

Science and Technology of Light: Recent Developments and Future Directions

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These last decades, optical telecommunications have made a spectacular success thanks to the explosion of Internet. This development is the fruit of a main effort of research and development in the field of guided optics which led to the improvement of the performances of optical fibers and optoelectronic components able to generate, detect, modulate or commutate light. Consequently, optoelectronic components of any kind at low cost become available in the market pushing the emergence of other applications in various fields.

As a matter of fact, today the use of optics includes strategic fields like space and military ones and also fields of everyday life like data storage (CD and DVD), medicine and unsuspected sectors such as car industry. In a competing way, the advent of Nano-Photonics is pushing the limits of photonic devices miniaturization on scales lower than the wavelength.

The interest of using the photon rather than the electron comes from the very high optical frequencies of the optical signal which allow a very broad band-width and offer an unequalled data transmission capacity. Ultimately, the 20th century was the century of electronics and the 21st century is expected to be that of photonics.

This presentation will give a highlight of the main concepts and the recent development of photonics technology as well as future challenges.

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