



MATHEMATICS AND STATISTICS
Faculty of Science

Algebra Seminar

Representation varieties, point counting, and characters of finite general linear groups Part 2

Tom Baird
Memorial University

Wednesday, February 20, 2019
2 p.m., HH-3017

Abstract:

Given a Riemann surface X (i.e., a compact, complex curve), we define the character variety $M_n := \text{Hom}(\pi_1(X), GL_n(\mathbb{C})) / GL_n(\mathbb{C})$ to be the set of homomorphisms from the fundamental group $\pi_1(X)$ to the complex general linear group $GL_n(\mathbb{C})$. This M_n is a very rich geometric object with many applications in topology, representation theory, and mathematical physics.

In 2008, Hausel and Rodriguez-Villegas calculated geometric invariants of M_n (the so-called E -polynomial) by counting homomorphisms from $\pi_1(X)$ into general linear groups $GL_n(\mathbb{F}_q)$ defined over a finite field \mathbb{F}_q . Their method makes use of the character theory of $GL_n(\mathbb{F}_q)$. In this lecture, I will discuss recent work with Michael Lennox Wong applying their techniques to a “real” analogue of M_n .