



# DEPARTMENT OF MATHEMATICAL SCIENCES

## Discrete Mathematics Seminar Series

**Padraig Ó Catháin**  
WPI

Title: Characteristic Polynomials of Hadamard matrices and incidence matrices

**Abstract:** While a fixed graph may have many different adjacency matrices, we can speak without ambiguity of the characteristic polynomial of that graph. This is because reordering the vertices of a graph induces the same permutation on the rows and columns of the adjacency matrix, so that all adjacency matrices for a fixed graph are similar. For many other classes of combinatorial structures (e.g. projective planes or Hadamard matrices) we do not insist that all incidence matrices are similar. So an equivalence class of Hadamard matrices is associated with many different characteristic polynomials. In this talk, I will discuss some recent work with Ronan Egan and Eric Swartz in which we developed some techniques for constructing Hadamard matrices with irreducible minimal polynomials, and some applications of our result.

**Tuesday, September 18, 2018**  
**2:00PM-2:50PM**  
**Stratton Hall 106**