



Tomoyuki Miyamoto Lab.

Optical Wireless Power Transmission (OWPT)

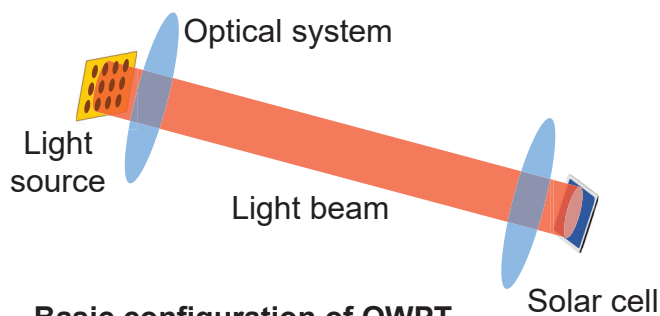
Photonics Integration System Research Center, FIRST

<http://vcSEL-www.pi.titech.ac.jp>

- Development of OWPT technology
- Construction and verification of OWPT systems
- Creation of appl.; indoor, mobility, under water, etc.
- Development of devices and modules for OWPT

Innovation of society by OWPT!

Following the development of wireless communications, a major change in society can be expected by wireless power transmission as well. OWPT is promising because of its compact size, long range capability, and no electromagnetic interference. We are working on the construction and verification of systems and devices for pioneering the application of OWPT and its implementation in society.

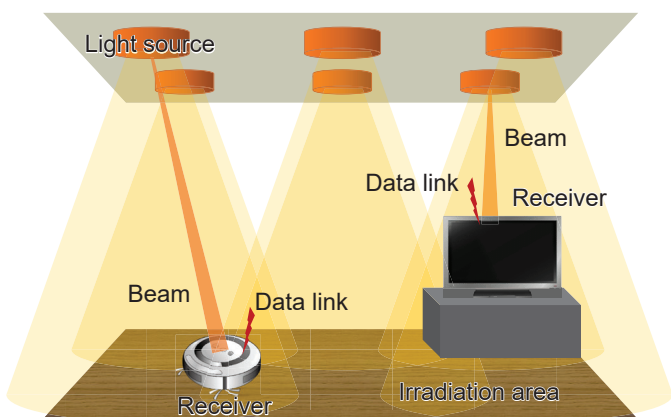


Basic configuration of OWPT

• Main modules are highly efficient light source, solar cell, and optical systems for beam control.

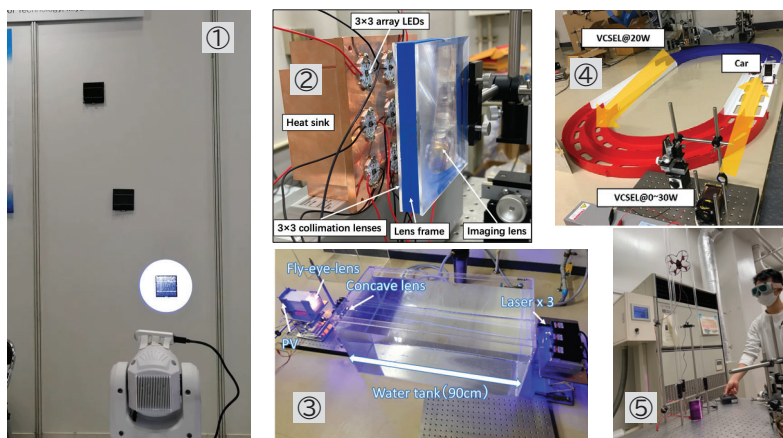
- **Simple system:** Light source, solar cell
- **Small size:** Laser/LED, solar cell
- **Long distance:** from cm to km by beam

- **High output:** up to kW-class by laser
- **Simple circuit:** DC circuit and no EMI
- **Note:** laser safety and low efficiency



Schematic view of indoor OWPT system

- Target applications include not only small terminals, but also all kinds of electric equipment.
- The goal is not only to provide power to fixed devices, but also to provide power to mobile devices.
- The system is superior in terms of system flexibility, wide usage environment, and recoverability, etc.



OWPT prototypes using lasers and LEDs

- ① Power supply for many IoT terminals remotely.
- ② LED array light source for safer and easier to handle.
- ③ Underwater applications using blue lasers.
- ④ Continuous driving of electric vehicles without batteries.
- ⑤ Enables drones to fly for long periods of time.