

Physics & Astrophysics Colloquium

Triangular Numbers Modulo m

Dr. Darin Ulness

Department of Chemistry

Concordia College

4:00 PM Friday, March 3, 2023, Room 211, Witmer Hall

Abstract:

If one starts writing the sequence $T = \{1, 3, 6, 10, 15 \dots\}$, a little bit of thought and checking, will show the value of the number at the n^{th} position is the sum of the numbers up to n . For example, the 6 in the 3rd position is from $1 + 2 + 3$. This sequence T is called the triangular numbers. One can now consider T modulo some integer m . For example, $T \bmod 4 = \{1, 3, 2, 2, 3 \dots\}$. In this colloquium we will explore some of the interesting patterns and symmetries that are hidden in these modular sequences. We will use techniques such as Fourier transformations and network graph analysis to reveal these patterns. While the primary results presented will be of a purely mathematical nature, we will discuss potential applications in optics, statistical mechanics, and quantum mechanics.

Refreshments at 3:30 PM in Witmer Hall, Room 215

For more information: Dr. Wayne Barkhouse, 701-777-3520, wayne.barkhouse@und.edu