

# NASA SBIR/STTR Technologies

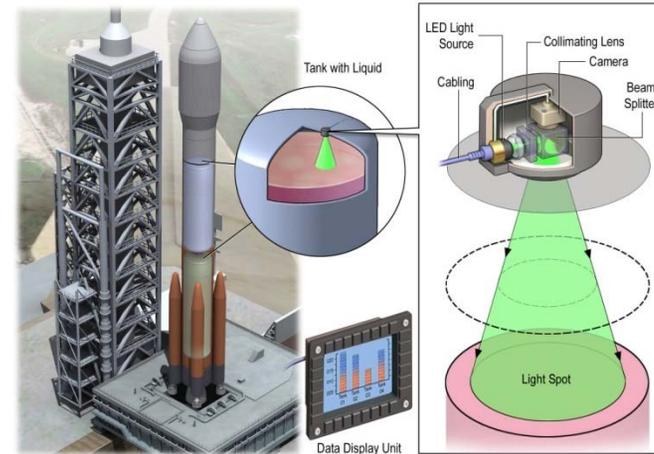
## Luminit Optical Tank-level Sensing system

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Proposal No. •



### Identification and Significance of Innovation

To address the NASA need for innovative methods to measure liquid propellant tank volume and fluid level with improved accuracy, repeatability, and minimal tank entries for maintenance and calibration, Luminit, LLC proposes to develop a new non-contact Luminit Optical Tank-level Sensing system (LOTS), based on the optical measurement of a small spotlight shone on the surface of the liquid. This approach incorporates commercial off-the-shelf components and Luminit cryogenic opto-mechanical design, which enables us to meet NASA requirements and offers the possibility of remote operation and compact size. In Phase I, Luminit will demonstrate the feasibility of accurate measurement of the cryogenic liquid level. In Phase II, Luminit will build a functional prototype. The demonstrated results will offer NASA the opportunity to replace current multiple float switches and differential pressure measurements, which do not provide accurate liquid level measurements for low density fluids such as, e.g., liquid hydrogen.



### Technical Objectives

- Analysis and Design of the Optical Liquid Level Sensor
- Optimization and Homogenization of the Light Spot Shape on the Surface of the Liquid
- Development of Software for Calibration and Display
- Fabrication, Assembly, and Testing of LOTS Components
- Exploration of Commercial Potential for LOTS

### Work Plan

- Design LOTS Optics to Meet Sensitivity and Accuracy Requirements
- Design Illumination Module
- Design and Make Mechanical Package for the System
- Develop Algorithms for Calibration and Data Display
- Assemble and Test LOTS
- Demonstrate Feasibility of LOTS
- Explore Commercial Potential and Product Viability
- Prepare and Submit Reports

### NASA Applications

LOTS will be used in NASA facilities to provide accurate measurements of LH<sub>2</sub>.

### Non-NASA Applications

- Oil and petroleum industry
- Railway transportation tanks
- Military and commercial Ship tanks

### Firm Contacts

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