McGill Computational Science and Engineering Seminar

Friday February 18th at **14:00** in Burnside Hall room 1205

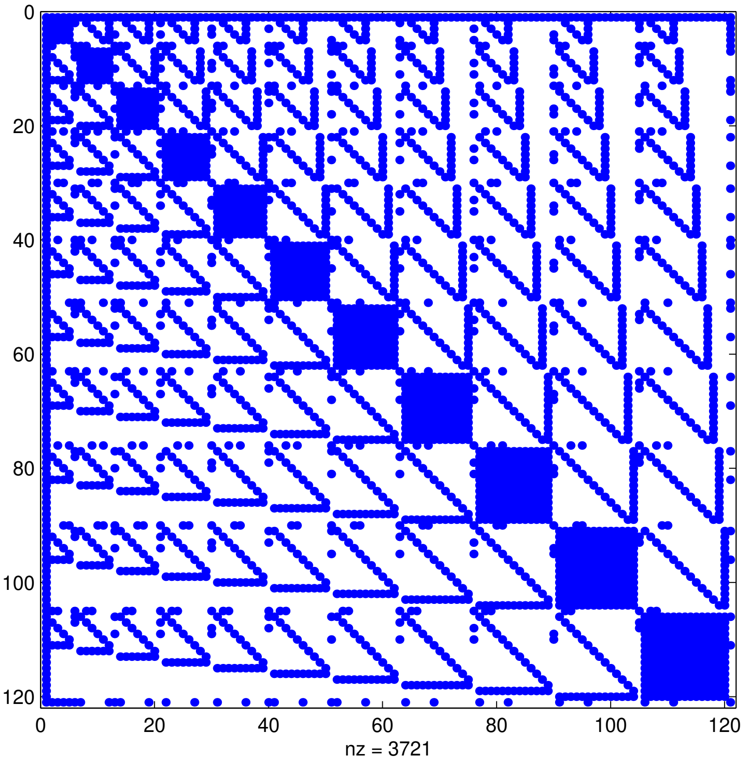
Semidefinite Relaxations for the Max-Cut Problem

Miguel F. Anjos,
Department of Combinatorics & Optimization, University of Waterloo

Semidefinite programming has become an area of intense research in recent years. One reason for this is its application in computing bounds for quadratic boolean optimization. In this talk we consider the Max-Cut problem for a general graph; this problem has a variety of applications, for example in network design, statistical physics and VLSI circuit layout design.

We will begin by describing the Max-Cut problem and presenting one way to formulate it as a quadratic boolean optimization problem. We will then introduce some basic ideas from Lagrangian duality and use them to derive the well-known semidefinite programming relaxation for Max-Cut. A similar derivation, together with the use of redundant quadratic constraints, yields a stronger relaxation with favourable properties. We will present our main theoretical results and some computational results on this new strengthened relaxation.

This is joint work with Professor Henry Wolkowicz.



One of the intriguing sparsity patterns arising in the new relaxation

Coffee and desserts are served after the seminar at 15:00 in the lounge, Burnside Hall 1024