MATH-IMS Joint Pure Mathematics Colloquium Series
The Chinese University of Hong Kong

This Colloquium Series in Pure Mathematics is organized by the Department of Mathematics and the Institute of Mathematical Sciences (IMS) at The Chinese University of Hong Kong. The series focuses on all areas of pure mathematics together with theoretical developments and applications.

Date: November 25, 2022 (Friday)
Time: 4:30PM-5:30PM (Hong Kong Time)
Zoom Link: https://cuhk.zoom.us/j/98846779826

Basic Questions in Group-Theoretic Analysis on Manifolds

Speaker: Professor Toshiyuki Kobayashi
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Abstract: Symmetry of geometry induces symmetry of function spaces through the regular representation. In turn, it provides a group theoretic approach to global analysis such as the classical Fourier series expansion or more generally the spherical harmonics expansions where the "symmetry" is abelian or compact groups.

In this talk, we address some basic questions about the global analysis on manifolds X acted algebraically by highly non-commutative groups G such as SL(n,R).

Problem A. Does the group G control "sufficiently" the space of function on X?
Problem B. What can we say about "spectrum" for L2(X)?

We plan to discuss some recent progress with emphasis on "multiplicity" for Problem A and "decay of matrix coefficients" for Problem B.

Bio: Professor Kobayashi is currently a Full Professor at the University of Tokyo. He has made critical contributions to such areas as the theory of discontinuous groups in the non- Riemannian setting, the branching laws of unitary representations and multiplicity-free representations. He was an invited speaker at the 2002 International Congress of Mathematicians, and has received many prestigious awards, including the Spring Prize, the Humboldt Prize and the Inoue Prize for Science. He is a fellow of the American Mathematical Society.