Mathematics & Statistics Colloquium

When: Friday, October 31, 2:00 pm - 2:50 pm

Where: Lee Drain Building 400

The Sandpile Group of a Family of Series-Parallel Graphs
Bianca Mastache

The abelian sandpile group of a graph is defined as the cokernel of the reduced Laplacian of the graph. For instance, the sandpile group of the simple cycle graph on *n* vertices is the cyclic group of order *n*. A series-parallel graph is a graph with two vertices *s* and *t*, called terminals, that can be obtained through two operations on an edge: (a) joining two subgraphs in series, through a vertex-join of one terminal from each subgraph, or (b) joining two subgraphs in parallel, by identifying both the vertices *s* and *t* of from each subgraph. Our study focuses on the sandpile group of two families of series-parallel graphs: thick cycles and parallel compositions of thick paths. In this talk, I will present our results on obtaining a formulaic expression of the explicit structure of the sandpile groups of these two families.

Matrix Convexity and Operator Systems
Supun Samarakoon

In systems governed by Classical Mechanics, any experimentally observable value can be considered to be given by a scalar-valued function. In Quantum Mechanics we can consider system states to be vectors in a Hilbert space and thus we are no longer able to use the normal scalar-valued functions. The observables in Quantum Mechanics are matrices or linear operators. This gives rise to the study of noncommutative objects, such as operator systems. Finite dimensional operator systems are a class of subspaces of the *nxn*-matrices over the reals or complex numbers. We give a representation of certain 2-dimensional operator systems as spaces of matrix affine functions on compact matrix convex sets. This work gives noncommutative analogues of results on the representation of abstract `function systems' as spaces of continuous affine functions on compact convex sets.