

Photoenergy Conversion Systems and Materials for the Next Generation Solar Cells



Research Supervisor
SHUZI HAYASE

Professor
Graduate School of Life Science and Systems Engineering
Kyushu Institute of Technology

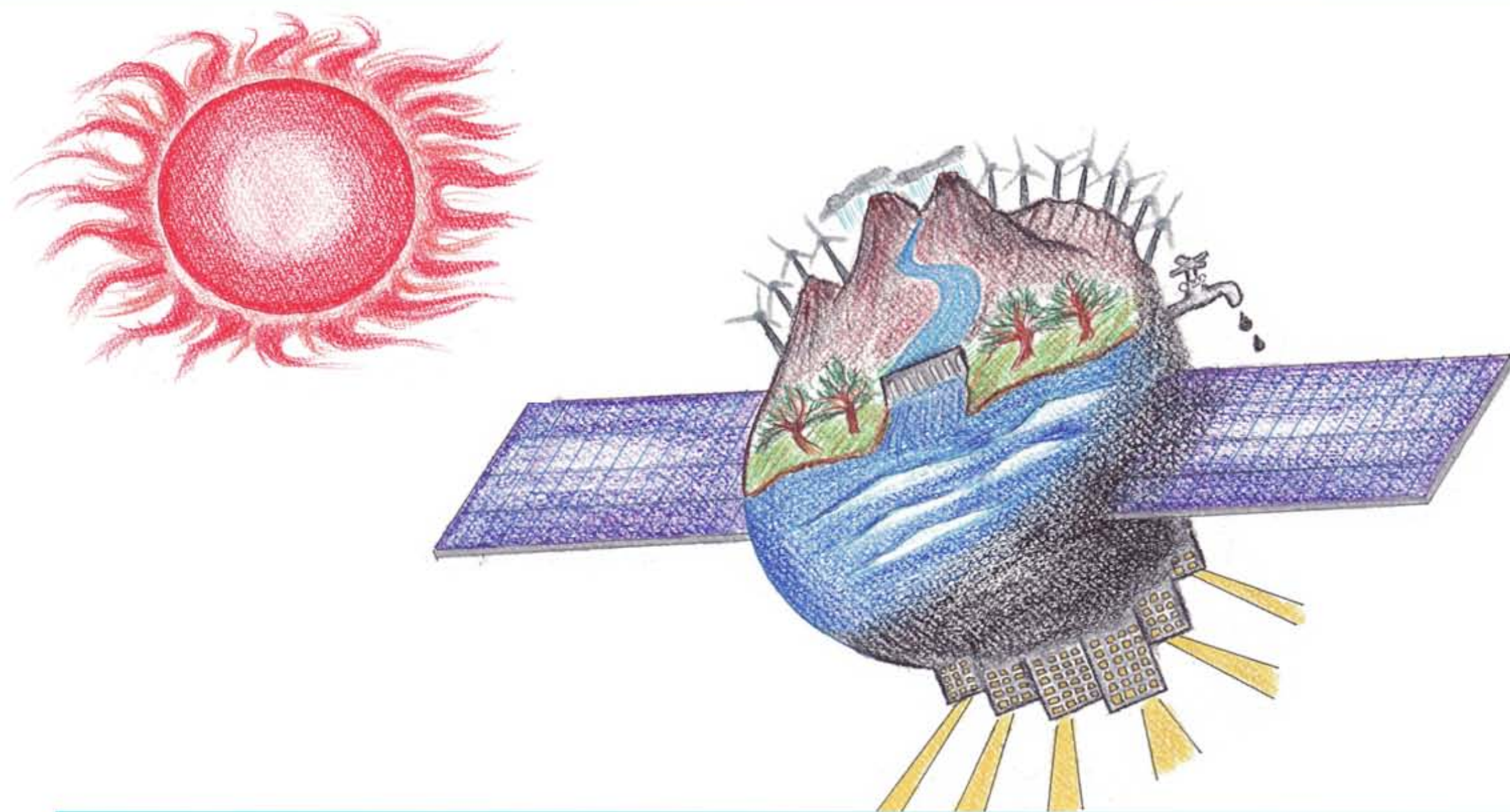
Message

This project is concerning research and development on the next generation solar cells, which started in 2009. Our target is to build up novel concepts leading to the innovative solar cells. Young researchers in variety fields such as chemistry, physics, electronics and so on join this project and discuss the new solar cells across the barrier of these fields.

This project includes devices such as dye-sensitized solar cells, organic thin film solar cells, quantum dot solar cell, new solar cells consisting of Si or compounds, and other innovative solar cells. In addition, fundamental researches such as interfacial control, crystal growth, novel materials and processes for solar cells, and novel cell structures leading to the innovation are also included.

Precursory Research for Embryonic Science and Technology (PRESTO)

Image of Research Area



The image shows that solar energy is the source of all renewable energy on the earth and will supply the driving force to support the world instead of fossil fuels. (by Dr. Koichi Okamoto ;PRESTO Researcher)



KEISUKE OHDAIRA
Japan Advanced Institute
of Science and Technology

Research Theme

“Formation of high-quality polycrystalline silicon films on glass substrates by flash-lamp-induced crystallization”

Presentation Title

“FLASH-LAMP-INDUCED CRYSTALLIZATION OF AMORPHOUS SILICON FILMS IN DIFFERENT EXPLOSIVE CRYSTALLIZATION MODES”



AKINORI SAEKI
Osaka University

Research Theme

“Photogenerated charge carrier dynamics in donor-acceptor films studied by microwave conductivity”

Presentation Title

“WHAT IS THE MAXIMUM CHARGE CARRIER MOBILITY IN BULK HETEROJUNCTION ORGANIC PHOTOVOLTAIC CELLS ? ”



KOICHI OKAMOTO
Kyoto University,
Japan Science and
Technology Agency (JST)

Research Theme

“High-Efficient and Ultra-Thin Solar Cells using Plasmonics”

Presentation Title

“NANOSTRUCTURE-CONTROLLED PLASMONICS TOWARDS HIGH-EFFICIENCY LIGHT-EMITTING DIODES AND SOLAR CELLS”



QING SHEN
The University of
Electro-Communications

Research Theme

“Multiple Exciton Generation in Semiconductor Quantum Dots and its Application to Solar Cells”

Presentation Title

“PHOTOVOLTAIC PROPERTIES AND ULTRAFAST CARRIER DYNAMICS OF CdSe QD SENSITIZED SOLAR CELLS”



TETSUYA TAIMA
National Institute of Advanced
Industrial Science and
Technology

Research Theme

“Development of organic photovoltaic cell fabricated by alternative deposition method for controlling the aggregation and crystallization of organic layers”

Presentation Title

“ORGANIC PHOTOVOLTAIC CELLS BASED ON SMALL-MOLECULAR-WEIGHT SEMICONDUCTORS FOR HIGH OPEN-CIRCUIT VOLTAGE”



SETSUHISA TANABE
Kyoto University

Research Theme

“Wavelength Conversion Material by Quantum Cutting toward Highly Efficient Photovoltaic Generation”

Presentation Title

“QUANTUM-CUTTING DOWNCONVERSION IN Ce³⁺-Yb³⁺ Co-DOPED YAG CERAMICS FOR EFFICIENT PV GENERATION”



DONGLIN JIANG
National Institutes of
Natural Sciences, Institute
for Molecular Science

Research Theme

“Construction of Materials for Light Energy Conversion with Sheet-Shaped Macromolecules”

Presentation Title

“DESIGN AND FUNCTIONS OF TWO-DIMENSIONAL MACROMOLECULES”



KAZUHIRO MARUMOTO
University of Tsukuba

Research Theme

“Elucidation of Degradation Mechanism of Organic Thin-Film Solar Cells from Microscopic Viewpoints and Improvement of Device Durability”

Presentation Title

“IMPROVED EFFICIENCY OF BULK-HETEROJUNCTION ORGANIC THIN-FILM SOLAR CELLS BY ADDING GLYCEROL IN PEDOT:PSS SOLUTIONS FOR FABRICATING BUFFER LAYERS”