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**Axel Brandt, Michael Ferrara, Mohit Kumbhat, Sarah Loeb, Derrick Stolee\***  
(dstolee@iastate.edu) and **Matthew Yancey**. *I,F-Partitions of Sparse Graphs*.

A *star  $k$ -coloring* is a proper  $k$ -coloring where the union of two color classes induces a star forest. While every planar graph is 4-colorable, not every planar graph is star 4-colorable. One method to produce a star 4-coloring is to partition the vertex set into a 2-independent set and a forest; such a partition is called an *I,F-partition*. We use a combination of potential functions and discharging to prove that every graph with maximum average degree less than  $\frac{5}{2}$  has an I,F-partition, which is sharp and answers a question of Cranston and West [A guide to the discharging method, arXiv:1306.4434]. This result implies that planar graphs of girth at least 10 are star 4-colorable, improving upon previous results of Bu, Cranston, Montassier, Raspaud, and Wang [Star coloring of sparse graphs, *J. Graph Theory* **62** (2009), 201-219]. (Received August 10, 2015)