

# MATHEMATICS SEMINAR

## AREA, PERIMETER, TORSIONAL RIGIDITY, AND ISOPERIMETRIC SANDWICHES IN OPERATOR THEORY

Given a necklace placed on a table what shape encloses the largest possible area?

Among all drums with given surface area, what shape produces the lowest fundamental frequency?

Given a bar with uniform cross section of fixed area, for what shape of the cross section will the bar have the greatest resistance to twisting?

The answer to each of these questions (as well as several others) is a circle, and the statements can be expressed concisely using isoperimetric inequalities. I will discuss this classical topic, and then I will describe how some of these inequalities have reappeared in the modern area of Mathematics known as Operator Theory.

**Erik Lundberg, Ph.D.**

**Assistant Professor of Mathematics  
Florida Atlantic University**



**Following Dr. Lundberg's 30 minute talk will be a short presentation about the Mathematics Ph.D. program at Florida Atlantic University and an FAU mathematics graduate student panel to answer any questions.**

**Friday, October 28<sup>th</sup>, 2016**

**4:30 pm – 5:30 pm, Seidler Room 220**

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