

Optimal decompositions of quasi-line trigraphs

Date Tuesday, October 18

Time 4:30 pm

Location 303 Mudd

Abstract: Chudnovsky and Seymour's structure theorem for quasi-line graphs has led to a multitude of recent results that exploit two structural operations: *compositions of strips* and *thickenings*. In this paper we prove that compositions of linear interval strips have a unique optimal strip decomposition in the absence of a specific degeneracy, and that every claw-free graph has a unique optimal *antithickening*, where our two definitions of *optimal* are chosen carefully to respect the structural foundation of the graph. Furthermore, we give algorithms to find the optimal strip decomposition in $O(nm)$ time and find the optimal antithickening in $O(m^2)$ time. For the sake of both completeness and ease of proof, we prove stronger results in the more general setting of trigraphs. This gives a comprehensive "black box" for decomposing quasi-line graphs that is not only useful for future work but also improves the complexity of some previous algorithmic results.

Joint work with Maria Chudnovsky.