Department of Mathematics
University of Notre Dame

Richard Birkett - University of Notre Dame

GRADUATE STUDENT SEMINAR

Guest Speaker: Richard Birkett

University of Notre Dame

Date: Monday, October 28, 2019

Time: 4:00 PM

Location: 117 Hayes-Healy Hall

Lecture Title:

PULLBACKS OF RATIONAL MAPS, AND COMPLEX DYNAMICS

Abstract

In the dynamics of a self-meromorphic (rational) map f on a complex surface X, Gromov showed links between dynamical complexity and volume expansion of subvarieties, which in turn is given by the behaviour of $(f^n)^*$. However we encounter some elementary yet non-trivial problems with these pullbacks of divisors. For example, given $X \xrightarrow{f} Y \xrightarrow{g} Z$ morphisms, we all know that $(g \circ f)^* = f^* \circ g^*$, yet this *fails* in general for rational maps.

I take the work of J. Diller and C. Favre written with the currents and forms of differential geometry, and explain how it can be translated into the language of algebraic geometry. In this forerunner talk to my oral examination I will more carefully discuss the rather interesting issues with pullbacks, then proving that we can lift f to some $\hat{f} : \hat{X} \dashrightarrow \hat{X}$ where the pullback problem vanishes, while preserving all the dynamical information we need. This will set firm foundations for the dynamical results to be discussed in the final talk.