CCSU

DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, September 23
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 1)

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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. In this presentation we shall see that the geometric interpretation considered in a multidimensional space and combined with elementary geometry can serve as a useful tool to obtain a number of results related to Euclidean Space. In particular, we develop

1) A new algebraic way to compute certain integrals arising in electrostatics.
2) A sufficient integral condition for a function depending only on distance to be harmonic.
3) An Integral identity satisfied by the two-dimensional Poisson Kernel.
4) A new derivation for a solution of the classical Dirichlet problem in (k+1)-dimensional ball of radius R or in its exterior. This derivation does not involve Green's identity or Green's function and relies only on the integral identity that will be obtain in 3).
5) Some non-trivial inequalities.

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