ANVIK

NASA SBIR/STTR Technologies

Microdischarge Array Flexible Light Source for High-Efficiency Irradiation of Space-Based Crops

PI: Marc Zemel / Anvik Corporation – Hawthorne, NY / Proposal Topic No: B3.07

Identification and Significance of Innovation

- Use microdischarge arrays built on flexible substrates for crop irradiation
- Microdischarge arrays offer high brightness (10^5 lm/pixel), high efficiency, and easy tailoring of the emission spectra to maximize the rate of photosynthesis
- The arrays can be made on flexible substrates at low-cost using Anvik's large-area patterning technology
- The arrays are lightweight, can be solar-powered, and can be easily integrated into space structures

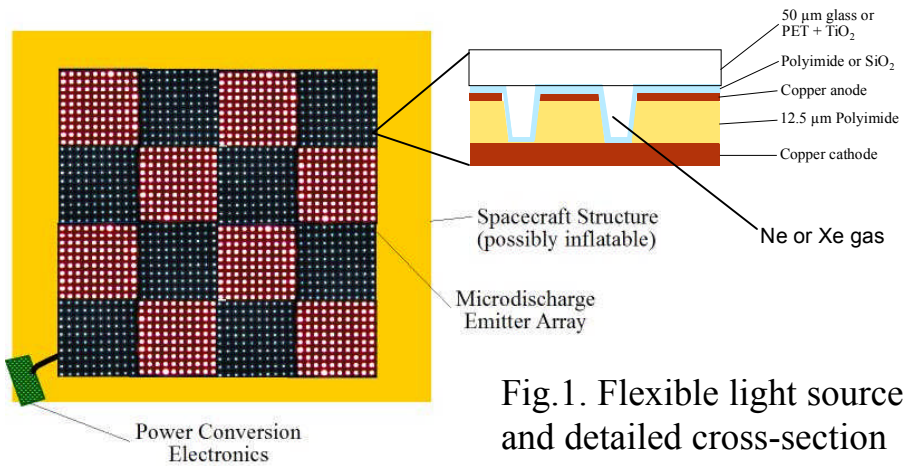

Fig.1. Flexible light source and detailed cross-section

Technical Objectives and Work Plan

We will team with Prof. J. Gary Eden of the University of Illinois, who first developed the microdischarge array technology.

Tasks	Months 1	2	3	4	5	6
Base Program						
1. Design the large-area, high-efficiency, flexible light source powered by photovoltaics.						
2. Evaluate and select gaseous emitter combinations.						
3. Optimize the microcavity and array design.						
4. Develop the large-area, high-efficiency light source fabrication process.						
5. Fabricate prototype microdischarge arrays on large, flexible sheets.						

NASA Applications

- Artificial lighting for space-based greenhouses
- Interior lighting of spacecraft and space stations

Non-NASA Applications

- LCD backlighting
- Large-area UV curing
- Photodynamic therapy
- Decorative lighting
- UV disinfection
- Portable lighting

Firm Contacts

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