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. His 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

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.

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

2018 RAMANUJAN PRIZE AWARD CEREMONY

ICTP
9 November 2018

ICTP The Abdus Salam International Centre for Theoretical Physics

IAEA

Department of Science and Technology of the Government of India

International Mathematical Union (IMU)

2018 RAMANUJAN PRIZE CITATION

This year's Ramanujan Prize is awarded to Ritabrata Munshi of the Indian Statistical Institute, Kolkata, India and the Tata Institute of Fundamental Research, Mumbai, India. The prize is in recognition of Munshi's outstanding work in Number Theory.

More specifically, Ritabrata Munshi has made profound contributions to analytic number theory, in particular to the study of analytic properties of L-functions and automorphic forms. L-functions were defined in great generality by Robert Langlands, and while much is known about them from the representation theoretic and arithmetic geometry points of view, their deeper analytic properties are largely unknown.

In recent years, the work of Henryk Iwaniec and his collaborators has started to shed light on growth properties of these L-functions in the case of the group GL(2) proving what are now called subconvexity theorems. These theorems, which are actually estimates for the L-function on the "critical" line, represent progress towards the proof of the Lindelof hypothesis, which is one of the big open problems in analytic number theory, perhaps second only to the Riemann hypothesis.

Munshi takes these techniques to new levels by proving subconvexity theorems for some L-functions that come from GL(3). In a series of remarkable papers he has extended the reach of the classical Hardy-Littlewood-Ramanujan "circle method" to obtain sharp subconvexity estimates for L-functions arising from cusp forms on higher rank groups.

The progress from GL(2) to GL(3) is very hard-won and involves a lot of technical prowess as well as ingenuity. While many authors have established some special cases, Ritabrata's results are perhaps the most far-reaching and most general. In addition, he has made striking contributions to other areas in number theory like Diophantine equations, quadratic forms and elliptic curves. His work also makes clear that he is far from done, and that we should expect to see many more interesting results from him in the future.

The selection committee consisted of Rajendra Bhatia, Alicia Dickenstein, Stefano Luzzatto (chair), Philibert Nang and Van Vu.

2018 RAMANUJAN PRIZE AWARD CEREMONY

9 November 2018

Budinich Lecture Hall, Leonardo Building
14:30 - 18:30

Programme

Welcome remarks by ICTP Director Fernando Quevedo

*Musical interlude**

Ramanujan Lecture

by Ritabrata Munshi,
Indian Statistical Institute, Kolkata, India
and the Tata Institute of Fundamental Research, Mumbai, India

"The subconvexity problem for L-functions"

Abstract

Estimating the size of L-functions inside the critical strip is a central problem in the analytic theory of numbers. This problem has a long history originating in the works of Lindelof around 1908. Subconvex estimates often have deep implications in arithmetic and beyond. This talk will be a brief discussion of the salient features of this important problem.

*Musical interlude**

Distinguished Lecture by Brian Conrey

Executive Director, American Institute of Mathematics

"The world of L-functions"

Abstract

Much of Number Theory in the 21st century will be concerned with understanding L-functions. Indeed, two of the seven Millenium problems are about L-functions, including the 160 year old Riemann Hypothesis. What are L-functions? Why are they so important? And why are they so difficult? We will try to give some insight into this mysterious world.

Refreshments

Special screening, "Salam - the first ..... Nobel Laureate" with introduction by film director Anand Kamalakar

on occasion of World Science Day for Peace and Development

**Musical interlude performed by violinist Uroš Bubnič*