

The birth of the strong components

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Abstract: The $D(n, p)$ model produces a random directed graph on n vertices, where each of the $n(n-1)$ possible arcs is present with probability p . For large n , the typical structure of such a random directed graph depends on whether p is smaller than, around, or above the threshold $1/n$. We obtain precise results on this phase transition for the $D(n, p)$ model and other variants. Our work relies on analytic combinatorics (generating function manipulations), the saddle point method, and the analysis of generalizations of the Airy function. The full article is available on arXiv. This is joint work with Sergey Dovgal, Dimbinaina Ralaivaosaona, Vonjy Rasendrasina, and Stephan Wagner.