What is the core distribution of a graph telling us?

The $k$-core of a graph is its largest subgraph such that all nodes have degree at least $k$ in the subgraph. The shell index of a node, the largest core it belongs to, can be used a measure of importance of a node. We propose to model networks by their shell structures and discuss network models based on the core decomposition of a graph. (Received August 11, 2015)