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The Chromatic Number of the Plane, et al.

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The Hadwiger-Nelson Problem asks for the chromatic number of the plane as a unit-distance graph (i.e., the minimum number of colors needed to color the points of the real plane so that no two points of distance 1 receive the same color). This problem was invented by Edward Nelson in 1950, and still has not been solved despite considerable attention from many. Currently, we know that the answer is either 4, 5, 6, or 7, but very little is known beyond this. In fact, it is possible that the answer will depend on the axiom of choice. In this talk I will introduce the problem and discuss variations of it, such as restriction to a subfield of the reals and weakening of the distance condition.

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