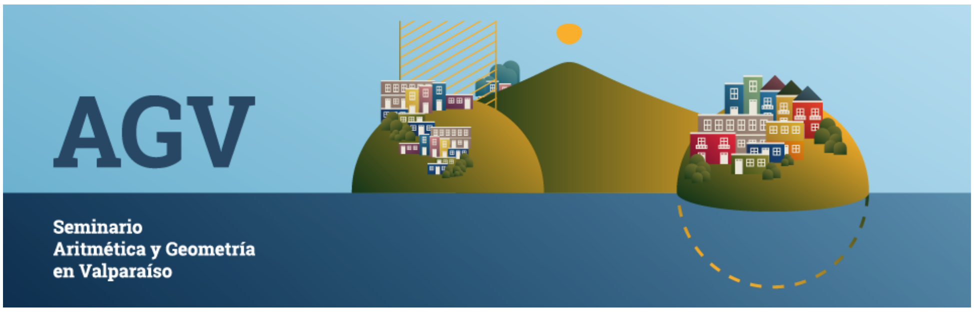

Stephen Griffeth
Universidad de Talca

Fecha: Miércoles 18 de abril 2018
Hora: 14:00-16:00
Lugar: Sala 2-2, IMA PUCV

Title, part I: Introduction to finite Hecke algebras and Schur elements

Finite Hecke algebras first arose as endomorphism algebras for induced modules of finite linear groups. For example, for a positive integer n and a finite field F with q elements, inducing the the trivial representation from the group of all $n \times n$ upper triangular invertible matrices to the group of all invertible matrices with entries in F produces a module whose endomorphism algebra $H_n(q)$ varies "polynomially" with q, suggesting the possibility of specializing q to numbers other than prime powers.

For instance, when $q = 1$ it is isomorphic to the group algebra of the symmetric group, and when q is a root of unity of prime order p its representation theory is closely related to the characteristic p representation theory of the symmetric group S_n.

The study of the representation theory of finite Hecke algebras is far from complete. One tool used to study them is the fact that they are self-dual in a strong sense: they are "Frobenius algebras". This self-duality allows, via the calculation of polynomials called "Schur elements", significant control over the induction and restriction functors relating representations of different finite Hecke algebras. I will explain the basic results and techniques for doing explicit computations.

Part II: Harish-Chandra series for rational Cherednik algebras (based on joint work with Daniel Juteau)

The rational Cherednik algebra associated with a reflection group W acting on a vector space V is an associative algebra that might be thought of as a non-commutative resolution of the symplectic quotient singularity $(V + V^*)/W$, in the same way that the universal enveloping algebra of a semisimple Lie algebra might be thought of as a non-commutative resolution of its nilpotent cone. Its representation theory may be studied using Harish-Chandra's philosophy of cusp forms, and is closely related to that of finite Hecke algebras. I will explain how Schur elements for finite Hecke algebras and certain special functions generalizing the Bessel functions may be used to compute the Harish-Chandra series of the "spherical" representation of the rational Cherednik algebra.

http://seminarioaritmeticaygeometria.wordpress.com