

name: KANAI, Masahiko

field: Geometry; especially differential geometry

keywords: Rigidity problems; especially those for group actions and foliations

perspective of my research: It is rigidity problems that have been attracting me for years. Among the remarkable successes in the problems that were made in the early stage are the strong rigidity theorem of Mostow and the super rigidity theorem of Margulis. For instance, the strong rigidity of Mostow says that under a reasonably ‘mild’ assumption a noncompact semisimple Lie group G is completely determined by its lattices which are by definition discrete subgroups Γ of G such that the quotients G/Γ have finite Haar measure. Most of all, I have been interested in rigidity of group actions and that of foliations, which could be interpreted as an infinite-dimensional analogue of the classical rigidity theorems such as those of Mostow and Margulis which deal with finite-dimensional Lie groups.

Let me give a list of mathematicians who made big contributions to the subjects:

A. Selberg, E. Calabi, A. Weil, H. Furstenberg, G. D. Mostow,
G. A. Margulis, W. Thurston, R. Zimmer, K. Corlette, M. Gromov,
R. Schoen, S. Hurder, A. Katok, R. Spatzier, ...

You should realize that the fields of those mathematicians widely spread out almost all over mathematics. Indeed, the theory has never been led to success without huge contributions from Lie group theory, representation theory, ergodic theory, the theory of dynamical systems, global analysis, differential geometry and so on and so forth. I wish to take a part especially as a geometer.

I am ready to supervise not only graduate students who intend to work with rigidity problems but also those who are interested in geodesic flows of negatively curved manifolds, typical hyperbolic dynamical systems that have a geometric origin, or in hyperbolic geometry, for instance.

what is expected to graduate students: I would like graduate student to be diligent and independent. Basic knowledge on differentiable manifolds, group theory and so on would be assumed.