

From Electronics and Photonics Towards Plasmonics and Future Solar Energy Devices

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This talk addresses electronics and the rise of photonics and asks what the future holds in store for these technologies. Through a parallel between these two sciences and an introduction to data transmission, the presentation highlights the latest research on all types of solar cells and photonic devices, and a new approach combining photonics and electronics towards plasmonics and possible future solar energy devices.

The first part presents the fundamentals of solar cells functioning principles and the new trends in solar cells research giving a non-exhaustive list of examples and strategies developed recently in this research area, in order to increase the energy conversion efficiency.

The second part presents the advancements in photonics and photonic devices, including the new materials, the new carriers information vectors (plasmons and surface plasmons polaritons), optical and plasmonics waveguides, lasers, spasers, electro-optical modulators, optical transistors integrated photonics circuits etc.

Beyond simply explaining the existing systems or providing a synthesis of the current state of knowledge, new perspectives for future research are given. Lastly, drawing on the interconnections between electronics and photonics, it suggests a possible means of using solar energy directly with the aid of future photonic/plasmonic devices [1,2].

Keywords: *solar cells, photonics devices, plasmonics, data transmission*

References:

1. M. Girtan, Future Solar Energy Devices, SpringerBriefs in Applied Sciences and Technology (2018)
2. M. Girtan, Is Photonics the new electronics ?, Materials Today 17, 3 (2014) 101

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