



SEMINARIUM MATEMATYKA DYSKRETNA

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Treewidth of graphs with forbidden induced subgraphs

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The notion of treewidth and tree decompositions plays a central role in the study of graphs with forbidden minors. Besides structural characterizations, the property of having bounded treewidth, or a tree decomposition with certain "nice" properties, can be used algorithmically. However, until very recently, there were very few results that allowed to analyze the treewidth of graphs that exclude certain induced subgraphs. Indeed, a large clique has large treewidth, but is H -free for any graph H which is not a clique. It turns out that some interesting relations between the two worlds can be found if we additionally put some restrictions on vertex degrees - either just by bounding the maximum degree, or, in some cases, by bounding the degeneracy.

During the talk we will discuss some results of this flavor. In particular, we will show (or sketch) that

- graphs of bounded degeneracy that exclude all cycles of length at least t have bounded treewidth;
- graphs of bounded degree that exclude a fixed subdivision of the claw admit a certain type of an "*induced* grid/wall theorem": they either contain the line graph of a big subdivided wall as an *induced subgraph*, or have bounded treewidth.

Based on the joint work with Gartland, Lokshtanov, Pilipczuk, Pilipczuk, and with Abrishami, Chudnovsky, and Dibek.