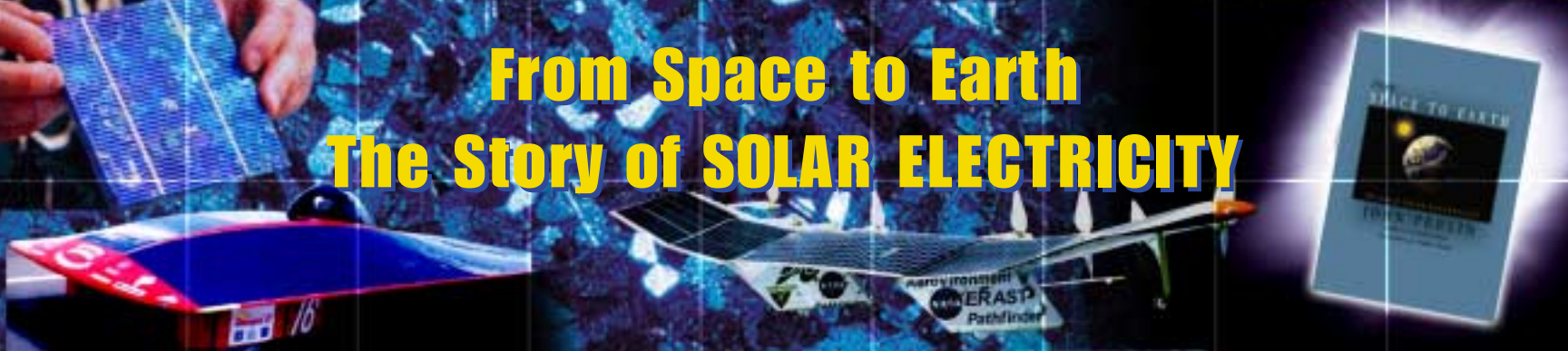


# From Space to Earth The Story of SOLAR ELECTRICITY



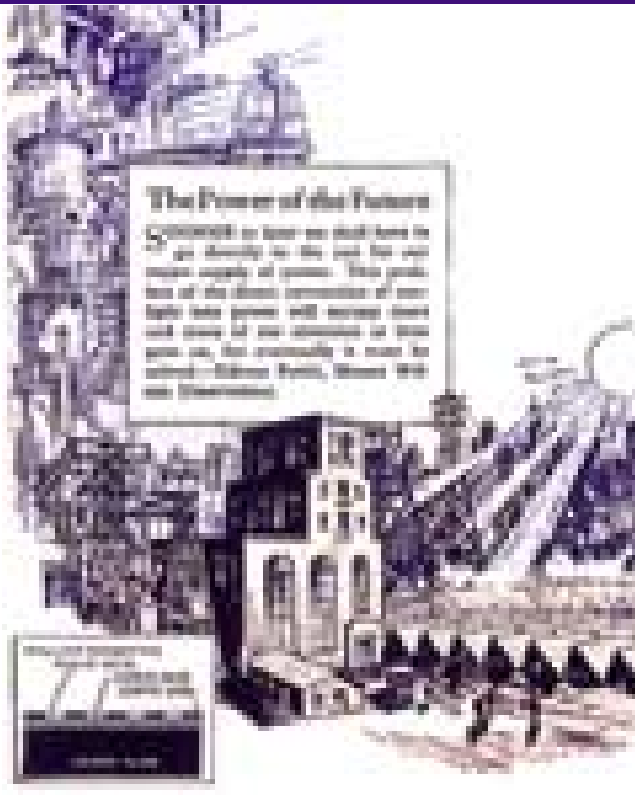
## Photovoltaics: The Great Solar Hope

If there is a dream technology, it is photovoltaics—solar cells, made of material thinner than a human hair, that convert sunlight directly into electricity without any moving parts. Photovoltaics is a space age marvel, at once the most sophisticated solar technology and the simplest, most benign source of energy yet conceived.



Courtesy of NASA/JPL/Caltech

©Popular Mechanics, 1932



## Photovoltaic Dreams

People have long dreamed of developing photovoltaics for practical purposes as this image from a 1932 issue of *Popular Mechanics* demonstrates.

## The Dream Becomes Real

Bell scientists realized the dream in 1954, discovering the silicon solar cell, the first solar cell to produce enough electricity for useful purposes, and still the workhorse of the photovoltaic industry. This ad, appearing in the August, 1954 issue of *National Geographic*, celebrates the breakthrough.



**SIMPLE AND EFFICIENT**—The Bell Solar Battery is made of thin, specially treated strips of silicon, an eight-thousandth of an inch wide. It needs no fuel other than the light from the sun itself. Since it has no moving parts and nothing is consumed or destroyed, the Bell Solar Battery should theoretically last indefinitely.

### New Bell Solar Battery Converts Sun's Rays Into Electricity

**Bell Telephone Laboratories demonstrate new device for using power from the sun**

Scientists have long searched for the secret of the sun. For they have known that it sends us nearly as much energy daily as is contained in all known sources of coal, oil and uranium.

If this energy could be put to use there would be enough to turn every wheel and light every lamp that mankind would ever need.

Now the dream of the ages is closer to realization. For one of the Bell Telephone Laboratories has come the **Bell Solar Battery**—a device to convert energy from the sun directly and efficiently into usable amounts of electricity.

Though much development remains to be done, this new battery gives a glimpse of future progress in many fields. Its use with transistors (also invented at Bell Laboratories) offers many opportunities for improvement and economies in telephone service.

A small **Bell Solar Battery** has shown that it can send voices over telephone wires and operate low power radio transmitters. Made to cover a square yard, it can deliver enough power from the sun to light an ordinary reading lamp.

Great benefits for telephone users and for all mankind will come from this forward step in harnessing the limitless power of the sun.

BELL TELEPHONE SYSTEM



Photo courtesy of the AT&T Archives. Reprinted with permission of AT&T.

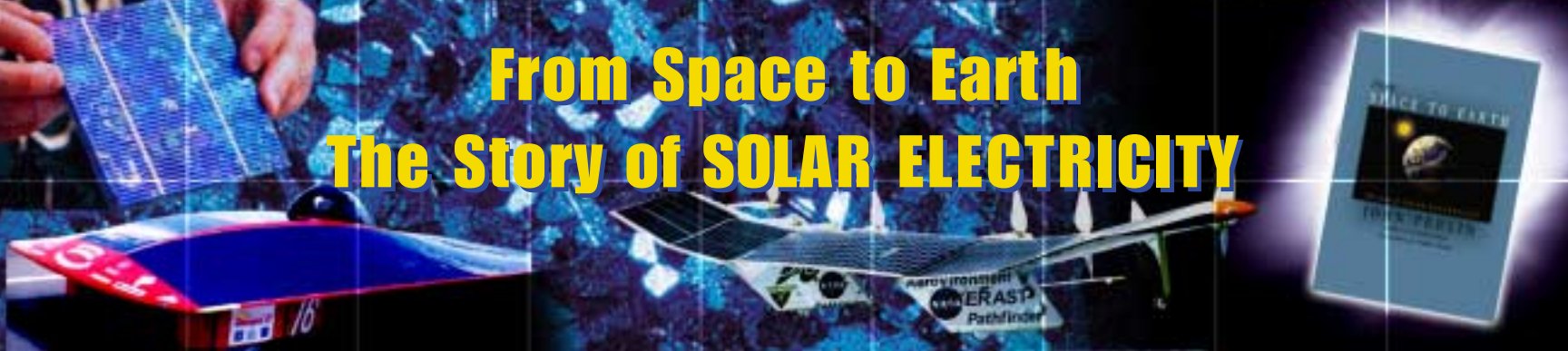


Exhibit based on the book  
**From Space to Earth — the Story of SOLAR ELECTRICITY**  
by John Perlin

[www.californiasolarcenter.org](http://www.californiasolarcenter.org)



# From Space to Earth The Story of SOLAR ELECTRICITY



## Searching for Applications

Despite great expectations for the Bell invention, the silicon solar cell initially powered only playthings.



Courtesy of John Perlin Solar Archives

## Saved by the Space Race

The space race however opened an unexpected and large demand for solar cells. From milliwatts in the little Vanguard launched in 1958, to kilowatts for the International Space Station, solar cells have powered almost every satellite—indispensable for the military and global economy, as well as for science and entertainment. Without solar power, not much of our utilization of space would have ever happened.



Courtesy of John Perlin Solar Archives



Courtesy of NASA

International Space Station

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## Bringing Solar Cells Down to Earth

With solar cells successful in Space, people began asking why can't they help on Earth. The first major user of solar cells for terrestrial applications was the oil industry, which had both the need and the money.



Courtesy of Solar Power Corporation



Courtesy of Solar Power Corporation



Courtesy of Shell Solar

The U.S. Coast Guard had the ideal use for photovoltaics — powering its many buoys and lighthouses. Today, solar electricity runs 99% of all aids to navigation used by the Coast Guard.



Courtesy of BP Solar



Courtesy of Automatic Power, Inc.

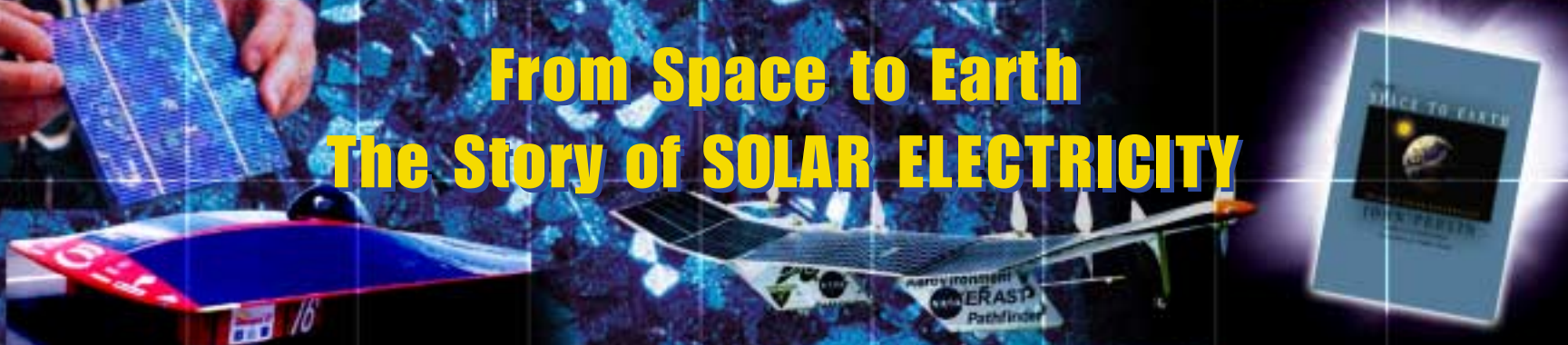


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# From Space to Earth The Story of SOLAR ELECTRICITY



## Long Distance for Everyone

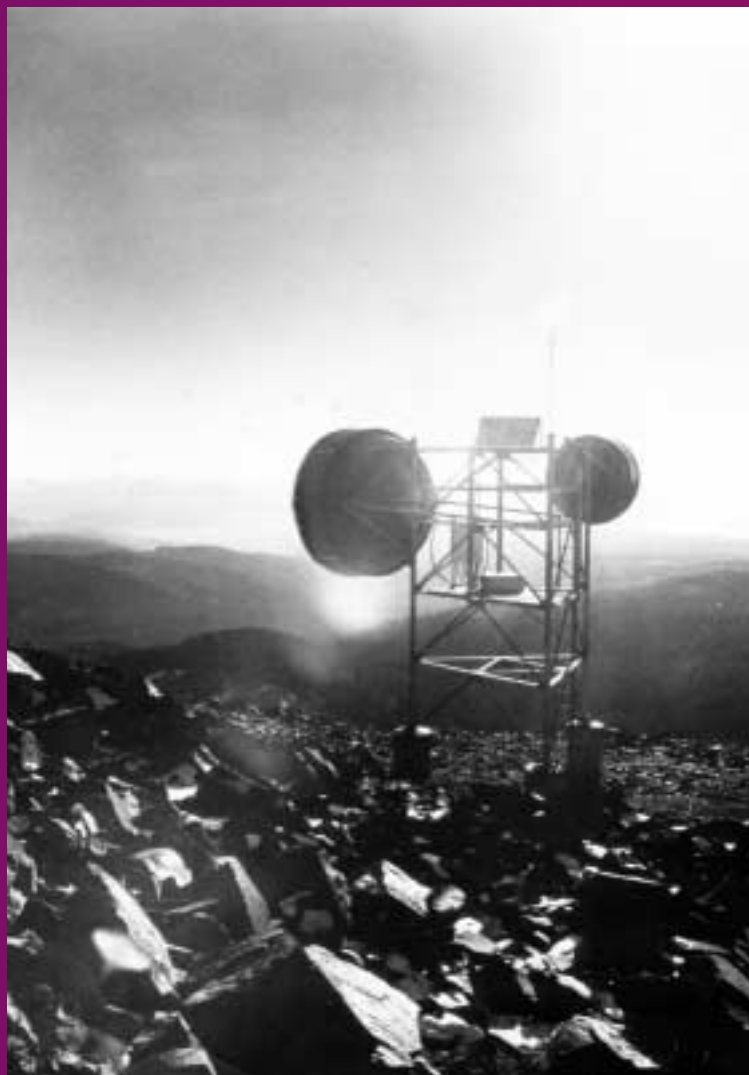
The US Signal Corps saw the value of photovoltaics long before any other organization. Its engineering group designed the solar arrays placed on the Vanguard. To celebrate its centennial, the Corps used photovoltaic panels to serve as the power source for the first solar-powered transcontinental radio broadcast from its headquarters at Ft. Monmouth, New Jersey to El Monte, California, where Hoffman Electronics manufactured solar cells for the Signal Corps.



Courtesy of U.S. Army



Courtesy of U.S. Army



Hunts Mesa, Arizona

Courtesy of John Perlin Solar Archives

By simplifying the electronics in microwave repeaters, John Oades (below right), in 1974, used solar power to bring long-distance telephone service where rugged terrain made normal cabling impossible. A decade later solar became, and today still remains, the energy source of choice for remote telecommunication networks.



Courtesy of John Perlin Solar Archives