

Meeting: 1003, Atlanta, Georgia, MAA CP O1, MAA Session on Teaching and Assessing Problem Solving

1003-O1-564 **Richard J. Marchand*** (richard.marchand@sru.edu), Slippery Rock University, Department of Mathematics, 229 Vincent Science Hall, Slippery Rock, PA 16057, **Robert Rogers**, SUNY Fredonia, Fredonia, NY, and **Andrew Parker**, University of New Hampshire, Durham, NH.
Designing a Telescope Mirror. Preliminary report.

In the mid-90's, the Steward Observatory at the University of Arizona developed a technique for manufacturing large (8-meter class) primary mirrors for ground-based telescopes. Their innovative manufacturing process, called spincasting, involves melting glass in a rotating oven. As the glass melts, it takes on a paraboloidal shape. The focal ratio of the mirror is controlled by the angular velocity of the oven. The purpose of this presentation is to discuss an interdisciplinary application project for second semester calculus students that is used to analyze many aspects of this process. The project includes a number of modeling and problem solving exercises involving differential equations, kinetic energy, work, applications of integration, vector addition, and centripetal force. (Received September 22, 2004)