

Dr. Jordin T. Kare
Kare Technical Consulting
Modular Laser Launch Architecture: Analysis and Beam Module Design

The modular laser launcher is a new concept for laser launch in which the laser source consists of a large number -- hundreds or thousands -- of self-contained, ground-based "beam modules," each of which transmits a relatively small amount of power to a laser-powered rocket vehicle. Compared to other launch technologies, including other laser launch concepts, a modular laser launcher is very inexpensive to develop, since the beam module is small and the development cost is amortized over many units. A modular launcher is potentially inexpensive to build, since the beam modules can be mass produced. It is inherently scaleable, and can be incrementally expanded simply by adding beam modules. It can seamlessly incorporate improved components or new technologies as they become available. A modular launcher is also inherently reliable and easy to maintain, since failure of any single module has no effect on the system operation. The modular launcher concept, combined with the inherently simple and flexible heat-exchanger rocket, makes possible a unique end run around primary roadblock for new launch technology: the high cost of simply proving a concept will work. In this Phase I effort we will analyze the performance requirements and scaling of modular laser launchers using various current and proposed laser technologies, develop baseline designs for possible beam modules, and define a roadmap for technology development and deployment of a modular laser launch system.

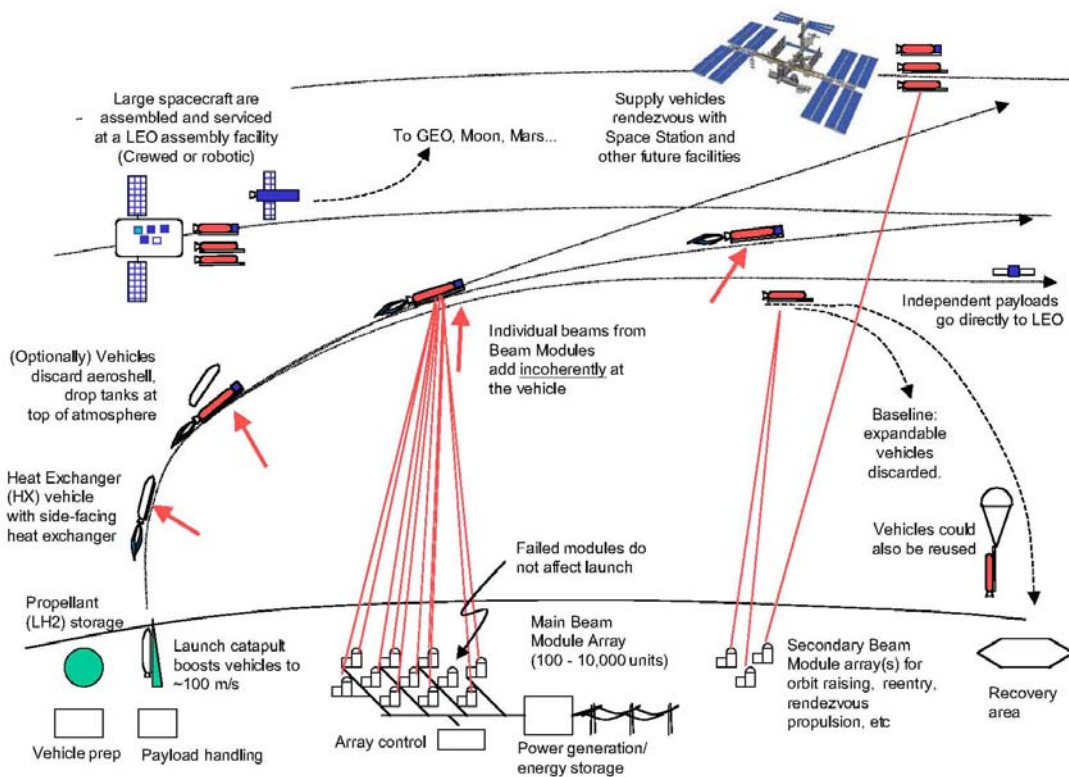


Figure 1: Laser Launch Architecture With Modular Ground-Based Laser Array