

Department Colloquium

Speaker: Claude Tardif, RMC/Queen's University

Time: 2:30 p.m.

Place: Jeffery 234

Title: The chromatic number of the plane, axioms, and constraint satisfaction problems

Abstract: The chromatic number of the plane is the smallest number of colours sufficient for colouring the plane in such a way that no two points of the same colour are unit distance apart. Edward Nelson formulated the problem of determining the chromatic number of the plane in the early fifties. It is quite easy to show that this number is between 4 and 7, but no further progress has been made in sixty years. Will we ever know the answer?

Better yet: Is there even an answer? In this talk, I will present the argument of Shelah and Soifer according to which the chromatic number of the plane may depend on which model of set theory we decide to live in. This leads to examining the fascinating (in my opinion) world of little-known axioms below the axiom of choice. I will talk about my work with Danny Rorabaugh and David Wehlau on connecting these axioms to the computational complexity of constraint satisfaction problems.