

# Project Name: International Joint R&D for Multi-Junction Solar Cells Based on Innovative and Novel Structures (2020–2023)



Entrusted party: The University of Tokyo

## Outline of the project

When working toward the realization of a decarbonized society, it is difficult to manufacture solar cells that can spread and expand solar power generation to every corner of society using existing multi-junction solar cells. In this project, research and development of core elemental technologies to realize lightweight and flexible full-spectrum ultra-high efficiency solar cells (target energy conversion efficiency: more than 35%) that can be applied to vehicles and the walls of buildings with low-cost technology will be carried out.

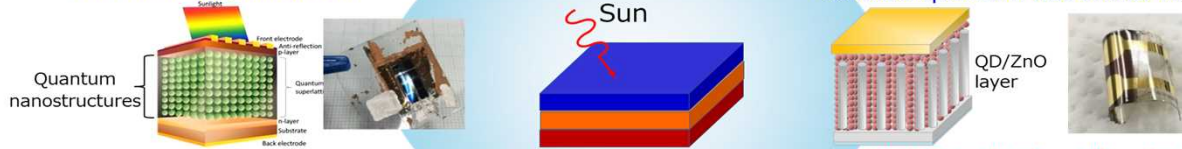
Perovskite cells



High efficiency using solution-based processes

Thin film compound cells

Colloidal quantum dot-based cells



High efficiency and thin films

Utilization of photons from the visible to infrared

High infrared solar cells using colloidal quantum dots

Innovative multi-junction solar cells

## Project scheme

NEDO

Funding

The University of Tokyo (RCAST)

Joint R&D contract

CNRS-IPVF  
Bordeaux Univ.  
(LCPO, IMS)  
(France)

## Expected outcomes

If the replacement of thermal power generation progresses and solar cells developed in this project account for 30% of total solar power generation, the domestic CO<sub>2</sub> reduction effect in 2050 can be estimated to be approximately 28 million tons-CO<sub>2</sub>/year or more. Innovative multi-junction solar cells could be used in application areas that were previously difficult to use with existing solar cells. Furthermore, not only can we expect the creation of new manufacturing technologies and utilization technologies, but also that there will be increased opportunities for entry into the market from industries other than from conventional technical fields.

## Significance of international R&D

CNRS has strengths in the characterization and theoretical calculations regarding the optimal combination of subcells that make up the multi-junction solar cells of the present project and solar cells based on new concepts. The University of Bordeaux has strengths in research and development of organic semiconductors and printed electronics devices. The significance of international joint research is high because the French counterpart and the Japanese side complement each other's scientific and technological capabilities.