Using Complex Semidefinite Programming for Combinatorial Optimization Problems

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In the last few years there have been several applications of semidefinite programming to combinatorial optimization. In this talk, I will propose the use of complex semidefinite programming, i.e. the extension of semidefinite programming in which one replaces the real symmetric matrices by complex Hermitian matrices. I will present two applications which appear to be particularly well suited for complex semidefinite programming and will present improved approximation algorithms for them. This is work in progress and this is joint with David Williamson from IBM Research.