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Additive Colourings of Graphs

The additive colouring problem is vertex version of the "1-2-3 conjecture" proposed by Karoński, Łuczak, and Thomason. In this problem the vertices of simple finite graph G are coloured with elements of an abelian additive group Γ, then we define weight of vertex as sum of colours of its neighbours. If weights of every two adjacent vertices are different we say that G is Γ-colourable. The main question we're trying to answer is whether there is an upper bound on the minimal order of group that can be used to colour graph of bounded chromatic number? In my talk I'll present questions and partial results concerning additive colourings of interesting graph classes - including bipartite, planar, product and Cayley graphs.

This is joint work with Jarosław Grytczuk and Sebastian Czerwiński.