

# 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 "spoofer" perfect numbers, as well as how they help in the study of actual perfect numbers.

## Spoofer odd perfect numbers Dr. Pace Nielsen

