

Photovoltaic Science and Technology Research Division

Term: April 1, 2015 – March 31, 2020

Members: 14

Mutsumi Sugiyama, Associate Professor, (Director)

Faculty of Science and Engineering, Department of Electrical Engineering

Toshiaki Yachi, Professor,

Faculty of Engineering Division II, Department of Electrical Engineering

Zhao Xinwei, Professor,

Faculty of Science Division II, Department of Physics

Takashiro Akitsu, Professor,

Faculty of Science Division II, Department of Chemistry

Yoichi Hirata, Professor,

Tokyo University of Science, SUWA, Faculty of Engineering, Department of Electrical and Electronic Engineering

Yasuyuki Watanabe, Associate Professor

Tokyo University of Science, SUWA, Faculty of Engineering, Department of Electrical and Electronic Engineering

Morio Nagata, Associate Professor,

Faculty of Engineering, Department of Industrial Chemistry

Yuzuru Ueda, Junior Associate Professor,

Faculty of Engineering, Department of Electrical Engineering

Junji Kondoh, Associate Professor,

Faculty of Science and Engineering, Department of Electrical Engineering

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Faculty of Industrial Science and Technology, Department of Applied Electronics

Tomoyuki Haraguchi, Assistant Professor,

Faculty of Science Division II, Department of Chemistry

Tokio Nakada, Project Fellow

Research Institute of Science and Technology

Ishwor Khatri, Project Fellow

Research Institute of Science and Technology

Sho Shirakata, Visiting Professor

Ehime University, Graduate School of Science and Engineering

Objectives:

We aim to the development of environmentally friendly technological approaches that can be applied throughout the life cycles of photovoltaic systems, from construction to installation, operation, and disposal.

Research Issues:

(a) The development of organic and inorganic thin film solar cells via environmentally friendly and energy efficient processes.

(b) The fabrication of solar cells that do not incorporate toxic substances such as cadmium and lead with an aim of developing products that are gentle to people and environment.

We do research on solar cells at each stage of the device's life from fabrication to disposal.

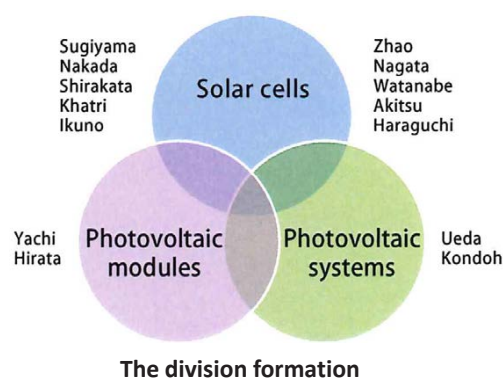
(c) The development of tandem modules with not only using thermal cells but also using wavelength splitting concept in order to harvest the maximum solar radiation spectrum.

(d) The development of solar sharing and modules that will make possible for both power generation and vegetation preservation, thereby, advancing agriculture.

(e) The development of a more efficient photovoltaic generation systems that utilize high-performance energy management technology, which will allow generated electric power to use without waste.

(f) The development of sustainable photovoltaic systems with self-check and self-repair functions that can manage electrical power generation in more efficient way.

(g) The development of the most suitable photovoltaic system and operation technologies based on advanced electric power generation techniques.

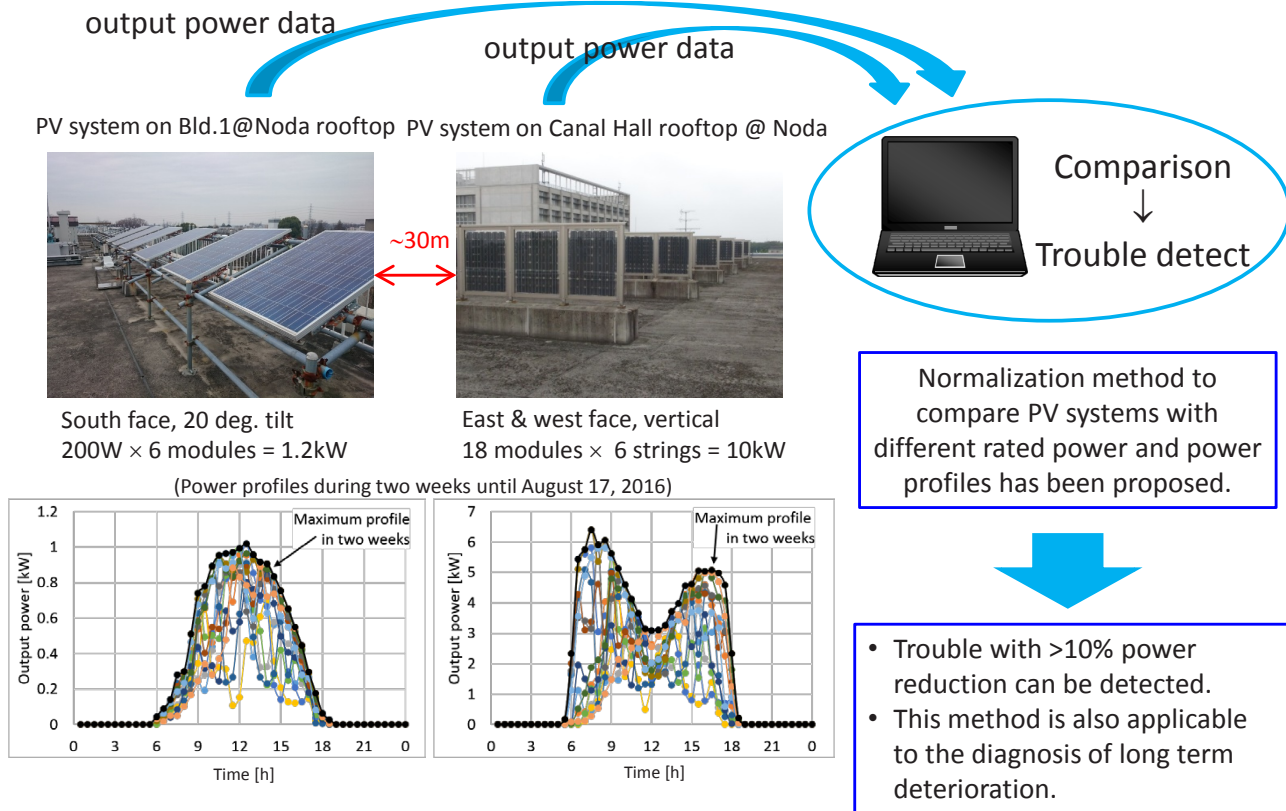


Future Goals:

We will research and develop next-generation photovoltaic systems by utilizing the aggressive synergy of our division members, who are from different research fields of photovoltaic cells and material engineering.

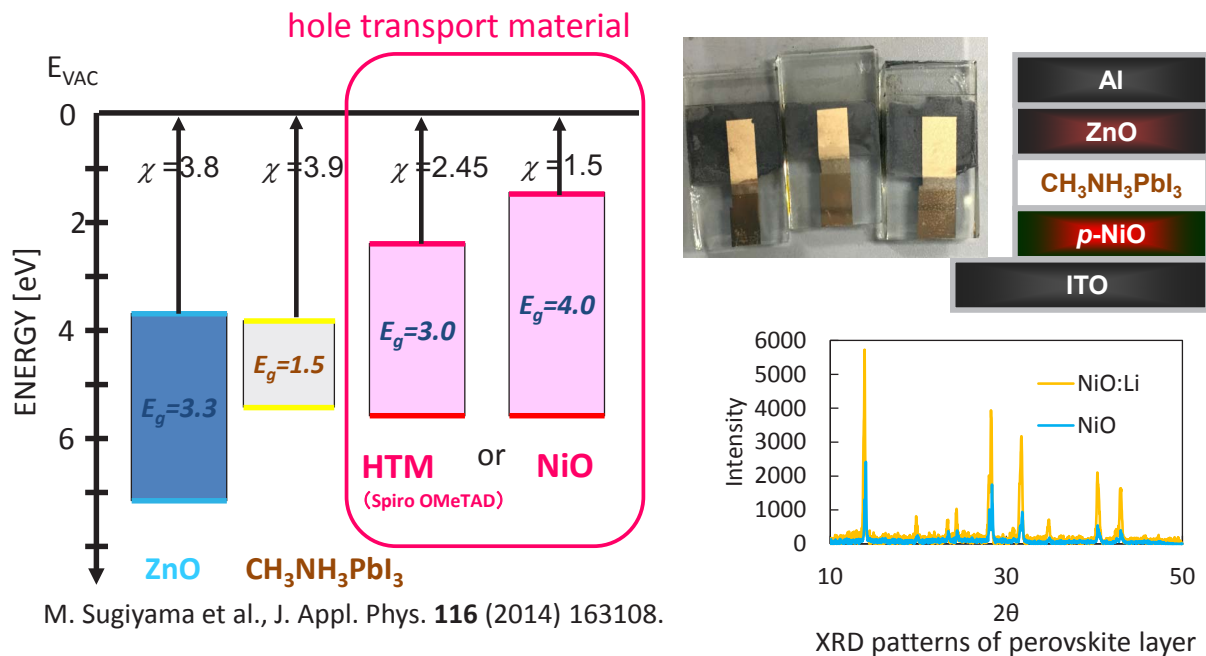
Research Highlight 1

Trouble Detection by Comparing Power Generation with Neighborhood



Research Highlight 2

Fabrication of NiO:Li layer for perovskite solar cells



NiO:Li was used for *p* type electrode on perovskite solar cells instead of the organic material. As a result, the crystallization of the perovskite layer improved and the conversion efficiency of perovskite solar cell improved.