

## **Spectrolab Terrestrial Concentrator Solar Cell Achieves Unparalleled Solar Energy Conversion**

### **Spectrolab Terrestrial Concentrator Solar Cell Achieves Unparalleled Solar Energy Conversion**

---

Spectrolab, Inc., a subsidiary of The Boeing Company [NYSE: BA], has achieved an unprecedented conversion efficiency for a terrestrial concentrator solar cell.

Using concentrated sunlight, these photovoltaic (PV) cells can convert 36.9 percent of the sun's energy to electricity, a technology capability that could dramatically reduce the cost of generating electricity from solar energy.

Spectrolab's achievement is a necessary step to achieve one of the U.S. Department of Energy's major PV initiative goals, to develop solar modules that convert more than 33 percent of the sun's energy into electricity as targeted in the High Performance PV Project.

"The modified cell design better suits the terrestrial solar spectrum and opens the path for higher performance terrestrial concentrators" said David Lillington, president of Spectrolab. "And because the terrestrial cell we have developed is similar to our conventional space cells, it can be implemented in production, and manufactured in very high volumes with minimal impact to production flow."

Spectrolab uses these state-of-the-art solar cells in concentrator modules of various sizes and power-generating capabilities. Several modules are already being tested throughout the world by PV concentrator system manufacturers.

A significant advantage of concentrator systems is that fewer solar cells are required to achieve a specific power output, thus replacing large areas of semiconductor materials with relatively inexpensive optics that provide optical concentration. The slightly higher cost of multijunction cells is offset by the use of fewer cells. Due to the higher efficiency of multijunction cells used in the concentrator modules, only a small fraction of the cell area is required to generate the same power output compared to crystalline silicon or thin-film flat-plate modules.

The terrestrial solar cell is a modified version of Spectrolab's Improved Triple Junction (ITJ)space solar cell.

"There is considerable synergy between space and terrestrial cells, and improvements in space cells are expected to drive efficiency improvements for terrestrial cells. During the last few years, multijunction solar cells have doubled the power output of large commercial satellites, and substantially improved their revenue-generating capability. We believe that further optimization of the improved terrestrial concentrator cells will yield the potential to surpass 40 percent conversion efficiency," said Dr. Nasser Karam, Spectrolab vice president for Advanced Technology.

Terrestrial solar cells will also be the driving force to reduce the cost of materials used in space and terrestrial applications. This will add to the economic attractiveness of multijunction solar cell technology both for high power space satellites and large terrestrial systems.

The terrestrial concentrator cell, measuring approximately one-quarter of a square centimeter in area, was fabricated and tested at Spectrolab and then re-measured at the National Renewable Energy Laboratory (NREL), located in Golden, Colorado. NREL is the U.S. Department of Energy's premier laboratory for renewable energy and energy efficient research, development and deployment. Development of the device technology embodied in the record efficiency multijunction cell was funded in part by NREL, in part by the Air Force Research Laboratory (AFRL) and by Spectrolab.

Spectrolab, founded in 1956, has been supplying solar cells and panels to the space industry for 40 years. Spectrolab is headquartered in Sylmar, Calif., a suburb of Los Angeles. It also is a leading supplier of searchlights and solar simulators. Visit Spectrolab's website at [www.spectrolab.com](http://www.spectrolab.com).

The Boeing Company is the world's leading aerospace company, with its heritage mirroring the history of flight. It is the largest manufacturer of satellites, commercial jetliners and military aircraft. The company is also a global market leader in missile defense, human space flight and launch services.

###

SPECTROLAB, INC.  
Public Relations Department  
P.O. Box 92919 (S10/S323)  
Los Angeles, CA 90009

For further information:  
Spectrolab, Inc.  
Public Relations Department  
(310) 364-6363

---