

1024-05-174

**Baogang Xu** ([baogxu@njnu.edu.cn](mailto:baogxu@njnu.edu.cn)), School of Math. & Computer Science, Nanjing Normal University, 122 Ninghai Road, Nanjing, Jiangsu 210097, Peoples Rep of China, and **Xingxing Yu\*** ([yu@math.gatech.edu](mailto:yu@math.gatech.edu)), School of Mathematics, Georgia Institute of Technology, Atlanta, GA 30332. *Triangle-free subcubic graphs with minimum bipartite density.*

A graph is subcubic if its maximum degree is at most 3. The bipartite density of a graph  $G$  is  $\max\{|E(H)|/|E(G)| : H \text{ is a bipartite subgraph of } G\}$ . It is an NP-hard problem to determine the bipartite density of any given triangle-free cubic graph. Bondy and Locke gave a polynomial time algorithm which, given a triangle-free subcubic graph  $G$ , finds a bipartite subgraph of  $G$  with at least  $\frac{4}{5}|E(G)|$  edges; and showed that the Petersen graph and the dodecahedron are the only triangle-free cubic graphs with bipartite density  $\frac{4}{5}$ . Bondy and Locke further conjectured that there are precisely seven triangle-free subcubic graphs with bipartite density  $\frac{4}{5}$ . We prove this conjecture. The result is then used to solve a problem of Bollobás and Scott related to judicious partitions. (Received January 08, 2007)