



Colloquium
Wednesday May 2, 2007
12pm Room 08-2130

**“DETECTING COMMUNITIES IN
COMPLEX NETWORKS”**

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Many interesting, real-world networks exhibit highly irregular structure. One example is the concept of *communities*: groups of nodes that are densely connected amongst themselves while being sparsely connected to other groups. Identifying this structure is a difficult graph partitioning problem with applications in many areas including disease propagation, CPU optimization, and the study of drug and protein interactions. Communities also provide a natural course graining to appropriately reduce the size of large networks, for visualization and other purposes. Popular existing methods include spectral bisection, divisive, and agglomerative algorithms. Of particular interest are so-called *local methods*, whereby a single community can be identified without knowledge of the entire network. Many real-world networks, such as the WWW, are simply too large to be fully explored, yet one may wish to know the community containing a particular node. Several local algorithms, as well as quasi-local and global applications, will be presented. Synthetic benchmarks and real-world examples, as well as difficulties specific to local methods, will also be discussed.

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School of Mathematical Sciences Colloquium Series