



# COLLOQUIUM

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**Equations and Syzygies for Varieties of Binary Forms**

**Friday November 6th at 3pm on Zoom**

<https://csuohio.zoom.us/j/91945126460>

*Bio:* Prof. Raicu is an Associate Professor in the Mathematics department at the University of Notre Dame, and his research work is in Commutative Algebra and Algebraic Geometry. Previously, Prof. Raicu was an Instructor in the Mathematics department at Princeton University, and a post-doctoral fellow at MSRI. He received his Ph.D. in 2011 from UC Berkeley, under the supervision of David Eisenbud.

*Abstract:* The space of binary forms of degree  $d$  has a natural stratification given by the factorization pattern of a form, which is indexed by the partitions of  $d$ . For instance, those binary forms that are  $d$ -th powers of a linear form trace out a rational normal curve. Those that factor as  $a^{(d-1)} * b$ , with  $a, b$  linear forms, describe the tangent developable of the rational normal curve, etc. It is an interesting open problem to describe the defining equations of the closures of the factorization strata, as well as their higher syzygy modules. I will discuss some of the known results and recent work on this problem, based on a beautiful interaction between geometry and the representation theory of  $SL_2$ .