

What is OKATEM?



OKATEM is Turkey's first R&D center specialized in the area of optical wireless communications. Established at Özyeğin University with the financial support from Istanbul Development Agency (ISTKA), OKATEM is equipped with state-of-the-art equipment to carry out fundamental and applied research in optical wireless communication systems operating at infrared, visible or ultraviolet bands. With participation from six universities, six companies and one NGO, OKATEM aims to position Turkey as a leading country in this emerging technology area.

OKATEM Team

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Member Institutions



Lead Institution



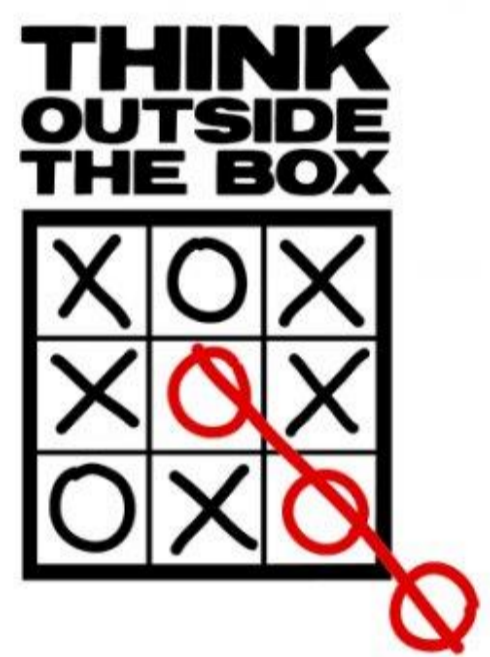
Partner Institution



Participating Institutions

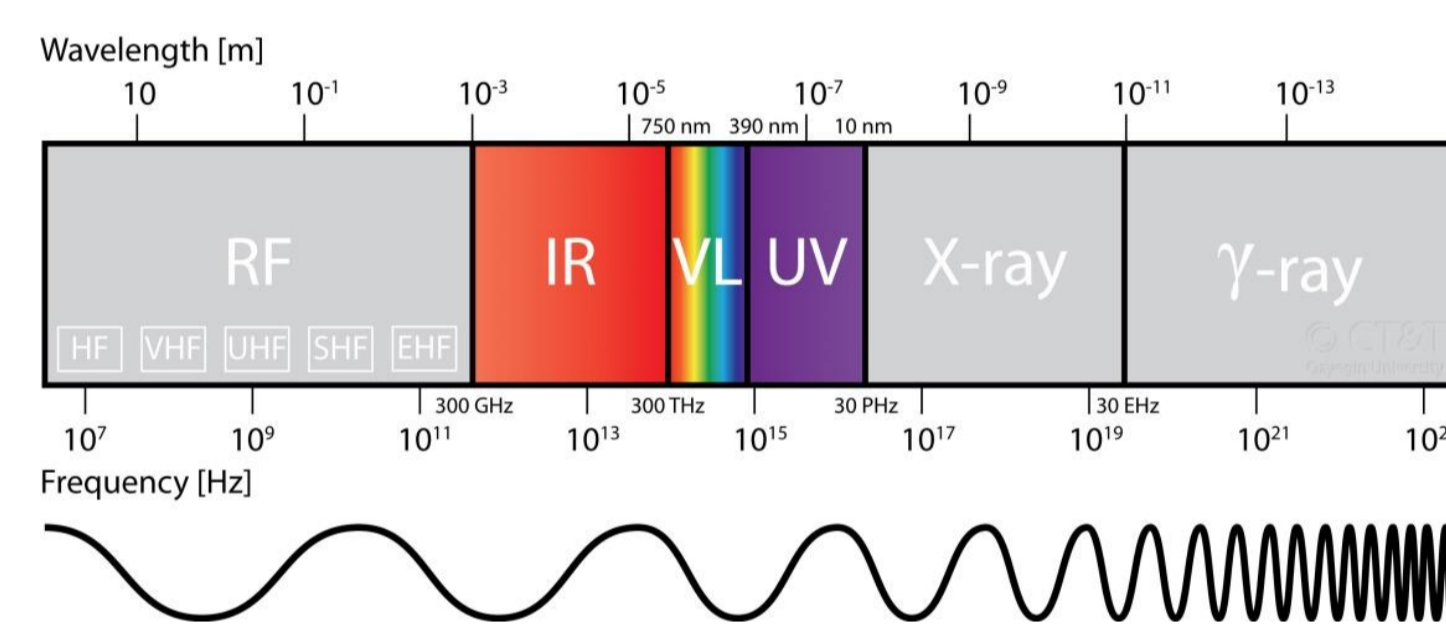


Why Optical Wireless?



WIRELESS \neq RF

Offering significant technical and operational advantages, optical wireless communication (OWC) can be, in some applications, a powerful alternative to and, in others, complementary to existing radio frequency systems. OWC technology is uniquely positioned to address various connectivity needs in future communication networks, whether in the core, edge, or access.



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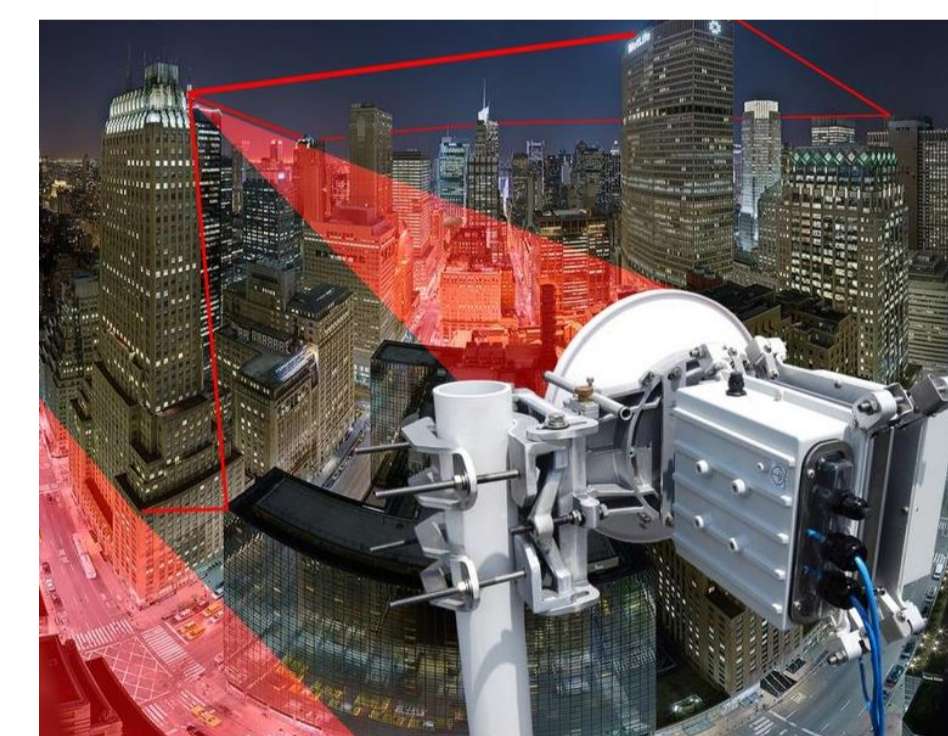
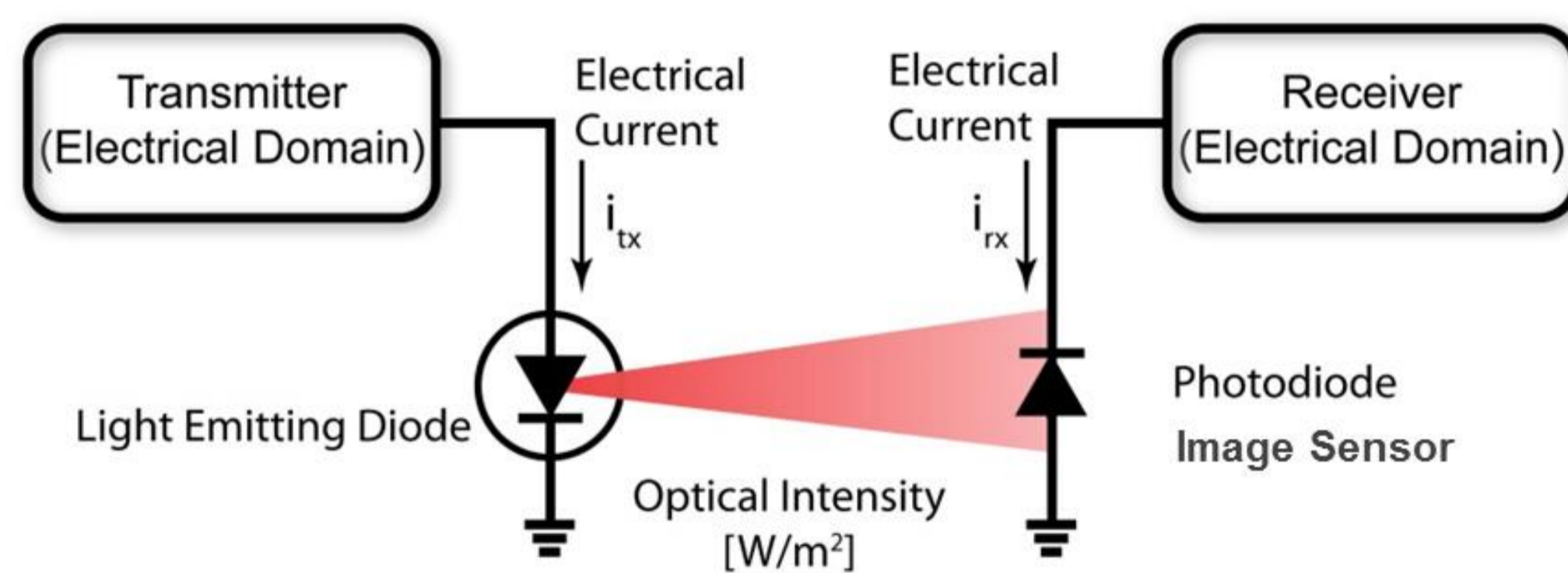
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OWC Fundamentals

Transmitter

- ☐ Baseband processing (modulation, coding etc) in electrical domain
- ☐ Electrical/Optical Conversion
 - Laser (small FoV, restricted to LOS)
 - LED (large FoV, supports LOS/NLOS)
- ☐ Amplitude constraints
 - Non-negativity of the signal
 - Eye-safety regulations for laser



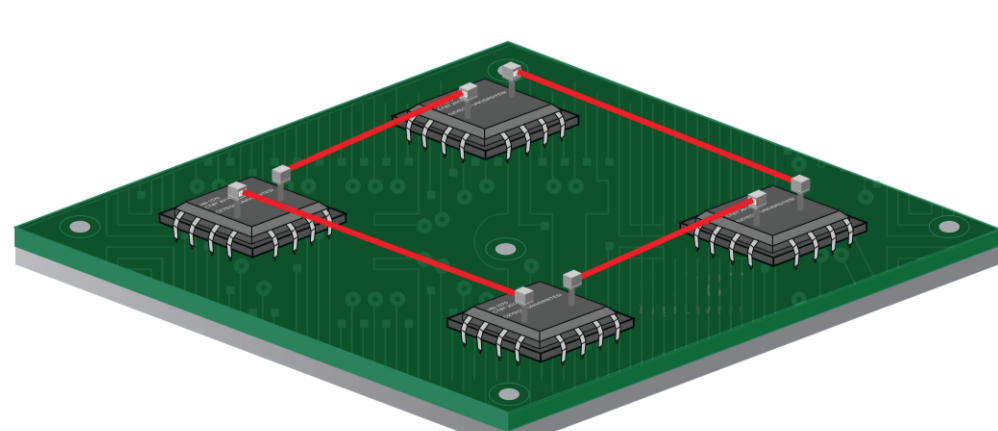
Receiver

- ☐ Optical/Electrical conversion (Photodetector, image sensor)
- ☐ Baseband processing (demodulation, decoding etc) in electrical domain



Application Areas

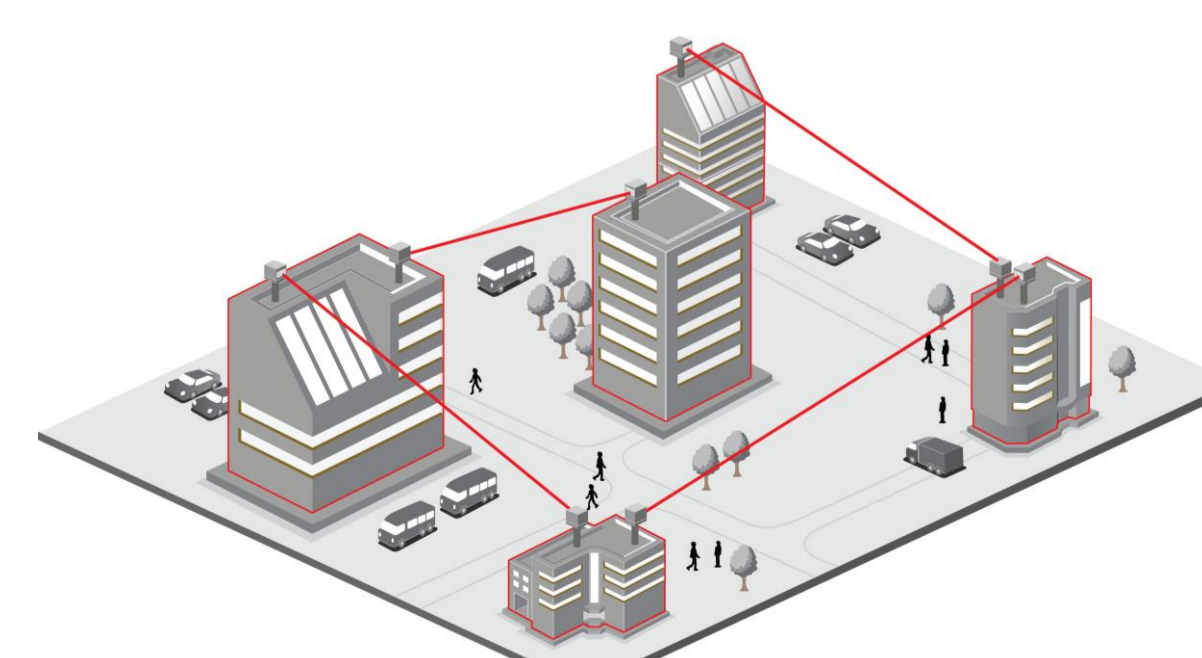
Variations of OWC can be employed in a diverse range of communication applications ranging from very short-range (on the order of millimetres) optical interconnects within integrated circuits through outdoor inter-building links (on the order of kilometres) to satellite links (larger than 10,000 kilometres).



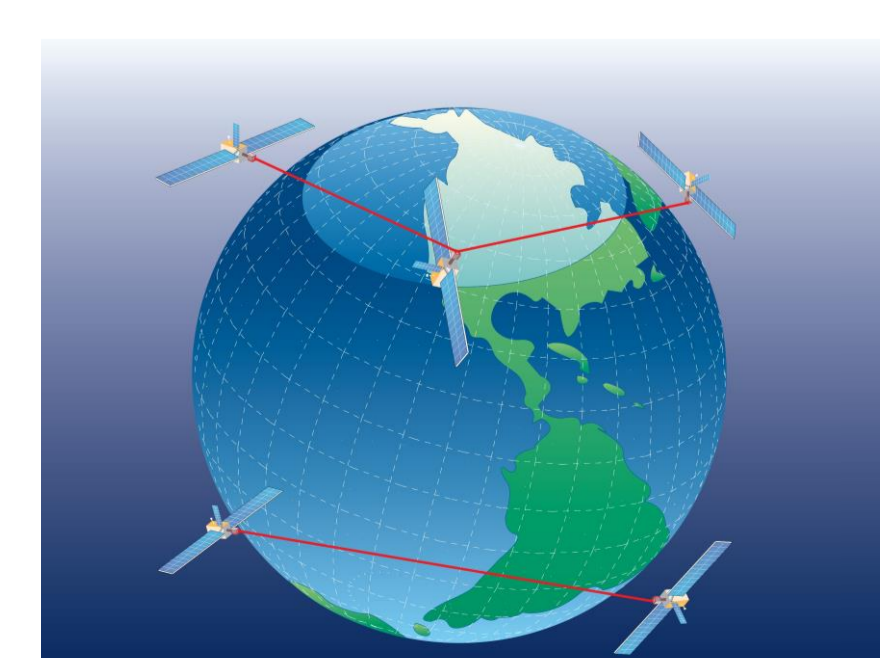
~ mm



~ m



~ km



> 10000km

Some OWC applications categorized with respect to transmission range. a) Interchip connection, b) Visible light communication for indoor wireless access, c) Interbuilding connections d) Intersatellite links.