Analysis and Applications:
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Speaker: Detlef Muller (Christian-Albrechts-Universitat zu Kiel)

Date/Time: Wednesday, May 18, 2011 / 2:00-3:00 pm

Talk Title: Harmonic analysis related to finite type
hypersurfaces in 3-space

Abstract:

Consider a smooth hypersurface S in R3 of finite type, in the sense that every tangent plane has finite order of contact with S, and let dµ = _d_ be a surface carried measure with smooth, compactly supported density _ $\geq$ 0 with respect to the surface measure d_. In the talk, I shall address three, somewhat related problems associated to this setting: A. Find the best possible uniform decay estimates for the Fourier transform of the surface carried measure dµ. B. If we denote by At the averaging operator Atf(x) := RS f(x − ty)dµ(y), determine for which p's the associated maximal operator Mf(x) := sup t>0 |Atf(x)|is bounded on Lp(R3). C. Determine the range of exponents p for which a Fourier restriction estimate _ZS | ˆ f(x)|2 dµ(x)_1/2 $\leq$ CkfkLp(R3) holds true. The first problem is classical, and the other ones originate from seminal work by E.M. Stein. In joint work with I. Ikromov, and in parts with M. Kempe, we have given essentially complete answers to these problems (for question B at least if p > 2) in terms of associated Newton diagrams.