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**David Galvin\*** (dgalvin1@nd.edu). *Maximizing colorings of a regular graph — results and questions.*

Alon speculated in 1991 that among all  $d$ -regular graphs, the ones that admit the most independent sets are the disjoint unions of complete bipartite graphs; this speculation was confirmed by Kahn in 2001 (for bipartite graphs) and Zhao in 2011 (in general).

With Tetali in 2004 we raised the more general question: for each  $H$ , which  $d$ -regular graphs admit the most  $H$ -colourings (adjacency-preserving maps to  $H$ )? There has been some recent progress — Sernau has a nice construction showing that a complete answer will be quite involved, and Cohen, Perkins and Tetali have settled the case when  $H$  is the Widom-Rowlinson graph (the completely looped path on three vertices).

In this talk I'll survey what we know and don't know about this question. (Received February 06, 2016)