CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, September 27
2:00 – 3:00 PM
Maria Sanford, Room 101

TIC-TAC-TOE AND
THE HALES-JEWETT CONJECTURE

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Abstract: In this talk, we will consider the two-player N^d Tic-Tac-Toe game played on a hybercube of edge size N and dimension d. Each player's goal is to be the first player to occupy N points in a line. It is well known (by young children) that in the 3 x 3 Tic-Tac-Toe game, the 2nd player's best hope is for a draw. The same is true in the N^d game. We will discuss when Player 2 can force a so-called Pairing Strategy Draw (PSD), where he is able to pair off a subset of the points such that each winning line is assigned its own pair of points. The Hales-Jewett Conjecture (1963) is that if the number of points is twice the number of lines, then a PSD exists. We will ask what this conjecture means about N, in terms of d, and how effective fractional matchings are in trying to prove this conjecture.