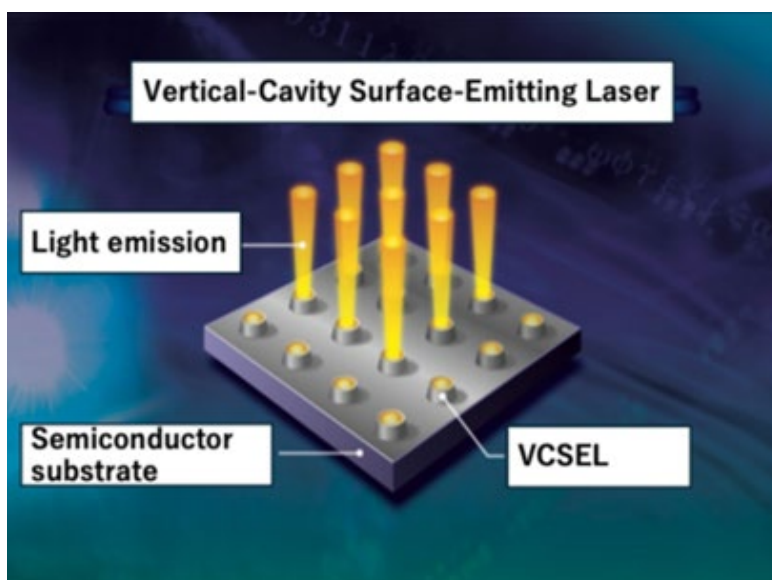


The 46th Honda Prize 2025 Awarded to Dr. Kenichi IGA —Pioneering contributions to the conception and development of Vertical-Cavity Surface-Emitting Laser (VCSEL), and leadership in its practical application—

The Honda Foundation (Founders: Soichiro and Benjiro Honda, President: Hiroto Ishida) has decided to award the 2025 Honda Prize to Dr. Kenichi Iga (Honorary Professor at Institute of Science Tokyo and 18th President of former Tokyo Institute of Technology), for his conception of Vertical-Cavity Surface-Emitting Laser (VCSEL) and pioneering contributions to its basic research, and his leadership in its practical application. The VCSEL emits light vertically from the chip surface and enables high-density array formation^{*1} and high-density integration.



Dr. Kenichi Iga



VCSEL Array

^{*1} A structure integrating multiple laser elements arranged in a regular pattern. Enables high-density integration and simultaneous multi-point irradiation.

■ Solving the challenges of semiconductor lasers

Semiconductor lasers are laser oscillators^{*2} that operate on power sources comparable to those of general electronic circuits, using tiny elements with sides measuring less than 1mm. Today, they are used in a wide range of fields in daily life and industry, such as optical fiber communications and reading optical discs like DVDs. This technology was significantly advanced toward practical application by Dr. Kenichi Iga, who proposed the surface-emitting laser as a type of semiconductor laser. It possesses characteristics not found in conventional semiconductor lasers, such as stable oscillation at a single wavelength, ease of mass production, the ability to continuously vary wavelength, and low power consumption.

■ Technological innovation through surface-emitting lasers

Compared with conventional semiconductor lasers which emit light horizontally relative to the substrate, VCSEL emits light vertically, making it more compact, and produces less interference among neighboring modes, enabling high density integration. Surface-emitting lasers are an indispensable technology in short-range LiDAR^{*3}, which precisely maps the state of an automobile's surroundings (ranging from tens of centimeters to several meters).

High-density placement enables simultaneous multi-point emission over a wide area, allowing instantaneous scanning. Furthermore, minimal wavelength variation is key to enabling high-precision measurement. Additionally, the compact and thin form factor facilitates easy integration into bumpers, mirrors, and doors, and its low power consumption is also considered an excellent characteristic for automotive components.

^{*2} A device that continuously generates waves of a specific frequency, when waves emitted from an amplifier are fed back to the amplifier (feedback).

^{*3} Technology that measures distance to and shape of an object by irradiating it with laser light and analyzing the reflected light data.

■ Realizing practical application of surface-emitting lasers

Dr. Kenichi Iga, who pioneered the practical application of surface-emitting lasers, proposed the concept in 1977. In 1988, Dr. Fumio Koyama (currently Distinguished Professor/Professor Emeritus at the Institute of Integrated Research, Institute of Science Tokyo), a student of Dr. Iga, succeeded in achieving continuous-wave operations at room temperature, paving the way for practical implementation. Since then, researchers worldwide have engaged in surface-emitting laser research, with related papers now exceeding 60,000 globally. Worldwide adoption and development efforts by numerous companies have led to commercialization of the technology, bringing significant transformations to people's lives, enabling ultra-high-speed, high-capacity parallel communication in data centers and LANs, energy savings, 3D facial recognition in smartphones, and expansion into LiDAR.

The Honda Prize award ceremony is scheduled to be held at the Imperial Hotel Tokyo on November 17, 2025. In addition to the prize medal and diploma, the laureate will be awarded a total of 10 million yen.

* For details, please refer to the following:

Honda Foundation press release:

https://www.hondafoundation.jp/news/view_en/1795

Honda Foundation website | Achievement Commentary:

https://www.hondafoundation.jp/commemoration/index_en/285/year:2025