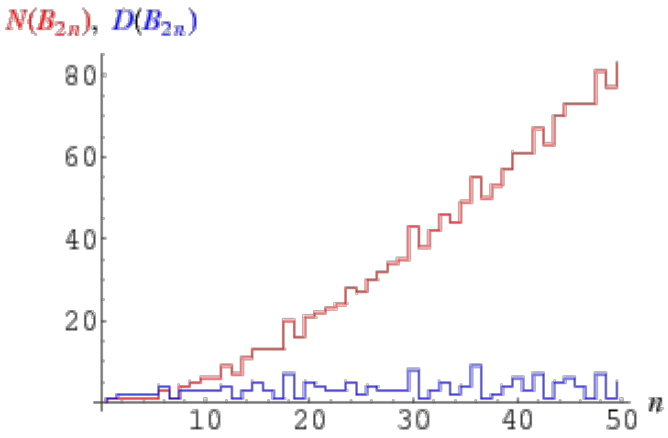
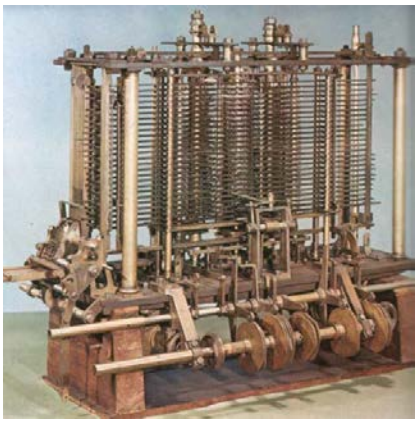
Department of Mathematics

Spring 2017 Colloquium Series





Feel the Bern - *The Bernoulli Numbers*!

Jeff Haag,
Humboldt State University

Thursday, February 9, 2017

Behavioral and Social Sciences Building Room 204, 4 pm

The Bernoulli numbers shine their light on mathematics from antiquity to today. They were glimpsed but unrecognized by early mathematicians including Pythagoras, (572-497 BCE), and Archimedes, (287-212 BCE), and were the intended output of what is widely regarded as the world's first computer program: an algorithm written in 1842 by Ada Lovelace for Babbage's Analytical Engine.

The Bernoulli numbers are an infinite sequence of rational numbers $\{B_k\}_{k=0}^{\infty} = \left\{1, \pm\frac{1}{2}, \frac{1}{6}, 0, -\frac{1}{30}, 0, \ldots\right\}$. They originally appeared in the calculation of sums of the form $1^m + 2^m + 3^m + \ldots + n^m$ where m is a positive integer. They are named after Jakob Bernoulli, (1654-1705), who used them to discover a general formula for the above sum.

The Bernoulli numbers have deep connections in analysis and number theory. In this talk, I will focus on some of the bright spots where they emerge in analysis, including series expansions and partial fraction decompositions of trigonometric functions and values of the Riemann zeta function.

Jeff Haag is a professor of mathematics and chair of the departments of mathematics and computer science at HSU. He has been at HSU since 1990. He enjoys recreational mathematics, recreational running, and other forms of recreation.

For a complete abstract, go to http://www.humboldt.edu/math/news-and-events/math-colloquium

We cordially invite you to the Pre-Colloquium Tea on the third floor of the BSS building at 3:30 pm on Thursday.