

BHARGAVA AND SOUNDARARAJAN TO RECEIVE THE FIRST SASTRA RAMANUJAN PRIZE

The 2005 SASTRA Ramanujan Prize will be jointly awarded to Professors MANJUL BHARGAVA (Princeton University) and KANNAN SOUNDARARAJAN (University of Michigan). This annual prize, being awarded for the first time, is for outstanding contributions by individuals not exceeding the age of 32 in areas of mathematics influenced by Ramanujan in a broad sense. The age limit was set at 32 because Ramanujan achieved so much in his brief life of 32 years. The \$10,000 prize will be awarded annually in December at the Srinivasa Ramanujan Centre of SASTRA University in Ramanujan's hometown, Kumbakonam, South India.

MANJUL BHARGAVA has made phenomenal contributions to number theory, most notably by his discovery of higher order composition laws. This is his PhD thesis, written under the direction of Professor Andrew Wiles of Princeton University and published as a series of papers in the Annals of Mathematics. Gauss, the Prince of Mathematicians, constructed a law of composition for binary quadratic forms. Bhargava introduced entirely new and unexpected ideas that led to his discovery of such composition laws for forms of higher degree. Bhargava then applied these composition laws to solve a new case of one of the fundamental questions of number theory, that of the asymptotic enumeration of number fields of a given degree d . The question is trivial for $d=1$, and Gauss himself solved the case $d=2$ in 1801. Then in 1971 Davenport and Heilbronn solved the $d=3$ case. Bhargava has now solved the $d=4$ and $d=5$ cases, which previously had resisted all attempts. Bhargava also applied his work to make significant progress on the problem of finding the average size of ideal class groups and on the related conjectures of Cohen and Lenstra. Bhargava's research has created a whole new area of research in a classical topic that has seen very little activity since the time of Gauss. Bhargava is currently a Full Professor at Princeton University, the youngest at that rank in that prestigious academic institution.

KANNAN SOUNDARARAJAN has made brilliant contributions to several areas in analytic number theory that include multiplicative number theory, the Riemann zeta function and Dirichlet L-functions, and more recently with the analytic theory of automorphic forms and the Katz-Sarnak theory of symmetric groups associated with families of L-functions. As an undergraduate at the University of Michigan, Soundararajan made two outstanding contributions. First, in joint work with R. Balasubramaniam, he proved a famous conjecture of Ron Graham in combinatorial number theory. Next he obtained some fundamental results on the distribution of zeros of the Riemann zeta function. Subsequently, in his PhD thesis, written under the direction of Professor Peter Samart of Princeton University, Soundararajan proved the spectacular result that more than $7/8$ -ths of quadratic Dirichlet L-functions have no zeros at the critical point $s=1/2$, thereby providing strong evidence for a conjecture of Chowla. A part of his PhD thesis is published in the Annals of Mathematics. More recently, in a paper with Brian Conrey in *Inventiones Mathematicae*, Soundararajan proved that a positive proportion of Dirichlet L-functions have no zeros on the real axis within the critical strip. In another paper in *Inventiones Mathematicae*, he and Ken Ono, assuming the generalized Riemann hypothesis, confirmed a certain conjecture of Ramanujan regarding a ternary quadratic form. Soundararajan is also a leading expert on random matrix theory and its implications in analytic number theory. Here his recent work with Hugh Montgomery shows that prime numbers in short intervals are distributed normally, but with a variance that is surprisingly different from classical heuristics. Soundararajan, considered to be one of the most creative young minds to emerge in the last decade, is currently Full Professor at the University of Michigan, Ann Arbor.

Bhargava and Soundararajan were selected as the top candidates from a pool of brilliant young mathematicians from around the world. The international panel of experts who formed the 2005 SASTRA Ramanujan Prize Committee are: (Chair) Krishnaswami Alladi - University of Florida, Manindra Agarwal - Indian Institute of Technology, Kanpur, George Andrews - The Pennsylvania State University, Jean-Marc Deshouillers - University of Bordeaux, Tom Koornwinder - University of Amsterdam, James Lepowsky - Rutgers University, and Don Zagier - Max Planck Institute for Mathematics, Bonn, and the College de France. This being the first year the award is given, the competition was especially strong and the decision was to give the prize to two equally deserving outstanding candidates.

Bhargava and Soundararajan will be awarded the prize during the International Conference on Number Theory and Mathematical Physics, December 19-22, 2005, at SASTRA University, where both will be invited to give talks on their work.

Krishnaswami Alladi
Chair, 2005 SASTRA Ramanujan Prize Committee

For an article describing the events leading to the launching of the SASTRA Ramanujan Prize, the prize ceremony, and the accomplishments of the winners, see Krishna Alladi's article [The First SASTRA Ramanujan Prizes](#).

[University of Florida](#) * [Mathematics](#) * [Contact Info](#)

Created Wednesday, October 12, 2005.
Please report problems to: www@math.ufl.edu
Last update made Wed Oct 19 11:13:17 EDT 2005.