BI-CO MATHEMATICS COLLOQUIUM

Dr. Michael Fisher

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"Olympic Games: Three Impartial Games with Infinite Octal Codes"

Monday, September 25, 2023
Talk at 4:30 PM – Park 338
Reception at 4:15 PM – Park 361, Math Lounge

Abstract:
A Combinatorial Game is a two-player game of pure strategy with no random elements. Players alternate moves and each player has complete information about the state of the game throughout the entire game. Each combinatorial game ends after a finite number of moves and the last move determines the winner (in Normal play, the last player to move wins, and in Misère play, the last player to move loses).

An impartial game is a combinatorial game in which each player has the same set of moves available to them at each stage of the game.

In this talk, we will look at the most famous impartial game of all, Nim. We will see how a related game, Wythoff, incorporates the concept of a Beatty sequence into this framework. From there, we will introduce the notion of octal game and analyze three subtraction games with infinite octal codes, showing how to play each game to win.

This work began as an undergraduate research project and should be accessible to third or fourth year undergraduate mathematics majors.

BRYN MAWR COLLEGE