Commutative Algebra
Algèbre commutative
(Org: **Giulia Gaggero** (McMaster University), **Mahrud Sayrafi** (Fields/McMaster University) and/et **Adam Van Tuyl** (McMaster University))

KIERAN BHASKARA, McMaster University

DENYS BULAVKA, Dalhousie University

SUSAN COOPER, University of Manitoba

SARA FARIDI, Dalhousie University
Extremal and D-Extremal ideals and their algebraic properties

Extremal ideals are square-free monomial ideals which model or bound the algebraic properties of all square-free monomial ideals and their powers. A refinement of this concept is the notion of D-extremal ideals, which also takes into account the divisibility relations between the generators of the ideals. This talk will be an overview of of what extremal ideals and what kinds of questions can be answered by them.

SELVI KARA, Bryn Mawr College
Algebraic Study of Polarized Neural Ideals

Neural codes, collections of binary strings representing the firing patterns of neurons, can be studied algebraically through their associated neural ideals. These ideals encode receptive field relationships among neurons in a stimulus space. However, neural ideals are not necessarily monomial (not even homogeneous) and do not yield standard graded invariants. We study their polarization, yielding squarefree monomial ideals that preserve combinatorial structure. Focusing on these polar neural ideals, we compute and bound their graded Betti numbers, projective dimensions, and regularity. In particular, we prove an upper bound on projective dimension for polar neural ideals on n neurons and classify when this bound is attained. This is joint work with Ellie Lew.

GRAHAM KEIPER, The University of Catania
Symbolic Powers of Toric Ideals

This talk will discuss some recent joint work with Giuseppe Favacchio relating to symbolic powers of toric ideals. We will go over the necessary background on toric ideals as well as symbolic powers. We will then discuss two new results useful in the computation of symbolic powers of toric ideals. The first result will involve a novel method of computing the symbolic powers of toric ideals via tensors and the second result will show how the symbolic powers of toric ideals can be computed in terms of a particular saturation.

IRESHA MADDUWE, Dalhousie University

HASAN MAHMOOD, Dalhousie University

EMANUELA MARANGONE, University of Manitoba

GREG SMITH, Queen's University

JANET VASSILEV, University of New Mexico
Patterns in differential powers of ideals in affine semigroup rings

Let R be a two-dimensional normal affine semigroup ring, one of whose facets lies on the x-axis, the other lying within the first quadrant. We will discuss how the slope of the second facet determines patterns for the differential powers of ideals whose radical is the canonical ideal.

DHARM VEER, Dalhousie University

JAY YANG, Vanderbilt University

SHAH RASHAN ZAMIR, Tulane University