

The Space Elevator

BRADLEY CARL EDWARDS

Eureka Scientific

Currently NASA and all space agencies are completely dependent on rockets to get into space. Several advanced propulsion systems are being examined by NASA and others, but few, if any, of these technologies, even if perfected, can provide the high-volume, low-cost transportation system that will be required for the future space activities mankind hopes for. A system that may have the required traits is the one that we examined in our Phase I, the space elevator. The space elevator, a cable that can be ascended from Earth to space, is unlike any other transportation system for getting into space. Our Phase I laid down the technical groundwork examining all aspects of a proposed first elevator, but was unable to test many of the designs and scenarios proposed. The hurdles were found and the technology requirements for the system quantified. Even we, the proposers, were surprised by the apparent feasibility of the space elevator, the availability of almost all of the required technology, and the affordability of the first elevator. Our Phase II effort is the critical next step. It will begin to answer many of the questions that remain, provide direction for future research and be crucial for future funding and programmatic decisions. In Phase II we will construct cable segments from carbon nanotube composites and test their general characteristics as well as their resistance to meteor and atomic oxygen damage. We will examine critical aspects of the space elevator design such as the anchor and power beaming systems, cable production, environmental impact, the budget and the major design trade-offs. Our previous work along with our Phase II results will then be introduced into the NASA mainstream effort through a conference and publication.

