Name : Hideko SEKIGUCHI

Research field : Lie groups and Representation Theory

Key words : Penrose transform, non-commutative analysis, semisimple Lie groups

My research interest:

My research interest is in the global analysis motivated by unitary representation theory of Lie groups. Loosely speaking, representation theory of Lie groups may be divided into two approaches, the study of representation theory itself and the study of its interaction of other fields of mathematics via the geometric realization of representations. From the latter approach, I study the global solutions of system of PDEs arising from the Penrose transform from non-compact complex manifolds by using infinite dimensional representations of semisimple Lie groups.

Suggestions to students:

Although Lie groups and their representation theory are related with various areas of mathematics, I would suggest undergraduate students to acquire basic knowledge that all undergraduate students are supposed to learn rather than superficial knowledge on advanced materials.

If you wish to study further, I would suggest you to read carefully the textbook:

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Lie Groups and Representation Theory,

T. Kobayashi and T. Oshima, Iwanami (2005)

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with pencils and papers. This book is recommended among other books with similar titles because it begins with basic materials and explains carefully *how* abstract theorems in various fields of mathematics are used and accumulated in the actual theory. The book has a high reputation as it is not merely explaining systematically what was known but also is giving a hint to create new things from nothing.