

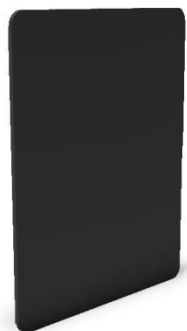
BRIGHTENING UP THE NIGHT FOR LESS

This research and ensuing development explore a new efficient approach for producing light from the abundant energy of the Sun. A nano-antenna receiver harvest incident energy from the Near- and Mid- Infrared, causes electroluminescence and thus converts heat to visible light. Proof of concept has been independently validated by third parties. The **niteSUN** lamp utilizes abundant residual radiation, present even at night anywhere on the planet. Thus, we created a inexpensive , recyclable lamp that seemingly needs no energy input - no batteries, no wires, no heavy or exotic elements, and no maintenance.

While the concept of energy transformation by itself is nothing new, the **niteSUN** is made possible by advances in material science and manufacturing technology including:

1. frequency-dependent modeling of antenna elements;
2. selection of materials with proper THz properties; and
3. novel manufacturing methods that enable economical large-scale manufacturing.

niteSUN represents an important step toward the ultimate realization of a low-cost energy for all people, device of its kind that requires no maintenance, recharging or connection to electric grid for the duration of its lifetime



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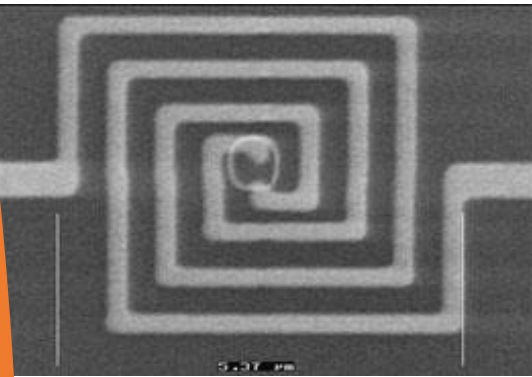
niteSUN



Nanoantennas at work

Making light from what we do not see

consulting
R & D
prototyping
e-manufacturing



Nanoantennas as energy-harvesting devices

SHORT LENGTHS OF WIRE CAPTURE INCIDENT ELECTROMAGNETIC RADIATION

The nanoantennas are tiny gold squares or spirals set in a specially treated form of polyethylene, a material used in plastic bags. Their exceptionally small size makes them able to tune in very high THz frequencies (wavelengths down to 1um and beyond). Thus, the nanoantennas can target mid-infrared rays, which the Earth continuously radiates as heat after absorbing energy from the sun during the day.

Infrared radiation is an especially rich energy source because it also is generated by industrial processes such as power plants. Computer models of nanoantennas show that with the right materials, shape and size, the nanoantennas could harvest up to 92 percent of the incident energy at infrared wavelengths. The nanoantennas absorb infrared radiation {heat} and convert it to electricity.



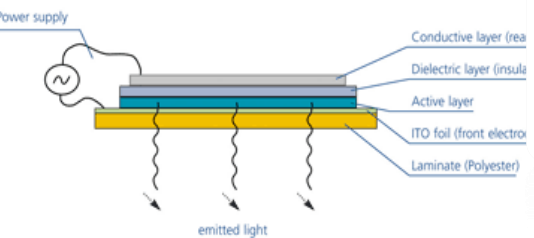
NITESUN ADVANTAGES

- SOLID STATE ENERGY CONVERSION.
- LOW MANUFACTURING COST.
- DURABLE, EASY TO USE.
- NO HARMFUL MATERIALS INSIDE.
- FULLY RECYCLABLE BY DESIGN.
- MAINTENANCE-FREE OPERATION.
- EASILY SCALABLE MANUFACTURING.
- HEAT REMOVAL (SIDE EFFECT).
- LIGHTWEIGHT, UNBREAKABLE.
- USES AMBIENT IR RADIATION.

converting heat to electricity and light

ELECTROLUMINESCENCE

Electroluminescence (EL) is a phenomenon in which a bulk of material emits light in response to the passage of an electric current or to a strong electric field across it. The luminescing material is enclosed between two electrodes where the rear electrode is reflective and the front electrode is transparent, so the produced light can be emitted to space.



niteSUN METRICS

Dimensions (mm):	186 (W) x 241 (H) x 3.6 (D)
Weight (g):	84
Light Output (lm):	320
Temperature (°C):	32 – 40
Lifespan (h):	20,000
MSRP (USD):	12

THE DUAL CONVERSION: HEAT – ELECTRICITY - LIGHT

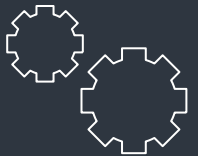
PUTTING IT ALL TOGETHER

niteSUN has a simple construction where a durable polymer shell fully encloses and shields the working end of the lamp. The shell, normally closed, can be opened, in a manner similar to a smartphone or tablet computer.

When opened, the thermal shield no longer protects the lamp and it begins to produce light.

When light is no longer needed, simply close the **niteSUN** shell to “turn it off”.

The lamp will operate in any position and at any time of day or night, anywhere, as long as there is radiant heat nearby. Note that radiant heat exists even in polar regions, and in space (vacuum).



INNER WORKINGS

niteSUN works on the principle of absorbing heat and converting it to alternating current, then using that current to induce light emissions in electroluminescent material. Electroluminescence is the most energy-efficient method known to produce visible light.



EASE OF USE

niteSUN is ON as long as its cover is open. Closing its cover shields the lamp from IR radiation and terminates the light production. There are no switches, wires, batteries, breakable or dangerous parts to deal with. The lamp is rated for 2 years continuous operation.



SAFETY & SIDE EFFECTS

niteSUN does not emit harmful radiation, does not leak chemicals and does not pollute its environment in any way. It WILL reduce the amount of incident radiant heat when in operation – this is a behavior by design, as the lamp converts the heat to light

