1062-57-134 **Brigitte Servatius*** (bservat@wpi.edu), Mathematical Sciences, WPI, Worcester, MA 01609-2280. *The Cube and its Petrie Dual embedded in* $\mathbb{R}^3$.

A graph G with a cellular embedding on a surface S has a well-defined geometric dual G^*, and both G and G^* can be drawn on S in a nice way so that the vertices/faces of G^* correspond to the faces/vertices of G.

The Petrie dual of G embedded on S does not change G, but replaces the faces of G on S with Petrie paths, so the graph G can be thought of as the intersection of two surfaces, S and S^P.

We ask if, given an embedding of the cube graph G in $\mathbb{R}^3$, which we think of as a wire frame, can we say what the corresponding natural surface is? Is it always the cube or can it be the Petrie dual of the cube, or can it be both? (Received August 03, 2010)