

Discrete Mathematics Seminar

Time: Friday, 3 April 2015, 2:00-3:00 PM
Room: 237 Derrick Hall
Title: Warmth and edge spaces of graphs
Speaker: Dr. Anton Dochtermann, Department of Mathematics, UT Austin

Abstract:

In recent years two novel approaches for finding lower bounds on the chromatic number of a graph have been introduced. One involves studying the topological connectivity of the 'edge space' of a graph, dating back to Lovasz's celebrated proof of the Kneser conjecture. The other is motivated by constructions in statistical physics, and involves the notion of the 'warmth' of a graph introduced by Brightwell and Winkler.

We seek to relate these two constructions, and in particular we provide evidence for the conjecture that the warmth of a graph G is always less than three plus the connectivity of its edge space. We succeed in establishing the first nontrivial case of the conjecture, and calculate the warmth of a family of graphs with relevant edge space topology. We also demonstrate a connection between the warmth of a graph and the collection of complete bipartite subgraphs that it contains, providing an analogue for a similar result in the context of edge spaces. This is joint work with Ragnar Freij.

Bio:

Dr. Dochtermann received his PhD from the University of Washington in 2007, where his advisors were Eric Babson and Isabella Novik. His research interests lie in topological combinatorics and combinatorial commutative algebra. He has held postdoctoral positions at TU Berlin (as an Alexander von Humboldt fellow), as well as Stanford and U Miami. He is currently a lecturer at UT Austin.