

Speaker: Helge Tverberg

Affiliation: University of Bergen

Title: A Lovasz-type lemma, applied to Brooks' theorem for listcolouring

Abstract: In 1975 Lovasz gave a new non-algebraic proof of Brooks' theorem. He first proved a lemma, saying that under certain conditions a graph G has vertices a, b, c such that ab and ac are edges, but not bc , and $G - b - c$ is connected. One of the conditions is that G has no cutpoint. This condition can not be assumed to be satisfied by a minimal counterexample to Brooks' theorem for listcolouring however. Since Lovasz's lemma also gives an algebraic proof of Brooks' theorem, I therefore proved a similar lemma with different conditions, giving both algebraic and non-algebraic proofs in the listcolouring case. The stimulus here was a completely different algebraic proof by Kral et.al. in 2009.