

DEFENSE OF THE DOCTORAL DISSERTATION

DEPARTMENT OF MATHEMATICS

“Geometric Manin’s Conjecture for Fano Threefolds”

Eric Jovinelly

Tuesday, April 4, 2023

Time: 10:30 AM

Location: 347 DeBartolo Hall

Examination Committee:

Eric Riedl, Advisor

Juan Migliore

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Abstract:

A smooth variety is called Fano if its anticanonical line bundle is ample. These varieties play a fundamental role in the minimal model program, which decomposes varieties into Fano-like part and a minimal part. As observed by Mori, the geometry of Fano varieties is closely related to families of rational curves they contain. In this talk, I will first review a recent conjecture of Lehmann and Tanimoto, Geometric Manin's Conjecture (GMC), that extrapolates a well-known conjecture in number theory to a hypothetical structure for families of rational curves on Fano varieties. I will then describe a recent proof of GMC for smooth Fano threefolds of Picard rank at least two over the complex numbers, appealing to relationships between the framework for (Geometric) Manin's Conjecture and the Mori structures of Fano threefolds. This classifies families of rational curves on such varieties.