Moonbeam - Beamed Lunar Power

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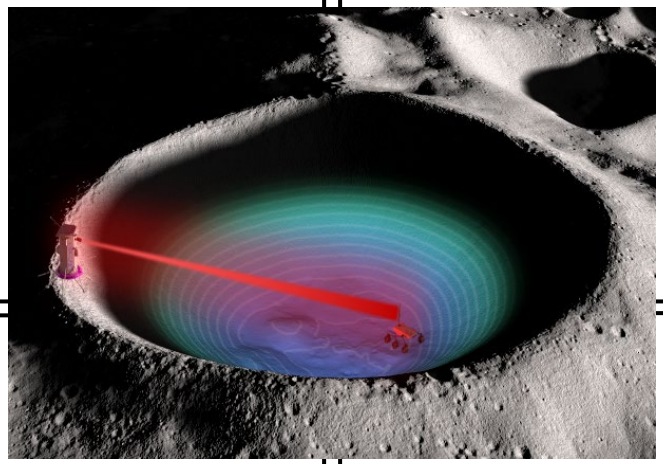
Boeing/ Spectrolab *(LPV + space qual. capable)*
Intuitive Machines *(IM) (future lunar demo/ mission dev.)*
nLight *(high eff. low mass sources/ space qual. capable)*

Development Objective

Development will include:

(1) the development of a high-efficiency low mass laser and laser PV converter, including thermal management
(2) *the design and construction of a high-fidelity laboratory demonstration system, including a 4π beam director and a fine pointing system using a 3D-printed fiber actuator for target locking, capable of field use and extendable to flight, and* ***(3)*** *a full >100W$_e$ test.*



Approach

Our Directed Energy (DE) technology is compact, modular, scalable, efficient and readily scalable for a wide variety of lunar applications. The use of fiber-coupled lasers operated in either single mode or multi-mode combined with tunable laser photoconverters (LPV) can achieve ~20% overall end-to-end efficiency over scales far exceeding 1km. In addition, thermal batteries will be developed to store waste heat of energy not converted to electrical energy, allowing nearly 100% conversion efficiency at the receiver for electrical and thermal energy combined.

Impact and Fusion

Project Moonbeam will develop 1W-1kW test options which will ultimately enable PSR exploration with multiple rovers over long ranges (>1km). The same core DE technology can also be used for a variety of other lunar applications including LIDAR, active illumination imaging, standoff ablation studies of lunar molecule composition, including surface and sub-surface ice. This ultimately amounts to the beginning of the path to much larger scale lunar beamed power for assets functioning during the lunar night.