

# UNDERGRADUATE RESEARCH AND CREATIVE ACTIVITIES (URCA) COLLOQUIUM

*Mechanical Engineering major Tyler Rhodes participated in the 2012 URCA Colloquium on May 17, presenting a poster describing his research on morphable mold systems. Tyler was awarded Third Prize from the UCSB Emeriti Association for his research.*

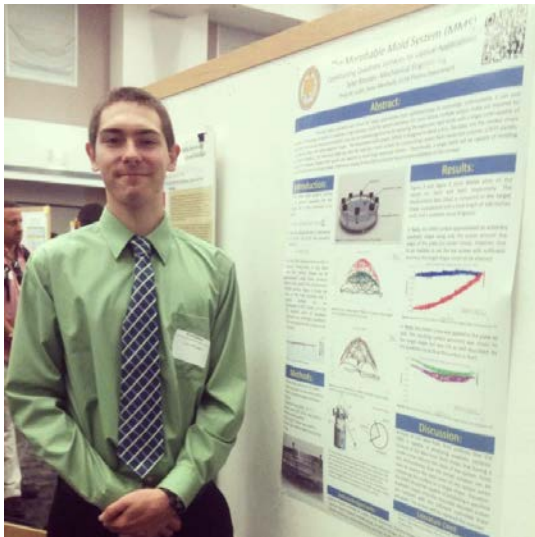
## Morphable Mold System

Tyler Rhodes

Faculty Mentor – P. Lubin

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Abstract - It can cost hundreds of thousands of dollars to machine a high precision mold for a quadratic surface. For cases where multiple unique molds are required for production, the cost can quickly become enormous. Cost can be reduced significantly by replacing the expensive rigid molds with a single mold that could morph its surface into every required quadratic shape.



The morphable mold system (MMS) is designed to bend a thin, flat plate into a quadratic shape using linear actuators. The deformed plate can then be used as a mold surface for constructing carbon-fiber-reinforced polymer (CRFP) panels. Hundreds of uniquely shaped CRFP panels are required to build large telescope mirrors. Theoretically, a single MMS will be capable of molding every CRFP panel into its proper shape.

### About URCA

*The mission of the Undergraduate Research and Creative Activities (URCA) Unit in the College of Letters and Science is to promote the scholarly work of undergraduate students and to provide resources for undergraduates to pursue independent research and creative activities under the guidance of faculty mentors.*