

## NASA SBIR/STTR Technologies



### A Novel, Portable, Projection, Focusing Schlieren System

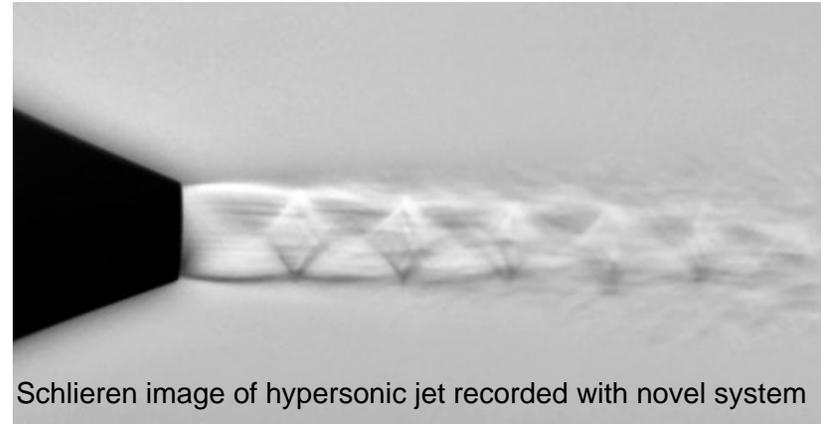
Proposal No. A4.01-8856, Contract No. NNX10CE88P

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#### Identification and Significance of Innovation

We are developing a novel type of large field-of-view schlieren camera system that is more portable, easier to align, and more versatile than existing systems. The system projects a background grid upon a reflective screen, and an image of the background grid is focused on a cutoff grid to produce the schlieren effect. Alignment between the screen and the camera is not critical, which simplifies the setup.

Expected TRL Range at the end of Contract (1-9): 6



Schlieren image of hypersonic jet recorded with novel system

#### Technical Objectives and Work Plan

The primary objective of this project is to build a portable, adjustable instrument that can be used to obtain high-speed schlieren images and video of airflows that are of interest to the aerospace community. Key features are the ability to look at different fields of view, and selectively focus on limited depths of two-dimensional slices of a flow.

We will build two prototype systems that will be improved versions of the Phase 1 breadboard system. At the 50% point of the program, we will demonstrate one system and deliver it to NASA. During the second half of the program, we will upgrade the second prototype to incorporate new capabilities – for example, high speed video, greater automation, or a larger field of view.

#### NASA and Non-NASA Applications

Applications exist in all forms of research and development associated with flow fields where schlieren viewing could be useful, including aero-optics, flow control, drag, boundary layer transition, and flow separation. The proposed developments could be extremely important in enhancing ground test facility capability. Potential commercial applications include flow diagnostics of heating and ventilations systems.

#### Firm Contacts

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**NON-PROPRIETARY DATA**