

Final Honour School of Mathematics Part C

C5.4 Networks

Pick one of the following two broad topics, and write a report on a specific subtopic within that general heading. Your report must include at least some numerical simulations (which you produce) and must include salient discussions of modeling issues, random-graph ensembles, and empirical data.

1. Structure of networks (e.g., core-periphery, communities).
2. Processes on networks (e.g., spreading, synchronization, cascades).

Your report should be in the format and style of an article for the journal *Proceedings of the National Academy of Sciences*, and the main text must be no more than 6 typeset pages and must use their LaTeX style files (a template and style files will be provided). The report must include all sections (abstract, significance statement, etc.) in papers published in that journal (2017 format of papers). It is permissible to include a section of Supplemental Information that shows additional figures and calculations. In your report, indicate explicitly which ideas are new and which come from existing sources, and use appropriate and explicit attributions for all references (which must include papers reporting original research) or anything else (e.g., including code and figures) from other sources.

You need not submit scripts for any code you produce, but you may include them as part of Supplemental Information if you wish.

Your report need not contain original research results, though you must use some original research papers (not just review articles or books) as resources.