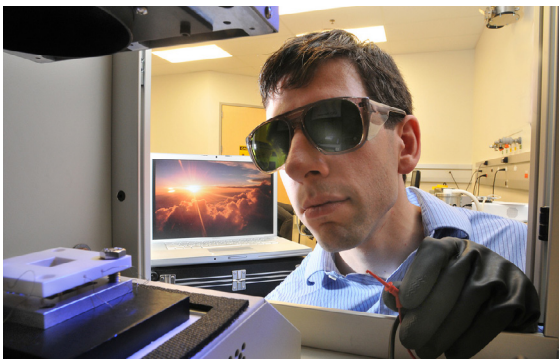
Argonne's Solar Energy Research Initiative

Spurred by global development and population growth, the world's energy needs are expected to double by 2050. The best solution to meet this coming demand is an energy mix that includes generous amounts of renewable energy sources. Of the many options, the sun represents the most abundant renewable energy source.

The Challenge

The costs of converting sunlight to usable electricity, heat or fuel must be radically reduced to realize solar energy's potential. That can only be accomplished through the development of technologies that are low-cost, highly scalable and based on plentiful source materials.



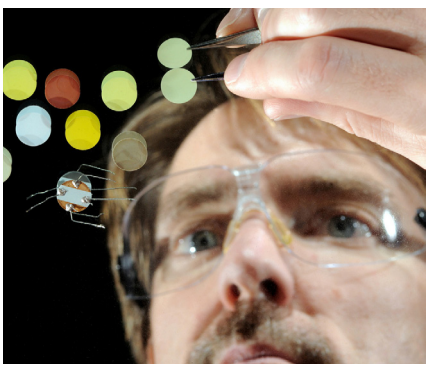
Argonne nanoscientist Seth Darling measures the performance of a nanostructured organic photovoltaic cell using a solar simulator that replices sunlight under standardized conditions.

The Solution

Dozens of researchers at Argonne are exploring new solar technologies as part of its Alternative Energy & Efficiency Initiative. The initiative aims to achieve revolutionary advances in solar energy by merging basic and applied research that is supported by collaborations with industry and other research organizations.

Argonne's research covers many aspects of solar energy, but focuses on five specific areas:

- Next-generation photovoltaic technologies such as organic, hybrid and dye-sensitized solar cells
- Transparent conductors deposited on 3-D photovoltaics
- Concentrating sunlight
- Systems analysis
- Solar fuels



Argonne chemist Jeff Elam examines solar cell materials prepared using atomic layer deposition at various stages of fabrication.

The Future

Argonne's integrated approach to solar energy research represents a new way of addressing the challenges associated with shifting global energy generation away from fossil fuels to provide a clean, secure and virtually limitless supply of energy for the future.

***"By integrating basic research, applied science and systems analysis, we are working to uncover the most efficient and effective pathways to realizing large-scale use of solar energy,"* said Seth Darling, nanoscientist, Argonne National Laboratory.**

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