



Theoretical Statistics and Mathematics Unit

Indian Statistical Institute

203 B.T. Road, Kolkata - 700108

SEMINAR

Date: July 29, 2026

Time: 04:15 PM

VENUE:

L-Infinity, 5th Floor, A.N. Kolmogorov Bhavan, ISI Kolkata

SPEAKER:

Tapendu Rana

Ghent University, Belgium

TITLE:

Fourier inequalities and general monotonicity in the hyperbolic geometry

ABSTRACT:

Pitt's inequality is a classical result in harmonic analysis that controls the weighted L^q norm of the Fourier transform by the weighted L^p norm of a function. In this talk, we explore the extension of this result to the Helgason Fourier transform on hyperbolic spaces and the Jacobi transform. Because exponential volume growth renders the classical general monotone (GM) class incompatible with this hyperbolic geometry, we introduce the ρ -general monotone (GM_ρ) class, which incorporates an exponential weight calibrated to the Jacobi measure. Relying on this new framework, we provide a sharp characterization of the shifted Pitt inequality. Furthermore, we reveal a striking rigidity phenomenon: conflicting constraints between the forward and reverse inequalities force $p = 2$ as the unique index for which the Boas conjecture holds, contrasting sharply with the Euclidean setting. If time permits, we will discuss connections to the Heisenberg uncertainty principle.

This talk is based on joint work with M. Ruzhansky and upcoming work with D. Gorbachev and S. Tikhonov.

ALL ARE CORDIALLY INVITED

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