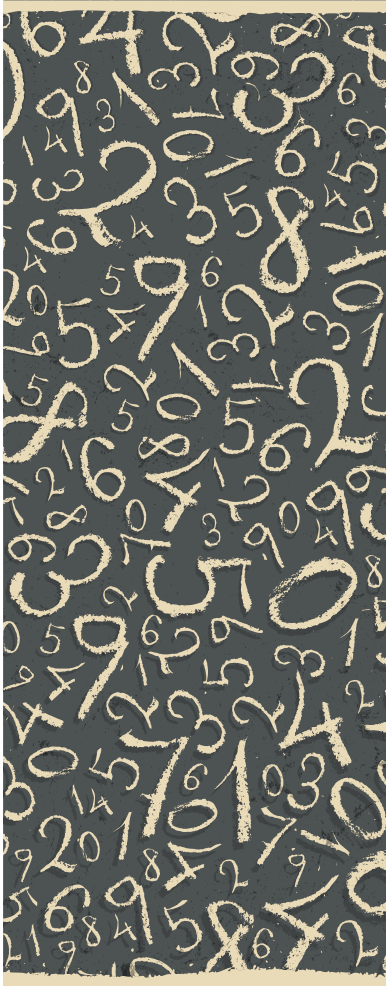# Math colloquium series

11.18.21 | 12:30PM-1:30PM

A number, N, is perfect when the sum of its positive divisors is exactly 2N. The first few perfect numbers are 6, 28, 496, ... Euclid studied them in his Elements in 300 BC, giving a nice classification of certain even perfect numbers.

This led to two of the oldest questions in number theory, and mathematics generally: Are there infinitely many even perfect numbers, and are there any odd perfect numbers? Two millennia later, in 1638, Descartes discovered $3^2 \cdot 7^2 \cdot 11^2 \cdot 13^2 \cdot 22021^1$. This would be an odd perfect number, if we erroneously pretend that $22021 = 19^2 \cdot 61$ is prime. We will discuss this and other examples of "spoof" perfect numbers, as well as how they help in the study of actual perfect numbers.

Spoof odd perfect numbers
Dr. Pace Nielsen
BYU