TEMPLE UNIVERSITY

Department of Mathematics

Analysis Seminar

Room 617 Wachman Hall

Monday, September 21, 2015, 2:40 p.m.

Radiation Conditions and Integral Representations in Higher Dimensional Scattering

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The Helmholtz equation plays a central role in Scattering Theory. Considered by Euler and Lagrange as early as 1759 in connection with sound propagation and vibrating membranes, a general solution theory for this equation has been first developed by H. von Helmholtz in 1860.

In this talk I will discuss a unified approach to radiation conditions for null-solutions of the Helmholtz operator which are Clifford algebra-valued. One of the key tools in this study is establishing various integral representation formulas for these null-solutions in the very general class of Ahlfors regular exterior domains. Our analysis contains as particular, more specialized cases, the scattering theories associated with the Maxwell systems and perturbed Dirac operators. This is based on joint work with Dorina Mitrea, Marius Mitrea, and Emilio Marmolejo-Olea.