UC SANTA BARBARA

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Sonia Fernandez

Massive Impact

Not too long ago, if you left the lights on by accident overnight or while you were on a trip, you would pay for that mistake with big increases to your electricity bill. Heat producing, often short-lived and relatively inefficient, the incandescent, fluorescent, halogen, mercury and other lamps long the mainstay of indoor and outdoor lighting worldwide also accounted for a significant portion of global energy consumption.

That all changed with the creation of the bright blue LED by UC Santa Barbara materials and electrical and computer engineering scientist Shuji Nakamura, who, along with Hiroshi Amano and Isamu Akasaki (both from Nagoya University), won the 2014 Nobel Prize in Physics for unlocking the technology that led to the birth of the white LED.

Energy efficient, durable and versatile, white LED lighting is ubiquitous today, with the technology present in homes, offices, cars and devices, streets, storefronts and more. Thanks to LED lighting, U.S. electrical consumption for lighting will drop more than 40% by 2030, according to the U.S. Department of Energy, in turn saving over 50 power plants' worth of energy, and potentially reducing 185 million tons of carbon dioxide emissions. Operating at only a quarter of the energy that incandescent bulbs consume, LEDs also allow for significant savings to the consumer and fewer spikes to their electricity bills.

For these benefits and more, Nakamura has been selected to receive the 2019 Leigh Ann Conn Prize for Renewable Energy. The biennial award, bestowed by the University of Louisville (UofL), is meant to to "acknowledge, publicize and

disseminate outstanding ideas and achievements in research related to the sciences, engineering, technology and commercialization of renewable energy."

"It is my great honor to receive the Leigh Ann Conn Prize," said Nakamura, UC Santa Barbara's CREE Distinguished Professor of Materials, and a recipient of other honors including the Millennium Technology Prize, membership in the National Inventors Hall of Fame, the National Academy of Engineering and the National Academy of Inventors. "Global warming is becoming a big issue; I hope that LED and laser lighting contribute to a bright future for human kind by reducing energy consumption."

"Dr. Nakamura is a world-class scientist dedicated to the viability of LED technologies. His work and perseverance are an inspiration to us all," said UofL President Neeli Bendapudi, who will confer the award. "The University of Louisville celebrates his research and its positive influence. In a world where energy use must be environmentally responsible, he is an outstanding winner of the Leigh Ann Conn Prize."

LEDs offer the most energy savings of any lighting source and are versatile enough to provide light in a variety of applications, from residential and commercial to automobiles and device displays. Their efficiency, compactness and durability also lend themselves to search-and-rescue operations as well as lighting in inhospitable environments and remote areas out of the reach of electricity infrastructure. Cool-burning LEDs reduce the need for air conditioning and its associated energy consumption and reduce overall greenhouse gas emissions generated by burning fossil fuels.

"The revolutionary LED technology invented by Dr. Nakamura has enabled energy efficient solid state lighting and low cost LED light sources that are already saving U.S. consumers billions of dollars per year in electricity costs," said Steven DenBaars, Nakamura's colleague, a fellow professor of materials and electrical and computer engineering, and the director of the Solid State Lighting & Energy Electronics Center at UC Santa Barbara.

"The impact of Dr. Nakamura's work is massive, and exactly what Leigh Ann thought mattered most: What good is innovation if it never changes the world?" said Hank Conn, UofL alumnus and father of Leigh Ann Conn. "LED lighting touches people in all economic strata, saving energy and money with global reach. It is exciting to

recognize this outstanding scientist, his innovations, and their translation into clearly impactful technology.”

Nakamura will officially receive the Leigh Ann Conn Prize for Renewable Energy — a medal and a $50,000 award — and deliver a public lecture at a formal ceremony in March 2020.

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.