Wallpaper groups are a class of 17 distinct textures that resemble beautiful Victorian wallpapers and feature heavily in Islamic art. In each wallpaper group, unique combinations of symmetries tile the image plane, unlike the individual symmetries typically used in vision research. We show that the symmetry content of each texture is reflected in both brain activity and symmetry detection performance, indicating that the human brain encodes symmetries with a high level of precision. This opens new avenues for research on how symmetries in textures contribute to natural vision and might help explain the prevalence of symmetries in human artistic expression.

**OLD VERSION BELOW**

Wallpaper groups are a class of 17 distinct textures that resemble beautiful Victorian wallpapers, and together represent the complete set of possible symmetries in images. Each group has a unique combination of symmetries, and there are hierarchical relationships between groups based on the symmetries. We show that this hierarchy is reflected both in brain activity and symmetry detection performance. These findings expand our understanding of symmetry perception by showing that the human brain encodes symmetries with a high level of precision and detail. This opens new avenues for research on how representations of regular textures contribute to natural vision.