

ICTS DISTINGUISHED LECTURE

The Atiyah Singer Index Theorem - an Overview

The Atiyah Singer theorem is one of the great theorems of 20th century mathematics. It is a theorem which is at the interface of three different areas of Mathematics: Differential Equations, Differential Geometry and Topology. In this talk I will essentially describe the theorem and make some historical remarks. The formulation of the theorem involves concepts from all the three areas mentioned and I will be spending much of the time to introduce some of these to make the talk accessible to people who may not be working in any one of these areas. I will however be assuming some familiarity with smooth manifolds and associated objects like vector bundles.

22 July 2024
3:00 PM

MADHAVA LECTURE HALL
ICTS, BENGALURU

Zoom Link :



Meeting ID: 934 5081 5887
Passcode: 232324

Madabusi Raghunathan

(Distinguished Professor,
UM-DAE Centre for Excellence in Basic Sciences
Honorary Fellow, TIFR)

Professor M.S.Raghunathan is one of the leading mathematicians in the world. He has made fundamental contributions to the structure and cohomology of discrete subgroups of Lie groups which have influenced the development of the subject: arithmeticity for higher Q-rank lattices in semi-simple Lie groups (settling a famous conjecture of A. Selberg in many cases); definitive results on the *congruence subgroup problem* which essentially classifies all finite index subgroups of "higher rank" arithmetic groups. His *Ergebnisse tract "Discrete Subgroups of Lie Groups"* is a fundamental reference in the subject. His conjectures on the relationship between ergodic theory and a number theoretic problem (the Oppenheim Conjecture) have influenced a lot of research in the area (and was eventually proved by Margulis). He is a recipient of numerous awards: Shanthi Swarup Bhatnagar award, invited speaker at the International Congress of Mathematicians, Padma Bhushan, and a Fellow of the Royal Society (to date, there have only been six mathematicians who are either from India or are of Indian origin who have received the FRS), Fellow of the TWAS and is a recipient of TWAS prize. He retired as a Professor of Eminence from the School of Mathematics, TIFR. He has had a number of distinguished students who have become famous researchers in their own right: Gopal Prasad, S.G. Dani, Vinay Deodhar. He is also deeply involved in the formation and running of the NBHM. He also organized the ICM in Hyderabad and it was due mainly to his efforts that the ICM was a great success. Since his student days, he has had an abiding interest in topology and geometry and it is very appropriate that he is speaking on one of the deepest theorems in geometry proved in the 20th century: the Atiyah-Singer Index Theorem.



academicoffice@icts.res.in



<https://www.icts.res.in/lectures/MSRaghunathan>

