

Lectures, Presentations etc. (Only for subscribers)

SPQEO Journal goes on the rubric “**Lectures, Presentations etc.**” to disseminate information about fundamentals of sciences close to SPQEO directions and areas. The lectures could be both interesting and useful for scientists, PhD students and other persons with an inquiring nature, who is working or studying not only in the area of semiconductor physics, but in solid state physics, chemistry, biology, and informatics, too.

Lecture 1. “Photovoltaics today” by Prof. Vitaliy P. Kostylyov.

Here you can find the following:

- the relevance of photovoltaics;
- energy resources;
- installed capacity in EU and world;
- solar cells / modules efficiency;
- 10 new efficiency records;
- main research area;
- photovoltaic research areas at ISP NASU

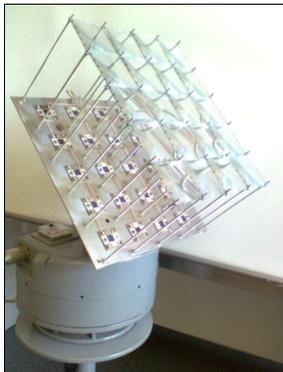
Efficiency is the key.

To further increase efficiency, next-generation technology is required for both silicon and alternative technologies. Although several approaches theoretically give higher efficiency than standard single-junction cells, only one has demonstrated practical benefits, namely the tandem approach.

Silicon may be the leading candidate as the substrate for such cell stacks. The problem is to find thin-film material layers that allow one or preferably more cells to be deposited on silicon to boost efficiency, without compromising the durability of the silicon module.

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- Practical achievements over the recent 15 years
- Work was carried out on the development and fabrication of satellites Solar Arrays for the spacecraft of new generation "Microsputnik".
- Solar Arrays have been developed for power supplying portable dosimetry equipment.
- Experimental samples of a new type of solar cells with rear barriers and contact metallization for use at concentrated solar illumination have been developed and manufactured.
- Simulation of the efficiency of about 10 types of solar cells has been performed.
- Mobile photoelectric and combined photoelectric/wind power plants for autonomous electric power supply of electronic equipment in field extreme conditions.
- Testing Center for Photovoltaic Panels and Photovoltaic Solar Cells was created and certified by the State Standard.



The module of solar power system with solar energy concentration

MODULE PARAMETERS

- concentration degree:	20...25X
- short circuit current, A:	0.466
- open circuit voltage, V:	13.4
- fill factor, rel. un.:	0.819
- output electrical power, W:	5.14