

# Well-quasi-ordering tournaments and Rao's degree-sequence conjecture

*Date* Tuesday, September 22

*Time* 3 pm

*Location* 303 Mudd

*Abstract:* In any infinite set of graphs, one of them is a minor of another (a theorem of Neil Robertson and the speaker). The same is not true if we use induced subgraphs instead of minors, but S. B. Rao conjectured in about 1980 that it is true for a tweaking of the induced subgraph relation. Let us say  $G$  "Rao-contains"  $H$  if there is a graph  $G'$  with vertex set  $V(G)$  and with the same vertex-degrees as  $G$ , such that  $G'$  contains  $H$  as an induced subgraph. Rao conjectured, and we have now proved, that in any infinite set of graphs one of them Rao-contains another.

The problem turns out to be related to ordering digraphs by immersion (vertices are mapped to vertices, and edges to edge-disjoint directed paths). Immersion is not a well-quasi-order for the set of all digraphs, but for certain restricted sets (for instance, the set of tournaments) we prove it is a well-quasi-order.

We sketch the connection between digraph immersion and Rao-containment, and the main ideas of the proofs.

This is joint work with Maria Chudnovsky.