1056-R1-410 **Andrew J Simoson*** (ajsimoso@king.edu), Andrew Simoson, King College, 1350 King College Road, Bristol, TN 37620. *In search of the big bubble.*

Air bubbles, as they cascade upwards underwater, often tend to collesce into a big bubble, whose upper part is the upper part of a sphere and whose lower part is a plane. Given a very simple model of the dynamics of water pressure—where the bubble's shape is determined by some convex combination of total force on the bubble's surface and the bubble's height for a given volume of air at a particular depth—we try to recreate such a bubble's shape by approximating this convex combination as a single expression involving n profile points at equally spaced depths. By solving the system of n partial derivatives set to zero, we can find the optimal shape of the bubble. Of course, to solve this sytem we use a computer algebra system—which provides a fun and powerful demonstration of solving a max/min problem in a Calculus III context. (Received September 04, 2009)