
Analyzing the behavior of complex networks is an important element in the design of new man-made structures such as communication systems and biologically engineered molecules. Because any complex network can be represented by a graph, and therefore in turn by a matrix, graph theory has become a powerful tool in the investigation of network performance.

This self-contained book provides a concise introduction to the theory of graph spectra and its applications to the study of complex networks. Covering a range of types of graphs and topics important to the analysis of complex systems, this guide provides the mathematical foundation needed to understand and apply spectral insight to real-world systems. In particular, the general properties of both the adjacency and Laplacian spectrum of graphs are derived and applied to complex networks. An ideal resource for researchers and students in communications networking as well as in physics and mathematics.

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