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*Models of Scientific Communication from Large-Scale Usage  
Data*

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**Abstract:** Scientific communication can be modeled on the basis of citation networks in which the flow of ideas is expressed by citations that point from one scientific publication to another. A number of graph-theoretical methods can be brought to bear on such citation networks to determine the status of particular publications and infer general properties of the scientific communication process. However, as scientific activity increasingly moves online, it becomes possible to study scientific relationships and processes from online usage patterns. In this colloquium I will present two applications of the analysis of large-scale usage data logs now commonly collected by scholarly web portals, namely modeling and mapping of the structure of scientific activity, and determining the components of scientific impact.

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MATHEMATICS AND COMPUTER SCIENCE  
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