Special Issue on Surface Plasmon Photonics

THE field of surface plasmon photonics has experienced continuous growth over the last decade. On one hand, this growth has been triggered by progress in nanofabrication, nanoanalysis, and computing, which strongly widened our capabilities to fabricate, analyze, and understand metal nanostructures to generate and manipulate surface plasmon fields. On the other hand, plasmonics began to impact many fields of technological relevance as integrated optics, photovoltaics, solid state lighting, or biosensors, just to name a few.

The focus of this Special Issue is to provide an overview of the state of the art in plasmonics experimental and theoretical research. Containing 18 papers, 6 invited and 12 contributed, this issue is structured in the following three sections.

1) Active Plasmonics.
2) Plasmonic Waveguides.
3) Plasmonic Nanostructures.

In these sections, the key issues in actual plasmonics research are discussed, from the interaction of surface plasmons with optical emitters to waveguiding concepts and the concentration of surface plasmon fields to nanoscale dimensions. We hope that the readers will find this compilation interesting and informative and that it is a useful reference for the future development of surface plasmon photonics.

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1. Introduction. Surface plasmon polaritons are electromagnetic modes with a locally enhanced electric field. These modes are expected to become the key for the development of photonics of the 21st century and thus the applications of surface plasmon polaritons have become a worldwide target to be studied. In particular, localized surface plasmons (LSP's) have been widely studied as a key electromagnetic mode to develop nano-photonic technology [1-12].Â The reduction of the SPP wavelength close to the surface plasmon polariton resonance is the reason why SPPs are being thoroughly investigated as a way to achieve subwavelength two-dimensional optics.3, 4.