

Foldable Compactly Stowable Extremely High Power Solar Array System, Phase I Project

SBIR/STTR Programs | Space Technology Mission Directorate (STMD)



ABSTRACT

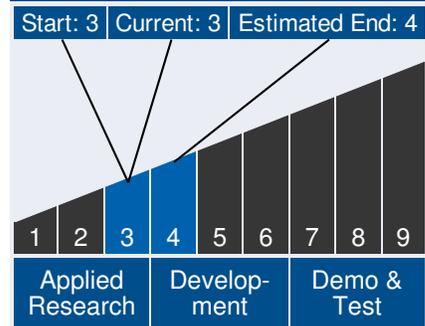
Deployable Space Systems, Inc. (DSS) has developed a high performance solar array system that has game-changing performance metrics in terms of ultra-compact stowage volume and extremely high specific power. The embodiment is a tensioned membrane blanket solar array that stows very compactly by folding, where it's total stowed height is only half the width of the deployed array, alleviating any stowed height restrictions and allowing for the packaging of enormous solar arrays within standard launch vehicle fairings. This innovation of extremely compact stowed packaging allows for much higher power to be packaged into a given stowed envelope, enabling significantly higher powered NASA/Non-NASA missions, and particularly enabling missions where stowed volumes are significantly constrained. The technology is also well suited for very large (extremely high power) SEP and non-SEP solar array systems where stowed packaging the greatest amount of power within a given enveloped is demanded. The proposed solar array technology innovation is reliable and leverages proven heritage components, materials, and approaches to provide very low risk implementation for the end-user. The proposed technology will produce revolutionary array-system-level performance in terms of ultra-compact stowage volume, high specific power, lightweight, reliability, modularity, adaptability, and affordability. The proposed technology also has many rapid commercial infusion paths to help maximize NASA's ROI.



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Technology Maturity



ANTICIPATED BENEFITS

To NASA funded missions:

Potential NASA Commercial Applications: NASA space applications are comprised of practically all Exploration, Space Science, Earth Science, Planetary Surface, and other missions that require affordable high-efficiency photovoltaic power production through of an ultra-lightweight, ultra-compact stowage, and highly-modular solar array system. The technology

Management Team

Program Executives:

- Joseph Grant
- Laguduva Kubendran

Program Manager:

- Carlos Torrez

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is particularly suited for advanced spacecraft that require high power / high voltage solar array arrays that require game-changing compact stowed packaging. The technology is suitable for NASA LEO, MEO & GEO, and interplanetary missions. The technology is also well suited for applications requiring scalability/modularity, operability within high radiation environments, high voltage operation, and operation in LILT and HIHT environments.

To the commercial space industry:

Potential Non-NASA Commercial Applications: Non-NASA space applications are comprised of practically all missions that require affordable high-efficiency photovoltaic power production through deployment of an ultra-lightweight, ultra-compact stowage, and highly-modular solar array system. Potential non-NASA commercial and DoD applications span a broad range of high voltage/power applications that demand ultra-compact stowage. The technology is suitable for non-NASA LEO, MEO & GEO missions. The technology is particularly suited for missions that require game-changing performance in terms of affordability, ultra-lightweight and compact stowage volume.

Management Team *(cont.)*

Principal Investigator:

- Brian Spence

Technology Areas

Primary Technology Area:

Space Power and Energy Storage (TA 3)

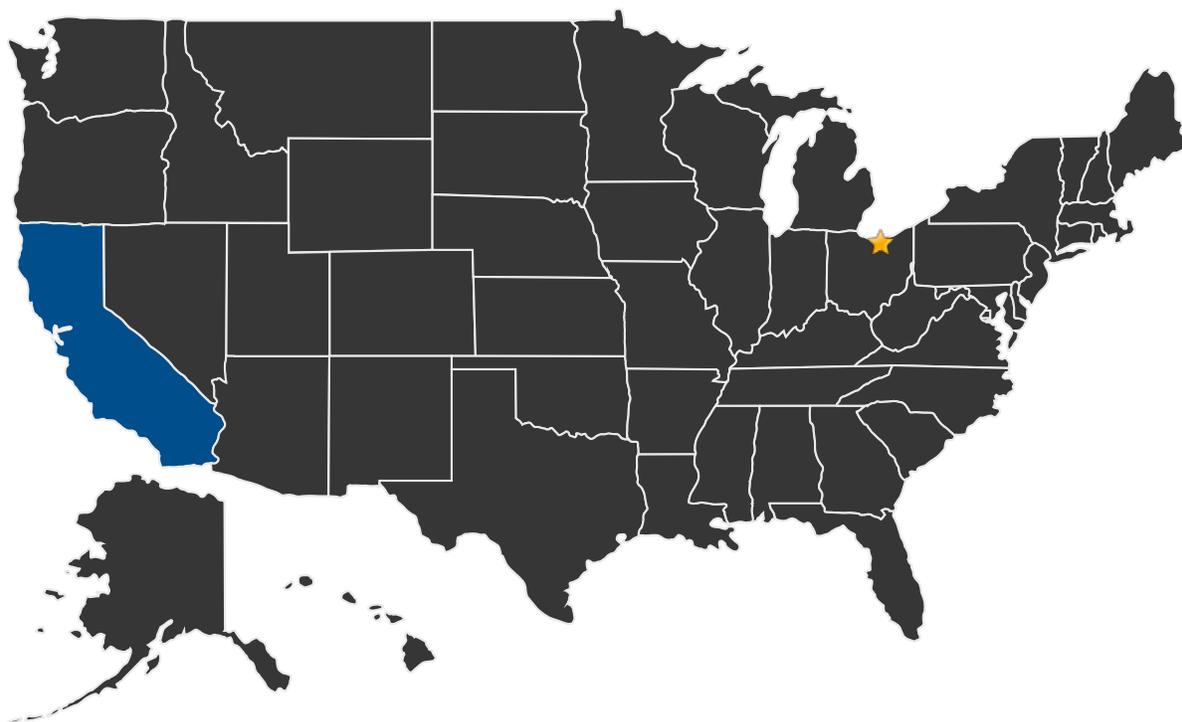
- └ Power Generation (TA 3.1)
 - └ Solar (TA 3.1.3)

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U.S. WORK LOCATIONS AND KEY PARTNERS



- U.S. States With Work ★ **Lead Center:**
Glenn Research Center

Other Organizations Performing Work:

- Deployable Space Systems, Inc. (Goleta, CA)

PROJECT LIBRARY

Presentations

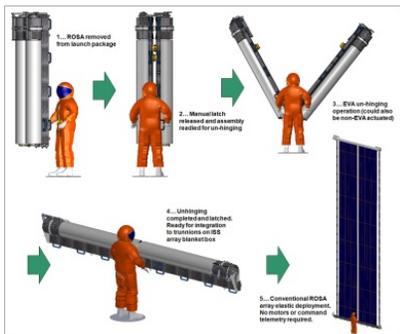
- Briefing Chart
 - (<http://techport.nasa.gov:80/file/23541>)

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IMAGE GALLERY



*Foldable Compactly Stowable
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System, Phase I*

DETAILS FOR TECHNOLOGY 1

Technology Title

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Potential Applications

NASA space applications are comprised of practically all Exploration, Space Science, Earth Science, Planetary Surface, and other missions that require affordable high-efficiency photovoltaic power production through of an ultra-lightweight, ultra-compact stowage, and highly-modular solar array system. The technology is particularly suited for advanced spacecraft that require high power / high voltage solar array arrays that require game-changing compact stowed packaging. The technology is suitable for NASA LEO, MEO & GEO, and interplanetary missions. The technology is also well suited for applications requiring scalability/modularity, operability within high radiation environments, high voltage operation, and operation in LILT and HIHT environments.