On the genus of dense graphs

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Abstract

What is the smallest genus of a surface in which the complete graph K_n can be embedded? This question, known as the *Heawood problem*, was resolved in 1968 by Ringel and Youngs and its solution gave birth to topological graph theory. In the 1990s, Archdeacon and Grable and Rödl and Thomas proved that the genus of random graphs behaves very much like the genus of complete graphs.

The speaker will outline some recent results about genus embeddings of dense graphs building on the work outlined above. The work, which was originally motivated by algorithmic questions, uses modern notions of quasi-randomness and graph limits, and leads to interesting new problems in topological graph theory.

Substantial part of the talk will be based on recent joint work with Yifan Jing.