# The large-scale structure of complex networks

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- Lecture contents
  1. Terminology: Graph/Network, vertices/nodes, edges/links/ties, degree, degree-distribution
  2. Introduction to community structure: old and modern definitions and examples
  3. A short introduction to random graph models: Erdos-Renyi graph, configuration model
  4. Assortativity, Centrality (degree and betweenness)
  5. Modularity maximization and Newman-Girvan algorithm
  6. Problems with the traditional community detection algorithms: Structure vs noise, degeneracy, resolution limit, different methods-different answers
  7. Blockmodeling
- Lab contents
  1. Graph visualization using networkx
  2. Generating Erdos-Renyi graph and Stochastic block models
  3. Calculation of path length between two vertices
  4. Newman-Girvan algorithm