

## ***GRADUATE STUDENT SEMINAR***

**Guest Speaker: Juan Migliore**

**University of Notre Dame**

**Date:** Monday, April 9, 2018

**Time:** 4:00 PM

**Location:** 125 Hayes-Healy Hall



***Lecture Title:***

**Lefschetz Properties**

***Abstract***

Let  $R$  be a graded polynomial ring and  $I$  a homogeneous ideal. Then  $R/I$  is also a graded ring, and we can view its homogeneous components as finite dimensional vector spaces (i.e. think of  $R/I$  as an algebra). Assume  $R/I$  is artinian (i.e. there are only finitely many such components). Let  $L$  be a general linear form. Then multiplication by  $L$  induces a homomorphism from any component of  $R/I$  to the next. If you know the dimensions of all the components (i.e. if you know the Hilbert function of  $R/I$ ) then you may “expect” to know whether  $L$  is injective, surjective or an isomorphism. Failure depends on what  $I$  was, but for a lot of families of ideals we get the expected behavior, and for many families we fail to get the expected behavior. I’ll give a partial overview about what’s known and what’s still open in this subject. The takeaway: expect the unexpected!!