

## NASA SBIR/STTR Technologies

Proposal No. 06-2 X4.02-9046 - Multi-Use Solar Thermal System for  
Oxygen Production from Lunar Regolith - Contract No. NNJ08JD44C

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### Identification and Significance of Innovation

- Solar radiation is collected by the concentrator array
- Optical waveguide cable transmits the solar thermal power to the oxygen production reactor
- High intensity solar radiation provides thermal power at temperatures necessary for oxygen production process
- Scale-up can be implemented by increasing the number and the size of the concentrator

Expected TRL Range at the end of Contract (TRL = 6)



Engineering Prototype Optical Waveguide Solar Thermal System

### Technical Objectives and Work Plan

- Develop a prototype optical waveguide solar thermal system and demonstrate its capability in a test site which simulates the lunar environment
- Identify technology issues and establish pathway for future space-based system

Task-1: Develop an engineering prototype solar thermal system

Task-2: Conduct oxygen production tests with the carbothermal reactor

Task-3: Improve key components

Task-4: Develop a thermal power source for additional 1 kW thermal power to the carbothermal reactor

### NASA and Non-NASA Applications

- Production of oxygen and other materials on the lunar surface
- Thermal processing of in-situ lunar materials
- Thermal-to-electric power generation
- Transportable solar heat source for terrestrial material processing and electric power generation

### Firm Contacts

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**NON-PROPRIETARY DATA**