

Abstract Submitted  
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**Influence maximization in complex networks through optimal percolation** FLAVIANO MORONE, HERNAN MAKSE, City College of New York, CUNY COLLABORATION, CUNY COLLABORATION — The whole frame of interconnections in complex networks hinges on a specific set of structural nodes, much smaller than the total size, which, if activated, would cause the spread of information to the whole network, or, if immunized, would prevent the diffusion of a large scale epidemic. Localizing this optimal, that is, minimal, set of structural nodes, called influencers, is one of the most important problems in network science. Here we map the problem onto optimal percolation in random networks to identify the minimal set of influencers, which arises by minimizing the energy of a many-body system, where the form of the interactions is fixed by the non-backtracking matrix of the network. Big data analyses reveal that the set of optimal influencers is much smaller than the one predicted by previous heuristic centralities. Remarkably, a large number of previously neglected weakly connected nodes emerges among the optimal influencers. Reference: F. Morone, H. A. Makse, Nature 524,65-68 (2015)

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