Meeting: 1003, Atlanta, Georgia, SS 9A, AMS-MAA-SIAM Special Session on Research in Mathematics by Undergraduates, I

1003-05-1519 **Ethan Berkove** (berkovee@lafayette.edu), Department of Mathematics, Lafayette College, Easton, PA 18042, **Jenna Hammang*** (jenna.hammang@valpo.edu), Valparaiso University, **Ben Hummon** (behummon@cs.vassar.edu), Vassar College, and **Joy Kogut** (kogut@simmons.edu), Simmons College. *The n-cubed cubes problem.*

The n-cubed (n^3) cubes problem is a problem of appropriate stacking. Start with a collection of cubes and a palette of six colors. Paint the cubes so that each cube face is one color, and all six colors appear in some order on every cube. Take n^3 cubes colored in this manner. When is it possible to stack these cubes into an $n \times n \times n$ large cube so that the faces on the large cube are each one color, and each color appears on a face of the large cube exactly once?

A team of three undergraduates worked on this problem at the Lafayette College Research Experience for Undergraduates during the summer of 2004. In this talk we will discuss the approach we took in solving this problem, using primarily techniques from combinatorics. It turns out that the larger the value of n, the easier it is to find a solution, and that the n^3 problem always has a solution for $n > 2$. (Received October 05, 2004)