1125-I1-881 **Douglas Dunham*** (ddunham@d.umn.edu), Department of Computer Science, University of Minnesota, Duluth, Duluth, MN 55812-3036, and **John Shier** (johnpf99@frontiernet.net), 6935 133rd Court, Apple Valley, MN 55124. *Creating Wallpaper Patterns that are Locally Random Fractals.* Preliminary report.

We show an algorithm for wallpaper patterns whose fundamental regions are filled with fractal patterns composed of progressively smaller copies of a motif (the basic subpattern). The motifs can be very simple or complicated. The local part of the algorithm begins by placing the largest copy of the motif at a random location in the fundamental region. After placing i motifs, the algorithm keeps trying random locations within the region at which to place the next motif until a location is found for which the new motif does not overlap any previously placed motif. Then i is incremented and this process is repeated. The sizes of the motifs obey an inverse power law which guarantees they will fill the fundamental region in the limit, though we stop after a finite number of successful placements.

The global part of the algorithm copies the contents of the fundamental about the Euclidean plane by using the transformations that generate the entire wallpaper pattern from the fundamental region. We have implemented this algorithm for the wallpaper groups $p1$, $p2mm$, $p4mm$, $p3m1$, $p6mm$, $p4$, and $p6$. We will show sample patterns. (Received September 12, 2016)