COMBINATORICS SEMINAR
Borsuk's Problem And The Chromatic Number Of A Space

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Abstract:

In this talk, we will discuss two classical problems of combinatorial geometry. The first one goes back to K. Borsuk and is in finding the minimum number of parts of smaller diameter, into which any bounded set in R^n can be decomposed. The second problem is due to E. Nelson, P. Erdös, H. Hadwiger et al. It consists in determining the smallest number of colors needed to paint all the points in a metric space so that the points at some fixed distance a apart receive different colors.

First, we will give a survey of various results obtained for both problems. Then, we will exhibit deep and surprising connections between the problems that were discovered quite recently. Finally, we will propose new questions and conjectures.