## What can you do with energy-efficient optics and photonics? Well, for starters...

OPTICS AND PHOTONICS PLAYS IN THE FUTURE OF RENEWABLE ENERGY, DISCOVERING AND COMMUNICATING BREAKTHROUGHS THAT WILL SHAPE THE FUTURE OF CLEAN, SUSTAINABLE, AND RENEWABLE ENERGY FOR GENERATIONS TO COME ≅ SOLAR PANEL · HUMAN-POWERED · SUSTAINABLE · TEMPERATURE · TURBINE · ALTERNATING CURRENT · UTILITIES · VOLT · WATT · ENTROPY · ABSORB · AC · ENERGY · ACCUMULATOR









Get excited about making positive change with the Solar Decathlon.





using lasers to design and manage

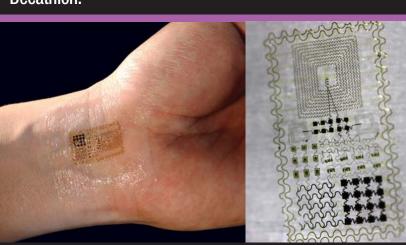
underwater turbine flow.

Beautify a city and save money with lowenergy LED lights.



Use LEDs to reduce greenhouse

Use a temporary tattoo (thinner than a human hair) that can draw power from miniature solar collectors to monitor your heart rate.



With the help of optics and photonics, multiple and creative solutions to these challenges are underway to meet the future. Both renewable and alternative sources are being explored and developed, along with ways to maximize efficiencies with current, more common energy sources and methods. Be part of the exciting world of new energy technologies.

Do you want to explore more?

For cool websites that involve optics and photonics visit:

spie.org/resources

What Exactly is Energy?

Energy is one of the most fundamental components of our

universe and is define as "the ability to do work." In the

context of our infrastructure and daily lives, energy is used

to move, lift, warm, and illuminate things. Most of this

work, as much as 85% of it, is achieved with fossil fuels—

coal, oil, and natural gas. However, increasing demands

from a growing world population, depleting supplies,

increasing costs, and by-products that are detrimental to

the environment and human health, are giving us reasons

to develop and commercialize alternative and renewable

sources.





Itilize solar energy at night with nanostructured capacitors, and use the lights only when sensors

Utilize sensors when drilling for geothermal power,

for greater accuracy and economy.

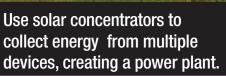


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**Power the Mars Rover.** 



Use the abundant and free energy of the sun to power your world.







Consider the promise of sustainable and safe fusion energy.

from research with lasers at the National Ignition Facility.

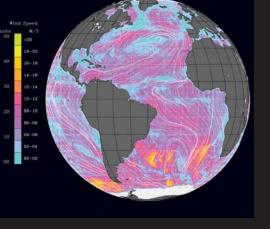


Use optical technology to passively collect

natural light and direct it indoors.









Find the best place to install floating wind farms, using NASA's QuikSCAT satellite maps.

Photos courtesy of: Stefano Paltera/U.S. Department of Energy Solar Decathlon (Solar Decathlon); NASA/JPL-Caltech (Mars Rover); Energy of the sun (SOHO is a project of international cooperation between ESA and NASA); Portable solar panels (Blue Pacific Solar); QuikSCAT satellite (NASA/JPL-Caltech); NIF Facility (Lawrence Livermore National Laboratory); Residential Skylight (Solatube International); Tattoo (UIUC / J. Rogers)