

# Photonic Networks Area (Maruta Laboratory)

Department of Information and Communications Technology,
Division of Electrical, Electronic, and Information Engineering, Graduate School of Engineering

## **Research Areas & Topics**

Towards the next generation of high-speed, large-capacity, and highly-efficient photonic networks, Maruta Laboratory is in charge of research and education for advanced photonic technologies including the following subjects:

#### Photonic Networks

- ➤ High-speed optical switching
- Next-generation optical access network
- ➤ Radio-over-Fiber (RoF) communication system

## **◆**Ultrafast All-Optical Signal Processing

- > All-optical analog-to-digital/digital-to-analog conversion
- ➤ All-optical modulation format conversion

### **◆**Long-Haul Optical Fiber Transmission

- Optical multi-level/multi-carrier modulation
- Mode division multiplexing transmission
- Optical eigenvalue modulation

URL: <a href="http://wwwpn.comm.eng.osaka-u.ac.jp">http://wwwpn.comm.eng.osaka-u.ac.jp</a>

**Future Photonic Networks** ✓ High-speed ✓ Elastic √ Green Long-Haul Transmission ✓ Secure Optical eigenvalue modulation >Optical multi-level/multi-carrier modulation ➤ All-optical format conversion Metro/Core Networks Optical router ➤ Optical packet switching networks Adaptively modulated optical multicarrier packet Mode division multiplexing transmission over few-mode fibers Photonic A/D,D/A conversion **Access systems** >OFDMA/OCDMA-based passive optical networks High-capacity millimeter-wave RoF transmissions

(OFDMA = Orthogonal Frequency Division Multiple Access)

(OCDMA = Optical Code Division Multiple Access)

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