Combinatorics Seminar

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Equitably Colourable Combinatorial Designs

Abstract:

Suppose we have a BIBD(v, k, λ) in which the points are coloured with ℓ colours $c_1, ..., c_\ell$. A block B is *equitably ℓ-coloured* if B has n_i vertices coloured with colour c_i $(i = 1, ..., \ell)$ and $|n_i - n_j| \leq 1$ for any $i, j \in \{1, ..., \ell\}$. A design is *equitably ℓ-colourable* if the points can be coloured with ℓ colours such that every block is equitably ℓ-coloured. Here the associated spectrum problem is the problem of determining conditions on v such that an equitably ℓ-coloured (v, k, λ)-BIBD exists for fixed ℓ, k, and λ.
This problem was inspired by some recent research on equitably ℓ-colourable m-cycle decompositions of the complete graph.