

SCMS Seminar



SIEGEL'S THEOREM, EDGE COLORING, AND A HOLANT DICHOTOMY

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Lecture

Time: 14:00-15:00, Tuesday, Monday, Aug 6th

Venue: Room 2201, East Main Guanghua Tower, Handan Campus

Abstract: What does Siegel's theorem on finiteness of integer solutions have to do with complexity theory? In this talk we discuss a complexity dichotomy theorem for counting problems. Such a dichotomy is a classification of a class of problems into exactly two kinds: those that are polynomial time computable, and those that are #P-hard, and thus intractable. An example problem in this dichotomy is the problem of counting the number of valid edge colorings of a graph. We will show that an effective version of Siegel's theorem and some Galois theory are key ingredients in the proof of this dichotomy. Along the way we will also meet the Tutte polynomial, medial graphs, Eulerian orientations, Puiseux series, and a certain lattice condition on the (logarithm of) the roots of polynomials with integer coefficients.

Joint work with Heng Guo and Tyson Williams.