

## ***GRADUATE STUDENT SEMINAR***

**Guest Speaker: Eric Wawerczyk**  
**University of Notre Dame**

**Date:** Monday, September 4, 2017

**Time:** 4:00 PM

**Location:** 125 Hayes-Healy Hall



***Lecture Title:***

**$\pi/4 = 1 - 1/3 + 1/5 - 1/7 + 1/9 - \dots$  and its consequences**

***Abstract***

The beautiful formula from the title was discovered by Leibniz and it was so beautiful in fact that he decided to seriously pursue mathematics because of it. The goal of this talk is to prove this formula as well as showing that this formula IS EQUIVALENT to the fact that the ring  $\mathbb{Z}[i]$  is a unique factorization domain. In order to achieve this we will compute residues of complex analytic functions, compute arithmetic invariants of the ring  $\mathbb{Z}[i]$ , and put them all together with one of the crowning achievements of 20th century number theory: The Analytic Class Number Formula. No knowledge of number theory will be assumed; only basic abstract algebra and Laurent expansions of complex analysis.