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RESEARCH ABSTRACT FORM

TITLE: Deployable Truss in a Near Space Environment

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The introduction of large scale structures in space is currently limited by the size of the transport vehicle as well as time and labor intensive assembly once in space. Accordingly, investigation of methods to facilitate further advancement of large scale structures in space is essential. One such method is the development of large scale trusses that can be stowed into a fraction of their size and launched into space. Once the vehicle reaches its intended destination, the truss can then be deployed and expanded to its full size.

The objective of this project is to design a three dimensional, unfolding truss using a shape memory polymer (SMP) composite material for the hinges. The truss will be launched to a near space environment, via a high altitude balloon (HAB). It will be launched in a folded state, of approximately 2 feet in length, to approximately 70,000 feet where it will be deployed by providing power to heating elements attached to each hinge. The heating of the hinges will cause them to revert to their original shape thereby extending the truss to approximately 10 feet.