

## CS Industry Awards Recognize UCSB Team for LED Droop Research



Professors [Steven DenBaars](#) and [Shuji Nakamura](#)

of the Solid State Lighting and Energy Center were honored earlier this year as finalists for the [2012 Compound Semiconductor \(CS\) Industry Awards](#) for their groundbreaking research on quantum wells to reduce LED droop. CS Industry Awards recognize the success and development along the entire value chain of the Compound Semiconductor industry from research to completed device.

The UCSB researchers have shown that increasing the number of quantum wells in an LED can slash its droop and the decline in device efficiency as current is cranked up. The team fabricated two high-power blue LEDs that differed only in the number of quantum wells. The LEDs fabricated by the researchers featured 20 nm-thick barriers, 4 nm-thick quantum wells and a 10 nm-thick undoped Al<sub>0.15</sub>Ga<sub>0.85</sub>N electron-blocking layer. "Though our wells may be a little thicker [than those used in many commercial LEDs], it is the best structure for a high output power LED at UCSB," revealed Nakamura, who has also been awarded a Millennium Technology Prize and "Technology" Emmy for his LED research and contributions to display technology. Nakamura believes that LEDs with more quantum wells suffers from less droop because the current density in these structures are lower, reducing nonradiative Auger recombination. In addition, he argues that more quantum wells can reduce the overflow of carriers ? particularly electrons ? through the active region. The CS Industry Awards were created by Compound Semiconductor to recognize the vital individuals and companies that enable a company to achieve success in a competitive global market.

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