CCSU

DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, September 30
2:00 – 3:00 PM
Maria Sanford, Room 101

GEOMETRIC INTERPRETATION OF THE TWO DIMENSIONAL POISSON KERNEL AND ITS APPLICATION TO THE ANALYSIS IN A EUCLEDIAN SPACE (Part 2)

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ABSTRACT

Herman Schwarz, while studying complex analysis at the end of 19-th century, introduced the geometric interpretation for the two-dimensional Poisson Kernel. We will open with the proof that the two dimensional Poisson kernel raced to any power represents an eigenfunction of a hyperbolic Laplacian and then, we shall see that the geometric interpretation considered in a multidimensional Euclidean space and combined with an elementary geometry can serve as a useful tool to analyze the behavior of eigenfunctions and eigenvalues of the hyperbolic Laplacian. In particular we obtain

1) One Radius Theorem saying that any two radial eigenfunctions of a hyperbolic Laplacian assuming the value one at the origin cannot assume any other common value within some interval [0,p], where the length of this interval depends only on the location of the eigenvalues on the complex plane and does not depend on the distance between them.
2) All eigenvalues for the Dirichlet eigenvalue problem stated in the three-dimensional hyperbolic ball. The corresponding radial eigenfunctions also will be computed explicitly.
3) The lower and upper bounds for the minimal eigenvalue in a Dirichlet eigenvalue problem.
4) If time permits, we shall see the application of the elementary geometry to analyze the behavior of radial eigenfunctions at infinity.

For further information:
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