

Japanese win the 2014 Nobel Prize in Physics

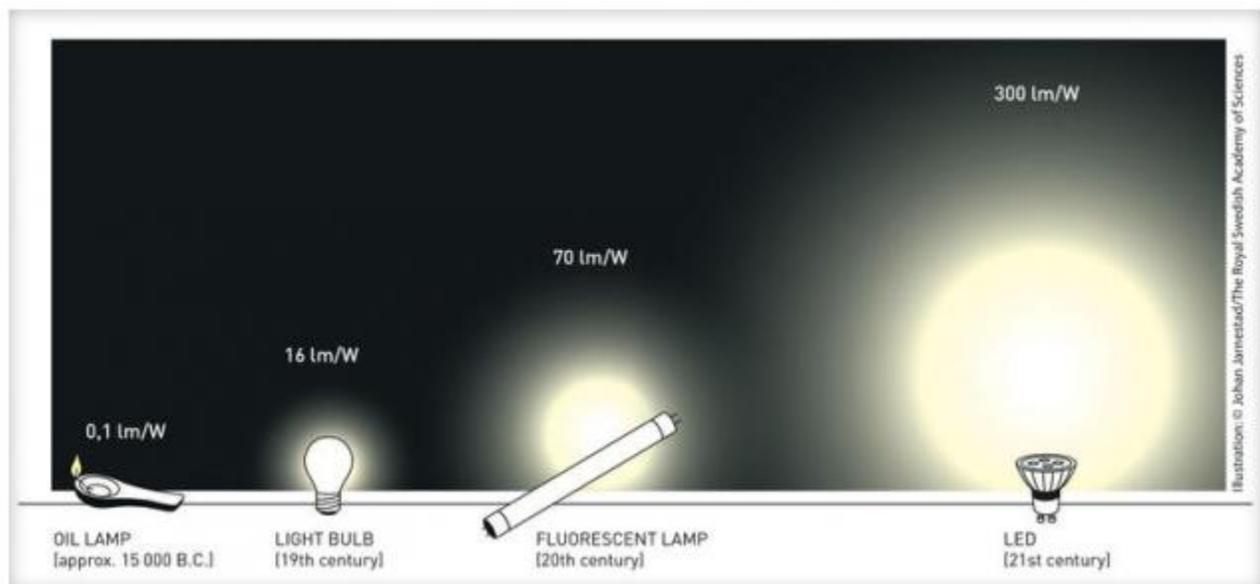
Three Japanese Physicists, Professors Isamu Akasaki, Hiroshi Amano, and Shuji Nakamura, who together helped increase the energy efficiency of lighting systems across the world have been awarded the Nobel Prize in Physics, the Royal Swedish Academy of Sciences announced Tuesday, 7 October, 2014

The three share the Nobel Prize for their invention of the blue light-emitting diode (LED), a technology now used to light up smartphones and computer screens, purify polluted water, and bring cost-effective, efficient white light to people all over the world. First created by the trio in 1990, the blue LED has helped “revolutionize” illumination technology — a revolution that the Academy deemed of “greatest benefit to mankind.”

“They succeeded where everyone else had failed,” the Academy said in a statement. “The invention of the blue LED is just twenty years old, but it has already contributed to create white light in an entirely new manner to the benefit of us all.”

White light — the kind naturally produced by the sun — can be artificially made by mixing red, green, and blue light. Before 1990, scientists had only figured out how to make green and red LEDs. That was a problem, because without blue, there was no way to replicate the usable white light formed by florescent lamps or conventional bulbs.

Akasaki, Amano, and Nakamura cracked the code. With their invention of the blue light, white LED light was finally able to be created. Those white LEDs soared in popularity for lighting systems, and for good reason — they are 20 times as efficient as incandescent bulbs; they lack the mercury-related health risks of fluorescent bulbs; and they last as long as 22 years before burning out.



LED lights produce the most lumens of light per watt of electrical power compared to other forms of light.

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The Academy lauded the inventors for creating something environmentally-friendly, and noted that replacing all regular light bulbs and fluorescent tubes with LEDs would lead to a “drastic reduction” of electricity requirements for lighting. According to the Academy, 20 to 30 percent of all electricity consumed in industrial economies comes from lighting. If all of those bulbs were replaced with LEDs, that percentage would drop down to about 4 percent, the Academy said.

A reduction in electricity use as drastic as 16 to 26 percentage points would provide benefits to the climate. In the United States, for example, it is estimated that if every household replaced just one regular light bulb with an LED, it would prevent the emissions of approximately 2.5 million tons of greenhouse gases — the emissions equivalent to taking about 550,000 cars off the road. Replace all those bulbs, and the emissions reductions would be even greater.

The Academy also noted that LEDs are helping improve the quality of life for more than 1.5 billion people around the world who don’t have access to electricity grids. Because the LED bulbs have such low power requirements, they don’t need grids; they can be powered by cheap, small, solar panels. And because powering the lights doesn’t require non-renewable, costly fossil fuels, the solar panel pays for itself over time, and electricity generated is eventually free — both monetarily and emissions-wise.

Clean LED lights have already been helping transform rural areas in India, as noted by aThinkProgress report from Uttar Pradesh in July. There, dairy farmers are using LED lanterns powered by solar to milk their cows before sunrise; women who weave saris are using them to work longer hours and make extra money; and students are using them to study at night.

LED lights have also helped decrease the emissions of a substance known as “black carbon,” or soot, a particle that makes climate change worse by temporarily changing the energy makeup of the earth. In Uganda, for example, researchers discovered that the kerosene lamps widely used there were major emitters of black carbon. That problem was easily solved by replacing the lamps with cheap LED replacements.

Reference

<http://thinkprogress.org/climate/2014/10/07/3576889/blue-led-nobel-prize/>