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**Mathew Gluck\*** (mgluck@towson.edu), Department of Mathematics, Towson University, 8000 York Rd., Towson, MD 21252. *Embedding Inequalities for a Family of Integral Operators and Applications.*

In this talk embedding inequalities for a family of integral operators  $E_{\alpha,\beta} : L^p(\partial\mathbb{R}_+^n) \rightarrow L^q(\mathbb{R}_+^n)$  that include the classical Poisson extension operator and a Riesz potential type operator will be discussed. For the conformally invariant parameters the extremal functions are classified and the value of the optimal embedding constant is computed. As an application, for certain parameters we prove the embedding inequalities for bounded subdomains  $\Omega \subset \mathbb{R}^n$  and show that if the optimal embedding constant for  $\Omega$  is strictly larger than the optimal embedding constant for the unit ball, then the optimal constant is attained. We show that this criterion is satisfied by an annular domain whose hole is sufficiently small. Motivated by this fact we prove the existence of a domain  $\Omega$  equipped scalar-flat metric  $g$  in the conformal class of the Euclidean metric whose isoperimetric constant is strictly larger than that of the Euclidean ball. (Received September 11, 2018)