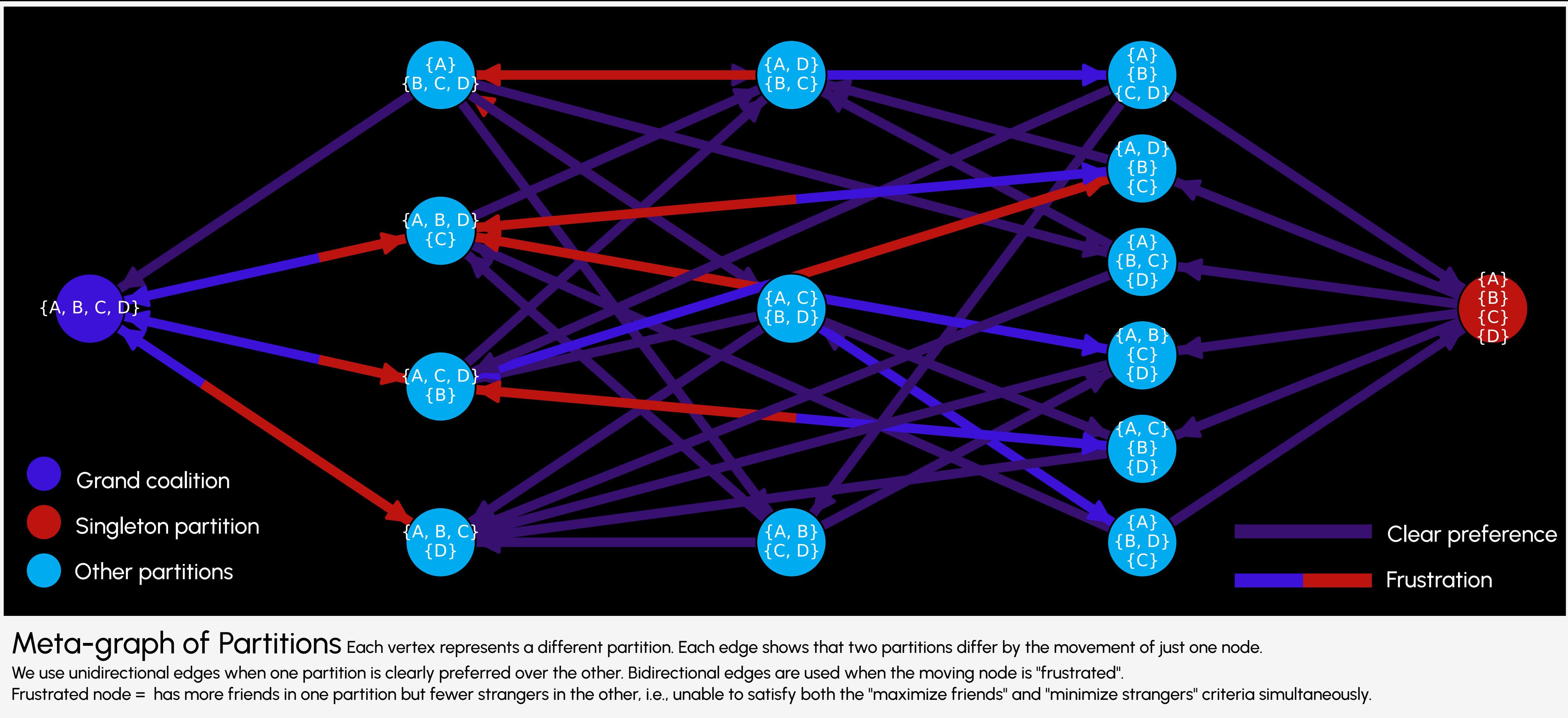
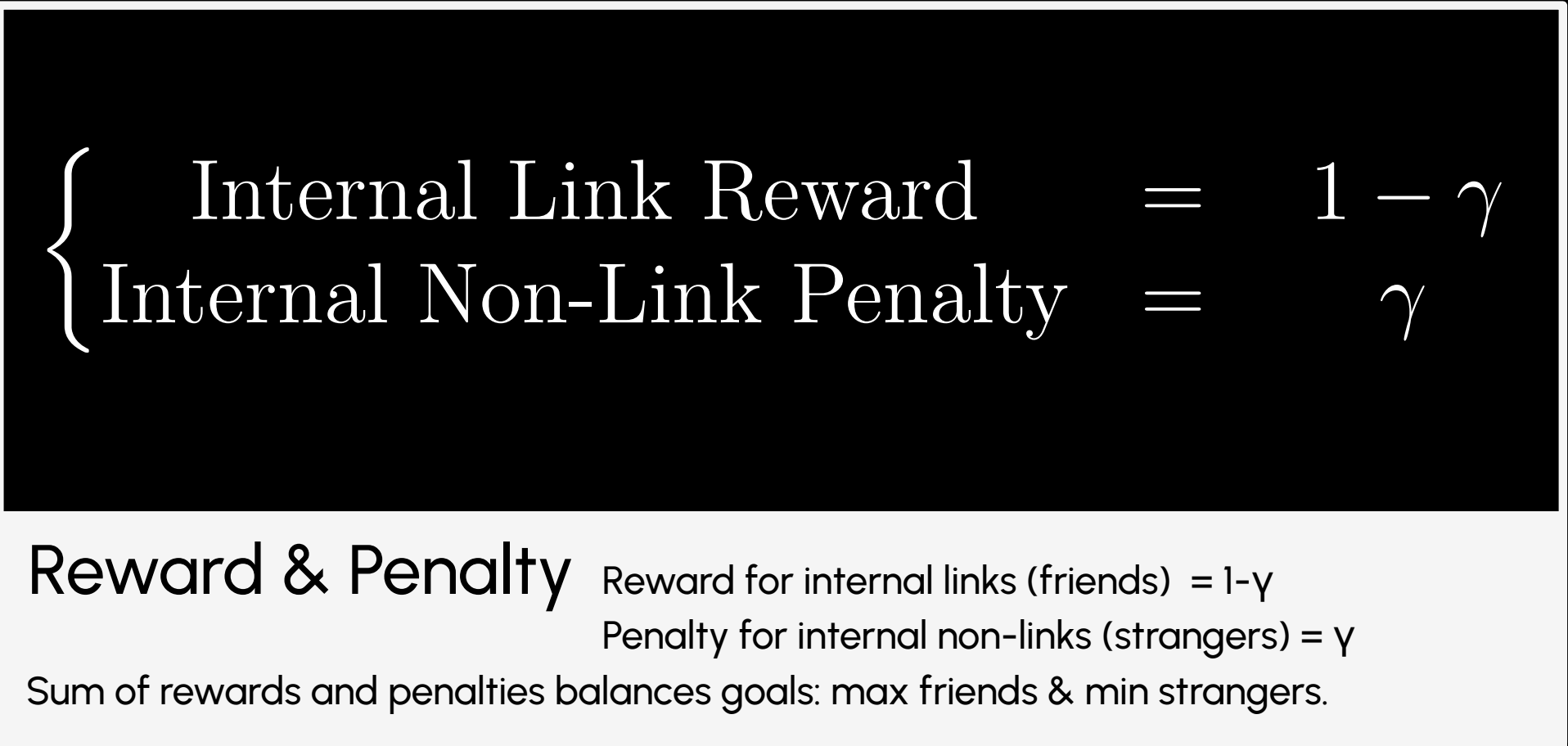
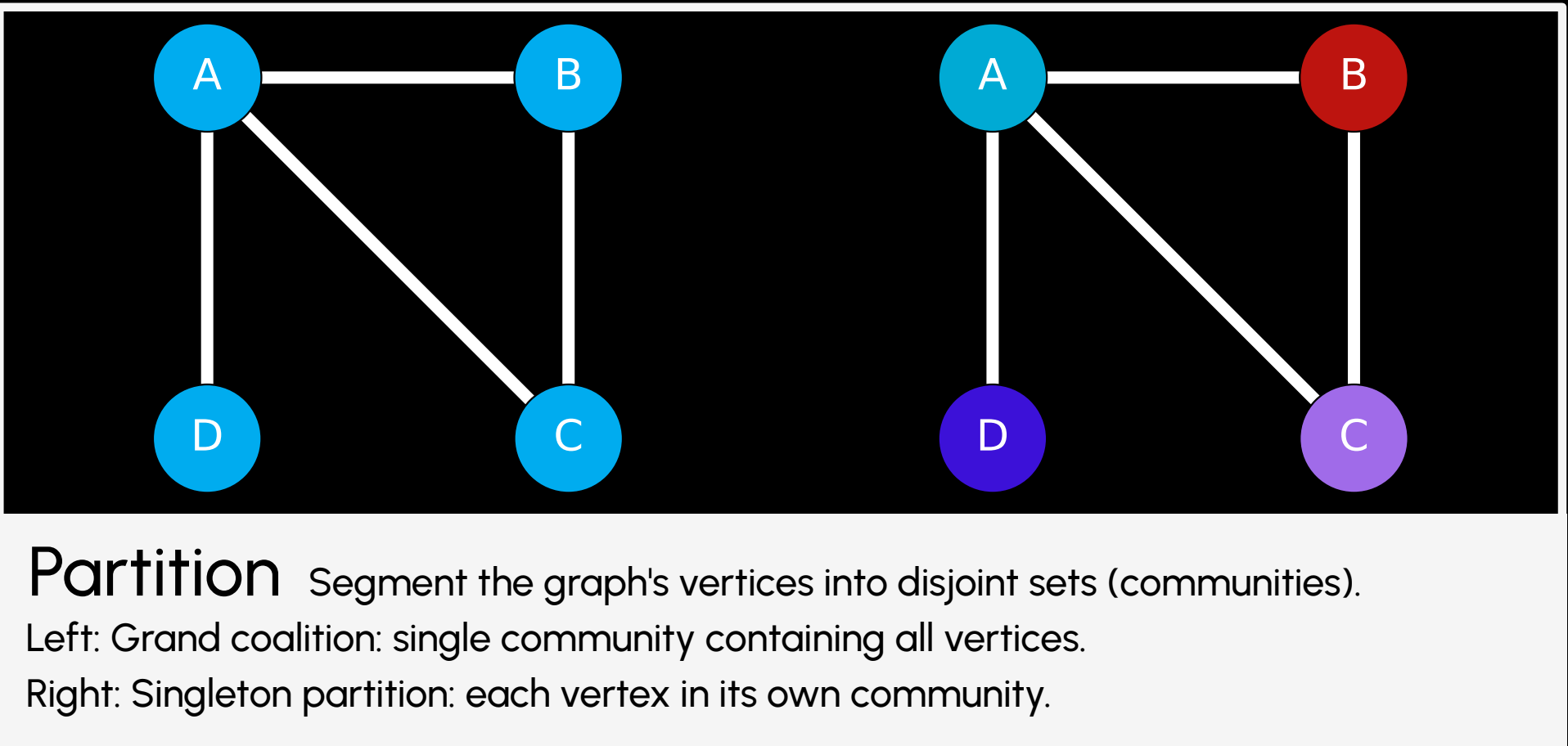


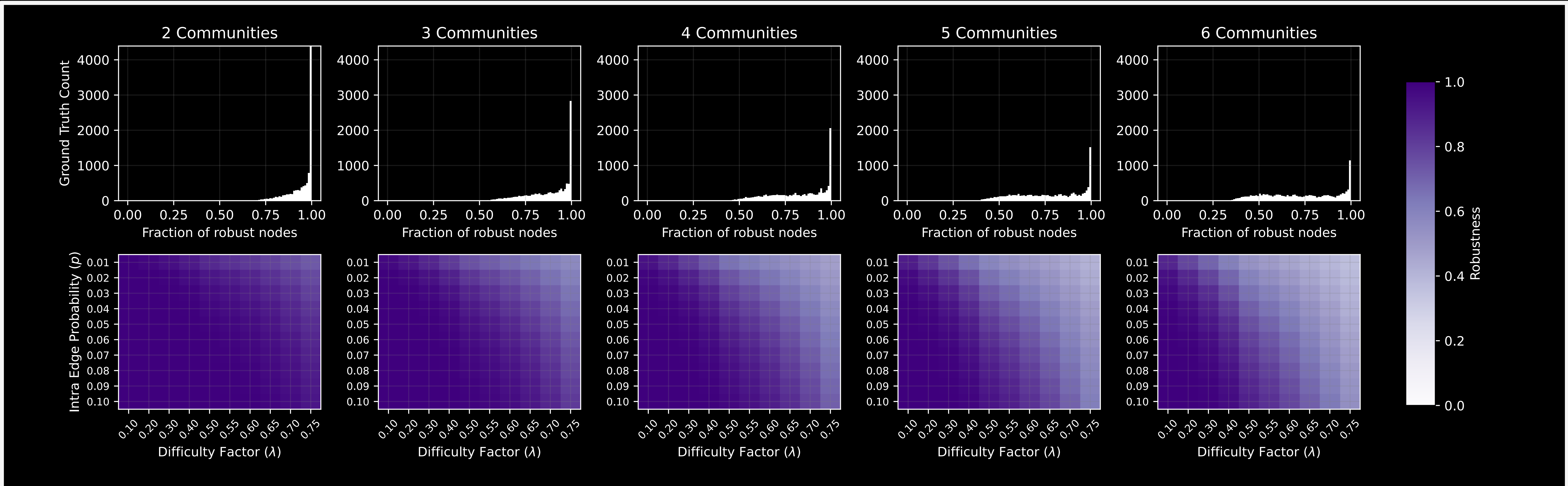
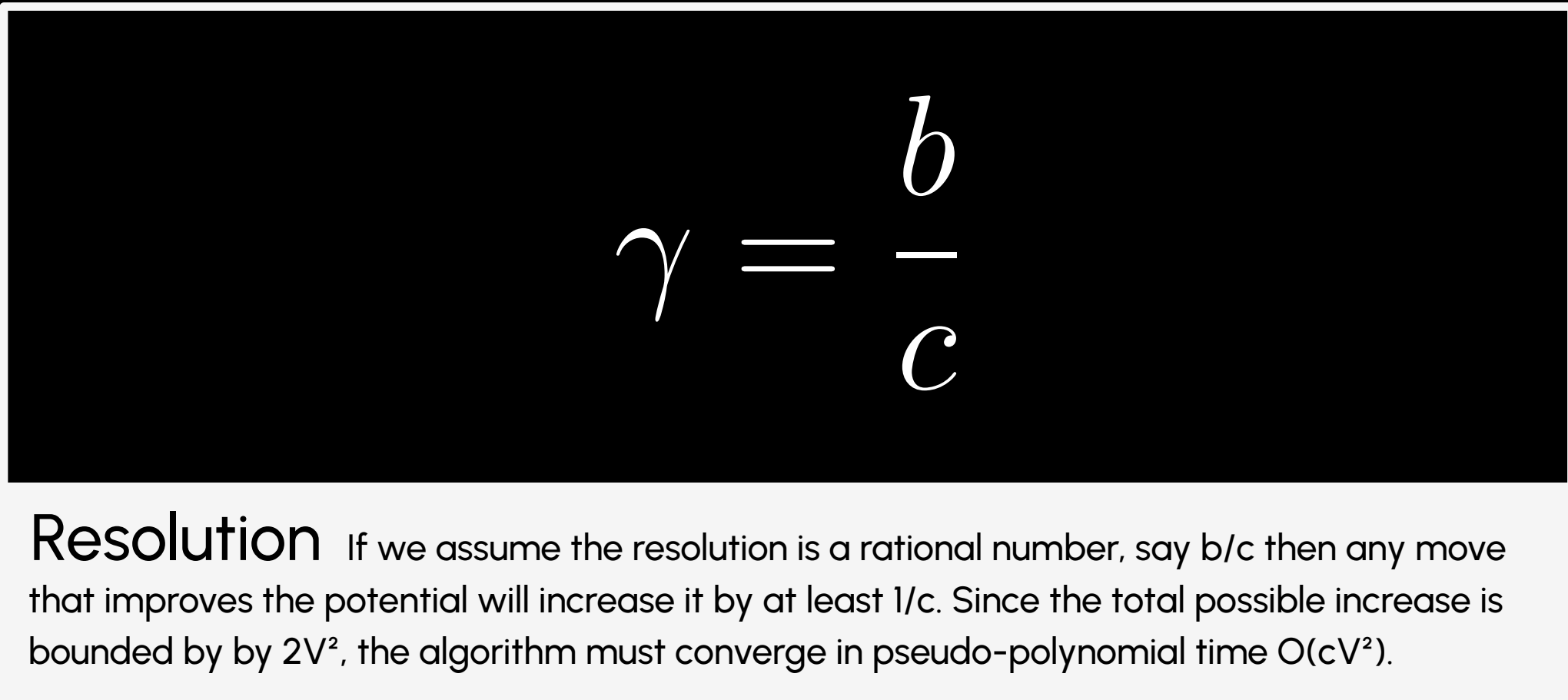
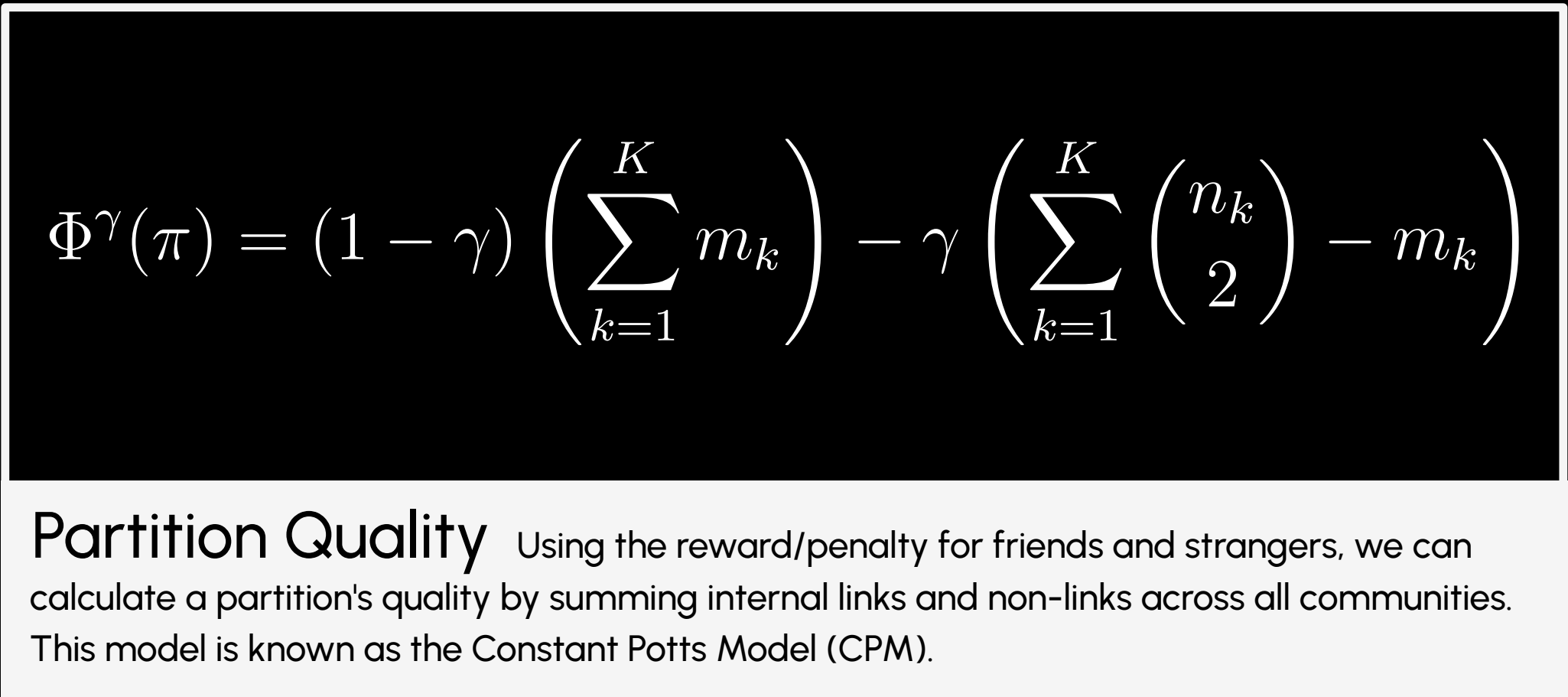
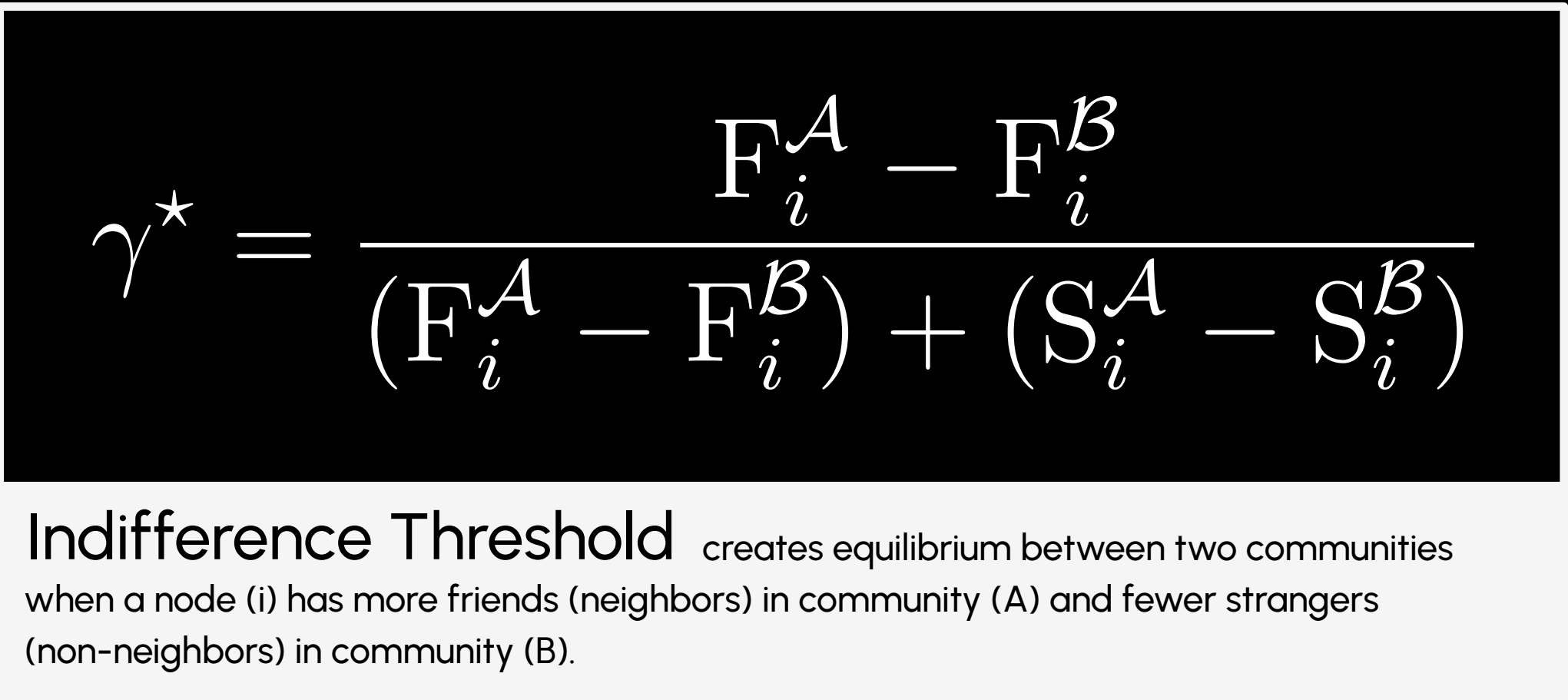
Robustness against Frustration in Community Detection

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Clustering groups similar items; community detection is network clustering



- 1) Equilibrium selection: How to select a partition among candidate solutions?
- 2) Equilibrium convergence: How many moves until find a candidate solution?



Robustness of Ground Truth Partitions Using synthetic networks generated with the Symmetric Assortative Planted Partition Model (SAPPM)—a special case of the Stochastic Block Model (SBM) where communities have an equal number of nodes and the probability of an internal link (p) is always greater than or equal to the probability of external links (q)—we can calculate the robustness of these "ground truth" partitions. This helps us verify if there's a correlation between robustness and accurate partitions. We've observed that for clearly defined partitions (either due to a high internal link probability (p) or a low "difficulty factor" ($\lambda=q/p$)), the ground truth partition is indeed robust. This suggests a positive correlation between accuracy and robustness.

CPM converges to robust partitions in pseudo-polynomial time!