain a clerk's position in the city of Madras. However, he was a genius in pure mathematics and essentially self-taught from a single text book that was available to him. He continued to pursue his own mathematics, and sent letters to three mathematicians in England, containing some of his results. While two of the three returned the letters unopened, G.H. Hardy recognized Ramanujan's intrinsic mathematical ability and arranged for him to go to Cambridge. Hardy was thus responsible for making Ramanujan's work known to the world during the latter's own lifetime.

Ramanujan made spectacular contributions to elliptic functions, continued fractions, infinite series, and analytical theory of numbers.

Ramanujan's health deteriorated rapidly while in England. He was sent home to recuperate in 1919, but died the next year at the age of 32.

RAMANUJAN PRIZE SCULPTURE

The Ramanujan Prize sculpture is an exact miniature replica of the statue of Srinivasa Ramanujan that is kept in the ICTP Marie Curie Library. The bronze bust of Ramanujan was donated to ICTP by the SASTRA University in India, where the original bust is kept.

A CELEBRATION OF MATHEMATICS

2017 RAMANUJAN PRIZE AWARD CEREMONY

ICTP
12 October 2017



2017 RAMANUJAN PRIZE CITATION

This year's Ramanujan Prize is awarded to Eduardo Teixeira of the Universidade Federal do Ceará, Brazil at the time of the award and now at the University of Central Florida. The prize is in recognition of his outstanding work in Analysis and Partial Differential Equations.

Teixeira started working on free boundary problems during his PhD thesis, proving existence and regularity results, and obtaining qualitative properties of solutions, in the theory of nonlinear heat conduction. Subsequently, in collaboration with L. Zhang, he obtained Almgren's type frequency formulas in Riemannian manifolds. He then introduced an original approach to the regularity of degenerate elliptic equations, which consists in viewing the set of critical points of a solution as a free boundary. This interesting point of view led him to prove the continuity conjecture for elliptic equations with high order singular structures, and in solving, in collaboration with Araujo and Urbano, a long standing conjecture on the optimal regularity for the p -Laplacian in two-dimensions. Teixeira has contributed to many other aspects of the theory of nonlinear elliptic equations. A perfect example is his recent breakthrough, in collaboration with Y. Li and Z.-C. Han, on the asymptotic radial symmetry of solutions to the k th-order Yamabe equation in punctured domains, a deep and original contribution to the theory of conformally nonlinear elliptic PDEs.

The 2017 Ramanujan Prize Selection Committee consisted of Idris Assani, Rajendra Bhatia, Alicia Dickenstein, Stefano Luzzatto (chair), and Van Vu.

RAMANUJAN PRIZE

In 2005 the Abdus Salam International Centre for Theoretical Physics (ICTP) established the Srinivasa Ramanujan Prize for Young Mathematicians from Developing Countries, named after the mathematics genius from India. This Prize is awarded annually to a mathematician under 45. Since the mandate of ICTP is to strengthen science in developing countries, the Ramanujan Prize has been created for mathematicians from developing countries. Since Ramanujan is the quintessential symbol of the best in mathematics from the developing world, naming the Prize after him seemed entirely appropriate.

The Prize is funded jointly by the Department of Science and Technology of the Government of India in collaboration with ICTP and the participation of the International Mathematical Union.

2017 RAMANUJAN PRIZE AWARD CEREMONY

12 October 2017

Budinich Lecture Hall, Leonardo Building

16:30 - 18:00

Programme

Welcome remarks by ICTP Director Fernando Quevedo

Introduction of Eduardo Teixeira, recipient of the 2017 Ramanujan Prize, by Stefano Luzzatto, ICTP

Congratulatory Videos from:

Shigefumi Mori, President, International Mathematical Union

Luis Caffarelli, University of Texas, Austin

Marcelo Viana, Director, IMPA, Rio de Janeiro, Brazil

Jacob Palis, Former Director, IMPA, and former member, ICTP Scientific Council

Ramanujan Lecture

"On Physical and Nonphysical Free Boundaries",
by Eduardo Teixeira, University of Central Florida
(formerly Universidade Federal do Ceará, Brazil)

Lecture Abstract

Free boundaries are mathematical manifestations of sharp changes in the parameters that describe a given problem. Typically, different physical laws are to be prescribed in distinct, a priori unknown subregions. This is the case, for instance, of problems involving different states of matter. Free boundaries also arise in physical reactions where interfaces retain some portion of the system's energy, viz., latent heat, membranes, dead cores, flux balances, and so forth. The development of the contemporary free boundary theory has promoted major knowledge leverage across pure and applied sciences and in this talk I will provide a panoramic overview of such endeavor. Towards the end, I will describe how geometric insights pertaining to the systematic study of free boundary problems can be imported as to investigate regularity issues in nonlinear diffusive partial differential equations, leading to a plethora of unanticipated results.