

Japanese scientists win Nobel Prize for Physics

“Laboratory artistry at the highest level.”

Isamu Akasaki and Hiroshi Amano became Japan’s 20th and 21st Nobel Laureates when they were jointly awarded the 2014 Nobel Prize for Physics with Shuji Nakamura of the United States, “for the invention of efficient blue light-emitting diodes which has enabled bright and energy-saving white light sources”.

The trio won the award for research done jointly and individually to create blue light-emitting diodes (LEDs). Prior to the trio’s achievement, researchers had only produced red and green LEDs, but without blue, no white light could be produced.

Although the blue LEDs were only realised 20 years ago, today LED lighting is commonplace in countries such as Australia. Technology would not look the same without it—indeed many people would have watched the news about the 2014 Nobel Prize recipients on their LED TV or computer screens—so ubiquitous is the technology becoming.

Announcing the award, the Nobel Prize Academy described the three scientists’ inventions as revolutionary, saying the 21st century will be lit by LED lamps. The Academy’s online ‘Popular Information’ remarks noted:

*The Laureates challenged established truths; they worked hard and took considerable risks. They built their equipment themselves, learnt the technology, and carried out thousands of experiments. Most of the time they failed, but they did not despair; this was laboratory artistry at the highest level.**

The material they chose to produce blue light was gallium nitride. While it was realised to be suitable for the purpose, most considered the material too difficult in practice. Akasaki, Amano and Nakamura were not put off. They also went on to create a blue laser using the blue LED.

At the time they first succeeded creating blue light in the early 1990s, Akasaki and Amano were both at Nagoya University (Amano a PhD student with Akasaki), and Japan-born Nakamura was a researcher at a small company Nichia Chemicals in Tokushima, Japan. Today Akasaki is at both Meijo University in Nagoya and Nagoya University where Amano works, and Nakamura is at the University of California, Santa Barbara, USA.

About one quarter of world electricity consumption is used for lighting, so the highly energy-efficient LEDs help save precious resources, and being longer lasting, save materials. In developing countries, LED lamps powered by the sun could greatly improve the quality of life for those not connected to a power grid.

Read more about the technology and its applications at Nobelprize.org—

****www.nobelprize.org/nobel_prizes/physics/laureates/2014/popular.html***

Japan’s Nobel Laureates

- Hideki Yukawa: 1949 Physics
- Shinichiro Tomonaga: 1965 Physics
- Yasunari Kawabata: 1968 Literature
- Leo Esaki: 1973 Physics
- Eisaku Sato: 1974 Peace
- Kenichi Fukui: 1981 Chemistry
- Susumu Tonegawa: 1987 Physiology or Medicine
- Kenzaburo Oe: 1994 Literature
- Hideki Shirakawa: 2000 Chemistry
- Ryoji Noyori: 2001 Chemistry
- Masatoshi Koshiba: 2002 Physics
- Koichi Tanaka: 2002 Chemistry
- Osamu Shimomura: 2008 Chemistry
- Makoto Kobayashi: 2008 Physics
- Hideki Maskawa: 2008 Physics
- Yoichiro Nambu: 2008 Physics
- Eiichi Negishi: 2010 Chemistry
- Akira Suzuki: 2010 Chemistry
- Shinya Yamanaka: 2012 Physiology or Medicine
- Isamu Akasaki: 2014 Physics
- Hiroshi Amano: 2014 Physics

Ojizo-san

A gentle guardian of children

Visitors to Japan travelling along country roads might have come across small stone statues of a gently smiling figure. Often the statue has been dressed in a red bib or bonnet. There might be some flowers by the statue. These roadside figures may be exposed to the elements or housed in little huts. They are also found in temples.

At first you might wonder if the statues are supposed to depict mini-priests or children. They are in fact Jizo, or more politely, Ojizo-san.

Ojizo-san is a bodhisattva, *bosatsu* in Japanese. This is a figure of compassion in Buddhism. A bodhisattva delays reaching Nirvana, despite being able to do so, because of its own feelings of compassion for other beings who are suffering.

In Japan, Ojizo-san is seen as the protector of people, and at different points in time, there have been different Jizo which have been attributed with rescuing people from fire and other hardships. A famous folktale is *Kasajizo* in which six stone Jizos come to life one New Year’s Eve and give food to an elderly couple who have no rice after the old man gave up his last possessions to keep the statues free from snow.



Today the Jizo figure is mostly thought of as the guardian of souls of deceased children. In fact, another name for Jizo is *Ko-sodate-Jizo*, which translates as ‘the Jizo who raises children’. The souls of children are said to go to the banks of the Sanzu River. There they play on the riverbank, but the children are sometimes disturbed by devils. Ojizo-san arrives to protect the children, who are said to hide in the folds of his cloak.

As the guardian deity of children, Ojizo-san is perceived as a kindly figure, and *jizogao* is a term to describe a round, gentle or happy face. Many depictions of Ojizo-san are exactly that—happy, round faces whose gentle smiles suggest ‘Don’t worry. Everything’s going to be okay.’