

COLLOQUIUM

3:30 P.M.

WEDNESDAY, NOVEMBER 18, 2009

BOEHM HALL 262

*The Riemann Hypothesis: A Million Dollar
Problem turns 150*

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ABSTRACT

On October 19, 1859, G. F. Bernhard Riemann submitted his historic paper, "ber die Anzahl der Primzahlen unter einer gegebenen Grsse" ("On the Number of Primes Less Than a Given Magnitude"), to the Berlin Academy. His article builds off of results due to Euler to relate the irregular distribution of prime numbers to a rather innocent looking function which Riemann called the Zeta Function. Connected with this equation, Riemann formulated a conjecture in his paper, based on his Zeta Function. Though this conjecture, now called the Riemann Hypothesis, is easy to understand, it has sparked 150 years of study and research in an attempt to find the elusive proof or a counterexample. In 2000, the Clay Mathematics Institute offered \$1,000,000 for a proof or counterexample to the Riemann Hypothesis to underscore the importance of this problem.

In this talk, we will discuss the historical background of Riemann and his Hypothesis. Then we will explore prime numbers and their distribution en route to defining the Zeta Function and stating the Riemann Hypothesis. This will lead us into generalizations of the Zeta Function and important consequences of the Riemann Hypothesis. We will conclude by showing evidence for and against the Hypothesis - directly and via other equivalent conjectures.

3:00 p.m.
refreshments served**3:10 p.m.**
talk begins