CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, February 28
3:00 – 4:00 PM
Maria Sanford, Room 101

THE MATHEMATICS OF CONTINGENCY TABLES, PART II

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Abstract: Last fall semester I gave the colloquium, "The Mathematics of Contingency Tables, Part I," which introduces the basic ideas of contingency tables that will be built on in this talk. The goal of Part II is to analyze 2-by-2 contingency tables with the machinery of algebraic statistics, which combines algebraic geometry with Markov Chain Monte Carlo (MCMC). By restricting ourselves to a two-dimensional contingency table, the complexity of the mathematical tools is restricted, so it is easier to see how they work.

The first paper introducing algebraic statistics came out in 1998 by Persi Diaconis and Bernd Sturmfels, so this is a recent area of research that is pursued by both statisticians and mathematicians. This colloquium is based on ideas from the two books: *Markov Bases in Algebraic Statistics* by Satoshi Aoki, Hisayuki Hara, and Akimichi Takemura; and *Ideals, Varieties, and Algorithms* by David A. Cox, John Little, and Donal O'Shea. The emphasis of this talk will be on understanding the underlying mathematical ideas and how they apply to contingency tables.

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