Inhomogeneous Random Graphs

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The ‘classical’ random graphs, introduced by Erdős and Rényi half a century ago, are homogeneous in the sense that all their vertices play the same role and the degrees of the vertices tend to be concentrated around a typical value. Many graphs arising in the real world do not have this property, having, for example, power-law degree distributions. Thus there has been much recent interest in defining and studying ‘inhomogeneous’ random graph models.

In the lecture I shall describe several models introduced in the last decade, including the very general inhomogeneous models of sparse graphs Janson, Riordan and I have defined and studied. These models are closely connected to so-called convergent sequences of dense graphs introduced by Borgs, Chayes, Lovász, Sós, Szegedi and Vesztergombi, and their sparse counterparts that Riordan and I have defined.