

ON GRAPHS WITH EXTREMAL INDEX
- SURVEY

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The largest eigenvalue of a graph (also called the index) plays an important role in spectral graph theory, and its applications (in particular in chemistry). One of the most common problems related to the index is to find (or only to characterize) within the class of some graphs, those graphs whose index is extremal, either maximal or minimal. This problem can be also viewed as a problem of combinatorial optimization. In this talk we will give a survey of the most important results from this topic, with a special emphasize on the techniques used for getting these results.

STAR COMPLEMENTS - A SURVEY

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A star complement of a simple graph is its subgraph defined by making use of some spectral means. There are two equivalent ways to define a star complement of graphs (i) computational - based on using their characteristic polynomials, and (ii) geometrical - based on using their eigenspaces. In this talk we will give both approaches in order to show how they complement each other in deriving some basic properties of star complements. It is worth mentioning that star complements give rise to a new type of reconstruction problems for graphs. Some applications of star complement technique on graphs whose least eigenvalue is equal to -2 will be given in more details.