



# DEPARTMENT OF MATHEMATICAL SCIENCES

## Colloquium

**Jeffrey Case**

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**Title: Sharp Sobolev trace inequalities via conformal geometry**

ABSTRACT: Escobar proved a sharp Sobolev inequality for the embedding of  $W^{1,2}(X^{n+1})$  into  $L^{2n/(n-1)}(\partial X)$  by exploiting the conformal properties of the Laplacian in  $X$  and the normal derivative along the boundary. More recently, an alternative proof was given by using a Dirichlet-to-Neumann operator along the boundary and its close relationship to the  $1/2$ -power of the Laplacian. In this talk, I describe a new relationship between the conformally covariant fractional powers of the Laplacian due to Graham--Zworski and higher-order Dirichlet-to-Neumann operators in the interior, and use it to prove sharp Sobolev inequalities for embeddings of  $W^{k,2}$ . Other consequences of this relationship, such as a surprising maximum principle for the conformal  $3/2$ -power of the Laplacian, will also be discussed.

**Friday, September 28, 2018**

**11:00AM-12:00PM**

**Stratton Hall 203**