

Integrated Optoelectronics Laboratory

[2010]

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Laboratory Members

Professor	Toshiaki SUHARA	(Dr.Eng.)
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Research Associate	Masahiro UEMUKAI	(Dr.Eng.)
Technical Assistant	Yukio HAYASHI	
Secretary	Yuka YOSHIZAKI	

- 0 Postdoctoral Research Fellow**
- 0 Doctor-course students**
- 10 Master-course students**
- 1 Research Student**
- 5 Undergraduate students**

Current Research Subjects

[1] LiNbO₃ waveguide nonlinear-optic devices

- Quasi-phase-matched (QPM) second-harmonic generation (SHG) devices
- QPM difference-frequency generation (DFG) devices
- QPM sum-frequency generation (SFG) devices
- Ferroelectric-domain-inverted structures for QPM
- LiNbO₃ waveguides for NLO devices (proton exchange, Zn-diffusion, ---)
- Wavelength conversion for WDM photonic network systems
- High-speed optical sampling and picosecond optical switching
- Generation of twin photons and quantum entanglement by waveguide devices
- Ferroelectric-domain-inverted spatial light modulators

[2] Semiconductor integrated photonic devices

- Grating components for semiconductor waveguides
- Quantum-well DFB/DBR lasers (AlGaAs/GaAs, InGaAs/AlGaAs, AlGaInP/InGaP)
- Integrated master oscillator power amplifiers (MOPA) with grating coupler
- Integrated tunable lasers
- Integrated-photonic sensors
- Area-selective quantum-well disordering by impurity-free vacancy diffusion

Facilities

Patterning

Electron-beam writing systems, Laser-beam writing system, Photolithography system

Processing

Plasma CVD system, RF sputtering systems, Vacuum evaporation systems,
Reactive ion etching system, Ion beam etching system,
Rapid thermal annealer, Wire bonders, Dicing machine, Crystal polisher,
Ferroelectric domain inversion systems, Surface activation direct bonding machine

Characterization

Scanning electron microscope, Optical microscopes, Photoluminescence system,
Surface profile meter, Ellipsometer, Confocal microscope

Lasers and optical instruments

Ti:Al₂O₃ lasers, Argon lasers, Nd:YAG lasers, Er-doped fiber amplifiers, Mode-locked
fiber laser, Semiconductor lasers, Tunable semiconductor lasers, Picosecond
semiconductor lasers, High-power semiconductor lasers, Gas lasers
Autocorrelator, Optical spectrum analyzers, Monochrometers,
Single photon detectors, Quantum-noise measurement system
Optical benches