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T.N. VENKATARAMANA

Citation for the award of the 2000 ICTP Prize in honour of Friedrich Hirzebruch in the field of Mathematics

The 2000 ICTP Prize in honour of Friedrich Hirzebruch in the field of Mathematics is awarded jointly to Sheng-Li Tan and T.N. Venkataramana.

T.N. Venkataramana has made very significant contributions to the area of Algebraic groups and their discrete subgroups. His work covers diverse topics in this important area of mathematics.

Venkataramana's early work deals mostly with structural properties of discrete subgroups of Algebraic groups. His most important contribution here is the work in which he extends the famous result of Margulis on the arithmeticity of lattices in higher rank real and p-adic groups to positive characteristics.

He proved (in collaboration with M.S. Raghunathan) the following much sought after theorem. Any co-compact arithmetic subgroup of the orthogonal group of a non-degenerate quadratic form of signature (n,1) with n different from 3 and 7 admits a subgroup finite index, whose first Betti number is non-zero. This result is proved by connecting it with the congruence subgroup problem, an unusual approach.

He has undertaken an extensive study of the restriction of cohomology classes on a locally symmetric manifold to a totally geodesic closed submanifold. In the case of holomorphic classes (in the hermitian symmetric case, handled in collaboration with L. Clozel) this yielded a proof of the abelianness of the Mumford-Tate groups of certain cohomologies of Shimura Varieties. He came up with very subtle ideas for dealing with the general case enabling him to prove that the Mumford-Tate groups are abelian for many more cases. Using these ideas he also settled in the affirmative a conjecture of Harris and Li.

Venkataramana's papers constitute a very valuable contribution to the present knowledge of various aspects of the theory of discrete groups. His work displays commendable scholarship and originality.