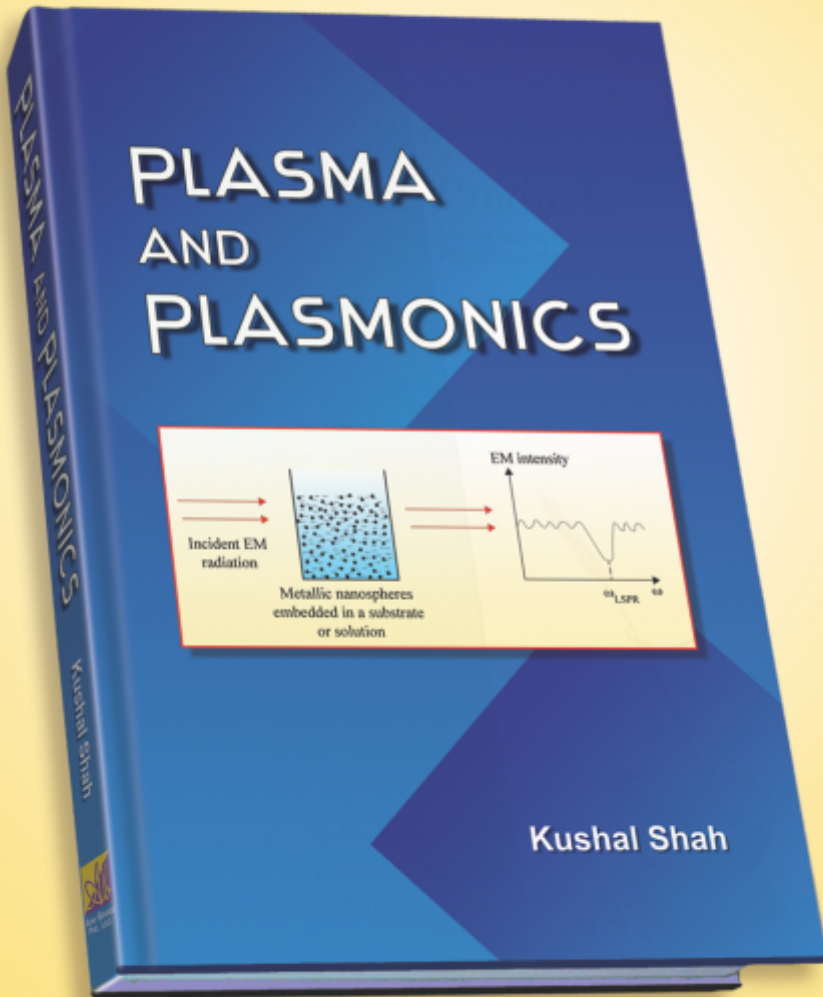




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# Plasma and Plasmonics

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**Kushal Shah**

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# Plasma and Plasmonics

**About the Book:** Plasmonics is the study of electromagnetic waves that travel along the interface between a metal and dielectric. The existence of these waves require the metal to have a negative permittivity, which is usually possible in the visible light and ultraviolet frequency range. At these frequencies, the metal essentially behaves like a quasi-neutral plasma with free electrons moving over a fixed lattice of ions. In fact, the term 'plasmonics' stands for quantized plasma oscillations. This book introduces the reader to the basics of plasmas and plasmonics, along with the required background in Maxwell's equations. Several of the futuristic applications of plasmonics will have to extensively use knowledge of plasma dynamics in order to further exploit the metal properties in this frequency range. This book also covers some basic mathematical and computational concepts required for solving Maxwell's equations and analysing various other phenomenon related to plasmas and plasmonics.

**Contents:** *Preface*, 1. Maxwell's Equations 2. Electromagnetic Properties of Metals 3. Plasma Kinetic Theory 4 Plasma Fluid Theory 5. Surface Plasmon Polaritons (SPP)

6 Spoof Surface Plasmons (SSP) 7 Advanced Topics in Plasmonics 8. Mathematical Foundations 9. Numerical Methods for Electromagnetics, *Appendix : Legendre Polynomials, Bibliography*

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