**Plasmonics – A Vision for the Future**

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**Abstract :**

Plasmonics is quickly becoming a dominant technology for the twenty-first century. The classic text by H. Raether appeared in 1988, but the potential of surface plasmons laid dormant for a decade. It is now recognized that surface plasmons, which can be present on particulate, smooth, or corrugated metallic surfaces, have enormous potential in the fields of optical computing, novel optical devices, and more recently biological and medical research. These emerging applications are the result of the unique properties of surface plasmons, which are confined in a two-dimensional surface and can have dimensions considerably smaller than optical wavelengths. Surface plasmons can be, to a reasonable extent, controlled in two dimensions, trapping and transporting optical energy in nanoscale structures. At first glance this possibility seems similar to optical wavelengths. However, typical optical waveguides, in contrast to plasmonics devices, must be three-dimensional and have wavelength-size features. Additionally, the two dimensional nature of plasmonic structures makes them compatible with modern lithographic methods used for preparation of integrated circuits.

The potential of plasmonics in chemical and biological research is just now being realized. One early application is surface enhanced Raman scattering (SERS), the mechanism of which is still a subject of investigation. Another known application of plasmonics is surface plasmon resonance (SPR), which is used to study biomolecule binding reactions. SERS and SPR depend on the two extremes of metallic structures, random particles and a smooth surface. The applications and understanding of plasmonics are now being facilitated by modern nanofabrication technologies, which allows preparation of numerous metallic nanostructures, in particular regular patterns of particles, holes, or other features. These metallic nanostructures are already known to display unusual and unexpected optical properties, such as anomalously larger optical transmission through subwavelength nanoholes and directional rather than diffracted light transmission. Additionally, these are strong optical fields with subwavelength dimensions near such structures. These fields provide opportunities for new experimental capabilities such as sub wavelength optical imaging.

Plasmonics is a highly interdisciplinary science that depends on the efforts of physicists, chemists, and biologists. Many sub disciplines are involved, such as computational electrodynamics, nanofabrication, bottom up chemical self-assembly and biochemical spectroscopy, to name a few. Consequently, and perhaps appropriately, the many new results using plasmonics are appearing diffusively in many journals. Given the breadth and potential of plasmonics technology, it is now time for a journal dedicated to this important new science. We are thus pleased to introduce Plasmonics, a peer-reviewed journal to serve as the focal point for the principles and applications of surface plasmons.

The scope of plasmonics covers all aspects of the properties of free electrons oscillation in metals and the interactions of these plasmons with the surrounding environment. The topics include advances in the theory, physics, and applications of surface plasmons to the rapidly emerging areas of nanotechnology, bio photonics, sensing, biochemistry, and medicine.

We hope Plasmonics in future becomes successful and helps growing technology.

Many Thanks.