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## Introduction

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**Biographical notes:** François Flory received his PhD in 1978 and his ‘thèse d’Etat’ in 1985 in light scattering and in the relation between optical properties and the microstructure of thin films, respectively. He is now Professor in Optics at the Ecole Centrale de Marseille. He is editor of the book *Thin Films for Optical Systems* and of more than 150 papers and communications. He has been chairman or member of the scientific committee of more than 15 international conferences. His current research interest is now in the field of micro/nano photonics.

Ludovic Escoubas was graduated from Centrale Marseille (a French ‘Grande Ecole’ of Engineer), and received a PhD in Optics in 1997. He is now Professor at Paul Cezanne University (Marseille – France) and leader of the OPTO-PV Team (“Optoelectronics Components and Photovoltaics”) of IM2NP (CNRS Laboratory). His current research interests are micro and nano optical components and solar cells. He has authored more than 150 papers and communications and holds six patents.

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Recent developments in nanophotonics lead to many fascinating new applications.

Modelling and technology progresses allow the development of artificial materials with tailored optical properties (absorption, saturation intensity, dynamic response, tailored reflection, scattering, dispersion ...) which are likely to affect all fields of photonics in research and industry.

Using metals, semiconductors or dielectrics, different fields such as plasmonic, quantum dots or photonic crystals showing very good promises and already giving new components have been developed.

Applications concern as well photonics circuits as light sources, photovoltaic cells, sensors, optical computing, data storage ... for telecommunications, displays, computers, environment, health, defence...

This special issue of the *International Journal of Materials and Product Technology* dedicated to nanophotonics aims at presenting some of the latest results of the field given by high level specialists.

'Structured surfaces and applications' by Gérard Berginc presents structured surfaces and their applications to absorption and transmission enhancement of optical waves.

'Nanostructured MOEMS for spatial and spectral control of light' by S. Boutami et al. describes the recent evolution of electrically actuatable MOEMS, interferometric devices based on a deformable stack of Indium Phosphide membranes, from a simple one-dimensional (1D) structure towards a new class of MOEMS devices (PC-MOEMS). PC-MOEMS are combining two-dimensional (2D) photonic crystals formed in in-plane wave-guiding membranes and the 1D multilayer stack.

'Bidimensional Photonic Crystals for integrated optics' by Anne Talneau concerns some typical optical devices implementing 2D Photonic Crystals.

'The role of index contrast in dielectric optical waveguides' by Andrea Melloni et al. shows how refractive index contrast plays a fundamental role in determining the characteristics of an optical dielectric waveguide and how a higher index contrast permits to move towards larger scales of integration of photonic integrated circuits and to access new devices and functionalities.

'Pulsed Laser Deposition: passive and active waveguide' by Miroslav Jelínek et al. presents an overview of waveguiding thin films fabricated by pulsed laser deposition (PLD) and their applications.

In the paper 'Organic Light Emitting Diodes: materials, device structures and light extraction' by Bernard Geffroy and Licinio Rocha. Organic Light-Emitting Devices (OLEDs) are presented with particular emphasis on materials, device structures and strategies to improve light extraction.

'Optical properties engineering for Organic Solar Cells' by Jean-Jacques Simon et al. explains how photonics has stimulated researches and news experimental approaches to improve photovoltaic conversion in organic solar cells.

Jérôme Wenger et al. review the exciting applications of sub-wavelength apertures towards the sensitive and specific characterisation of molecules in their paper 'Biophotonics applications of nanometric apertures'.