

**99k:90132** 90C27 05C50 68R10 90-02

**Goemans, Michel X.** (B-UCL-O)

**Semidefinite programming and combinatorial optimization.**

(English. English summary)

Proceedings of the International Congress of Mathematicians, Vol. III (Berlin, 1998).

*Doc. Math.* **1998**, *Extra Vol. III*, 657–666 (*electronic*).

This is a survey paper on the application of semidefinite programming in combinatorial optimization. The famous Lovász theta function, with its theoretical consequences, is discussed, as well as the semidefinite relaxation of the maximum cut problem with its worst-case performance results by the author and Williamson. Moreover, a situation is described in which the semidefinite programming relaxation reduces to a linear program, viz. if the adjacency matrix can be generated by an association scheme. The survey is concluded with a discussion of the Lovász-Schrijver procedure to generate valid inequalities for  $\{0, 1\}$ -programming, resulting in a semidefinite programming problem. Obviously, there are more applications of semidefinite programming in combinatorial optimization, but these three “classical” cases illustrate the main ideas very well.

{For the entire collection see 99e:00025}

*Jos F. Sturm* (NL-TILB-EN)