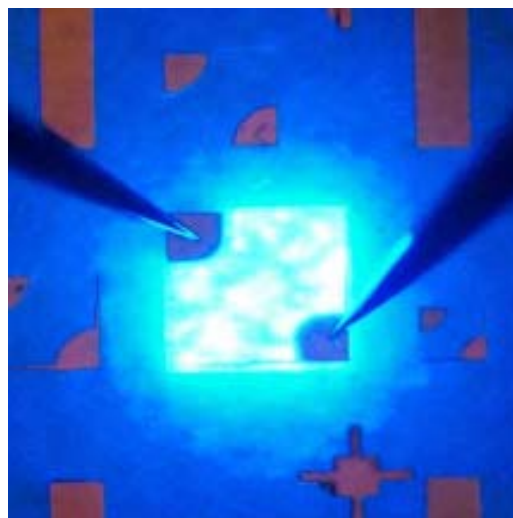




## Optoelectronics Laboratory Department of Electrical and Communications Engineering

Optoelectronics Laboratory is located in MICRONOVA, TKK's centre for micro- and nanotechnology. Research in Optoelectronics Laboratory focuses on developing new micro- and nanostructures for diverse applications such as lasers, leds, detectors, sensors and photonic crystals. In the field of nanotechnology self-assembled growth of semiconductor nanostructures has been carried out during the last twelve years. Advanced materials science is employed in the research and development. Teaching includes courses in optoelectronics, photonics and integrated optics, nanotechnology. The laboratory is also in charge of the first year physics courses for the department. Laboratory directs the International Master's Programme in Micro- and Nanotechnology.



*Bright blue LED chip fabricated at  
Optoelectronics Laboratory being tested.*

### RESEARCH AND EXPERTISE

There are two research groups in the laboratory. The **Optoelectronics** Group is focused on three major areas:

1. GaN technology for blue LEDs and lasers
2. Dilute nitride technology for telecommunication
3. Compound semiconductor X-ray detectors for astronomy

The research group on **Nanotechnology** studies the following areas:

4. Semiconductor quantum dots and rings
5. Semiconductor nanowires
6. Photonic crystals
7. Atomic layer deposition for functional layers

In addition to these, numerous smaller projects have been carried out on various topics.

### STAFF

1 professor, 2 senior researchers, 2 post-doc researchers and 15 postgraduate students.

### ACADEMIC DEGREES IN 2005

In 2005, two Doctoral degrees, 1 Licentiate's and 2 Master's degrees were completed.

### MAJOR FACILITIES AND EQUIPMENT

Two metalorganic vapor phase epitaxy systems for the growth of semiconductors based on GaN, GaAs, InP, high-resolution x-ray diffraction system, atomic force microscope, low-temperature photoluminescence system, 10 W pump laser (532 nm), UV-laser (266 nm), fs-laser (150 fs), HeCd-laser (325 nm), time-correlated single photon counting system, cooled Ge-detector, 4 monochromators, 2 closed-cycle He-cryostats, 7 T superconducting magnet, probe station.

### CONTACT PERSON(S)

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**MORE INFORMATION:** <http://atomi.hut.fi>