Phase transitions of random graphs on a surface

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In the theory of random graphs the behaviour of the typical size of the largest component was studied a lot. We will compare well known results on the emergence and size of the giant component for Erdős-Rényi random graphs with recent results on random planar graphs and graphs chosen uniformly at random among all graphs embeddable on an orientable surface with fixed positive genus. For the latter case, there are interesting structural properties that cannot be observed either in Erdős-Rényi random graphs or in planar random graphs.