Fair Distribution of Prime Numbers

What: Bi-State Math Colloquium
When: Wednesday, April 17, 4PM
Where: Loras College, Hennessy 350
Who: Jonas Meyer

Prime numbers, like 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, and 53, have no factors other than themselves and 1. With an increase in size, the prime numbers become spread thin among the other whole numbers, because there are more potential factors to keep a number from being prime. For example, prime numbers make up 25% of the first 100 whole numbers, but only 17% of the first 1000, and only 8% of the first million. This leads to the following questions.

- Are the prime numbers a limited resource, eventually spread so thin that they run out completely? Or is there an infinite supply?
- Are there patterns in how the prime numbers are distributed among the other whole numbers? For example, can we describe how quickly the prime numbers thin out?

Supposing we want a fair distribution of prime numbers, we will consider ways of dividing primes among several groups, and see that considering primes in equally spaced sequences called arithmetic progressions leads to their equal distribution. To solve these problems and other related ones, we will explore theorems of Euclid, Dirichlet, Hadamard, de La Vallée Poussin, and others, to help understand the (fair) distribution of prime numbers.

Jonas Meyer graduated from Loras College in 2004 (not a prime number), went to grad school at the U of Iowa where he received a PhD in math in 2010 (not a prime number), and returned to Loras where he has taught math since 2011 (a prime number).