On the Generalized Spectral Characterizations of Graphs

Wei Wang
Xi'an Jiaotong University
wang_weiw@xjtu.edu.cn

"Which graphs are determined by their spectra?" This has been a long-standing unsolved problem in spectral graph theory. The problem originates from chemistry more than 60 years ago and is closely related to many other problems of central interest such as the graph isomorphism problem and the famous problem of Kac "Can one hear the shape of a drum?" It is generally very hard to show a given graph to be determined by its spectrum. We shall consider the problem in the context of the generalized spectrum. We say a graph G is *determined by its generalized spectrum*, if whenever H is a graph such that H and G are cospectral with cospectral complements, then H is isomorphic to G. In this talk, I shall report some recent results, as well as some open questions, on this topic.