



Department of
Mathematical Sciences

Dissertation Defense

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PhD Graduate Student

Under the Supervision of Dr. Jeb Willenbring

**Thursday,
Apr. 23, 2020
at 12:30 pm**

*Online via
Blackboard
Collaborate*



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Asymptotic Probability of Incidence Relations over Finite Fields

Given four generic lines in projective 3-space over a field F , we ask, "How many lines meet the four?" The answer depends on the field. When F is the complex numbers, the answer is two. When F is the real numbers, the answer is either zero or two.

If we work over a finite field with q elements, there are only finitely many projective lines. We compute the probability four lines are met by two. The main result is that as q approaches infinity, this probability approaches $1/2$. Asymptotically, the other half of the time zero lines will meet the four.

Committee Members:

Prof. Jeb Willenbring (Advisor); Allen Bell, Craig Guilbault, Kevin McLeod & Yi Ming Zou



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