STEPHEN FINBOW, St Francis Xavier

Hamiltonicity of Bell and Stirling Colour Graphs

For a given graph G the k- *Colour Graph* has been defined as the graph of colourings of G using k or fewer colours, where two colourings c_1 and c_2 are adjacent if they agree on all but one vertex of G. That is there is a vertex $v \in V(G)$ such that $c_1(x) = c_2(x)$ for all $x \in V(G)/\{v\}$. Each colouring of G induces an equivalence relation of the vertices. Specifically, for a colouring c, x is related to y if $c(x) = c(y)$. Since this is the way colourings are normally viewed, a more intuitive approach would perhaps be consider only the partitions induced by each of the colourings of G. That is define the k-*Bell Colour Graph*, $\mathcal{B}_k(G)$ from k-Colour Graph of G by identifying colourings c_1 and c_2 if $[x]_{c_1} = [x]_{c_2}$ for every $x \in V(G)$. The k-*Stirling Colour Graph* $\mathcal{S}_k(G)$, which is the subgraph of $\mathcal{B}_k(G)$ induced by the vertices in $V(\mathcal{B}_k(G)) - V(\mathcal{B}_{k-1}(G))$. This graph, $\mathcal{S}_k(G)$, is the graph of partitions of G induced by colourings using exactly k colours. We will discuss some results on the Hamiltonicity of k-Bell Colour Graphs and k-Stirling Colour graphs. This is joint work with G. MacGillivray.