UtahStateUniversity

Department of Mathematics & Statistics

Colloquium Talk DAVID E BROWN **3:30, 12/2, BUS 116**

RIEMANN'S ZETA AT EVEN POSITIVE INTEGERS

$$1+\frac{1}{2^2}+\frac{1}{3^2}+\frac{1}{4^2}+\cdots=\zeta(2)=\frac{\pi^2}{6} \qquad 1+\frac{1}{2^3}+\frac{1}{3^3}+\frac{1}{4^3}+\cdots=\zeta(3)=??$$

ABSTRACT. *The Riemann Hypothesis* (RH) is the oldest of the seven Millennium Problems and, being a member of this group of problems, it enjoys a $1,000,000 bounty. RH is a conjecture about the zeros of the analytic continuation of the function $\zeta(s)=\sum_{n\geq 1}\frac{1}{n^s}$, called the *Riemann Zeta* function. In this talk, I intend to give a description of RH with the following promises: (1) It will illustrate the importance of RH with respect to Mathematics and the world writ large; (2) It will make clear the connections between the distribution of primes and the solution of RH; (3) It will be understandable to a high school student.

I will also evaluate $\zeta(s)$ for s an even positive integer. Exact calculation of $\zeta(s)$, where s is an odd positive integer, is an open problem.