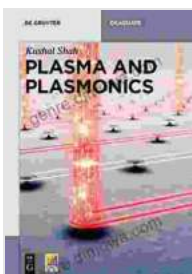


# Plasma And Plasmonics (De Gruyter Textbook)

Plasma and plasmonics are rapidly emerging research fields that have attracted significant attention over the past decades. Plasma is an ionized gas that is composed of free electrons and ions. Plasmonics is the study of the interaction between light and plasma.

This textbook provides a comprehensive to plasma and plasmonics. It covers the basic concepts of plasma physics, including the kinetic theory of plasmas, the magnetohydrodynamic equations, and the wave propagation in plasmas. It also covers the basics of plasmonics, including the surface plasmon polaritons, the localized surface plasmons, and the metamaterials.

This textbook is written for senior undergraduate students and graduate students in electrical engineering, physics, and materials science. It is also a valuable resource for researchers working in the fields of plasma physics, plasmonics, and nanophotonics.



## Plasma and Plasmonics (De Gruyter Textbook)

★★★★★ 5 out of 5

Language : English

File size : 5380 KB

Text-to-Speech: Enabled

Print length : 169 pages

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### What is Plasma?

Plasma is the fourth state of matter, after solids, liquids, and gases. It is an ionized gas that is composed of free electrons and ions. Plasma is often referred to as the "soup of the universe" because it is the most common state of matter in the universe.

Plasma is created when a gas is heated to a very high temperature. This causes the atoms in the gas to lose their electrons. The free electrons and ions then form a plasma. Plasma can also be created by other means, such as by applying an electric field to a gas.

Plasma is a very good conductor of electricity. This makes it a useful material for a variety of applications, such as in plasma displays, plasma cutters, and plasma engines.

### **What is Plasmonics?**

Plasmonics is the study of the interaction between light and plasma. Plasmons are waves of electrons that can propagate along the surface of a metal. Plasmons are very sensitive to the optical properties of the metal, such as its permittivity and conductivity.

Plasmonics has a wide range of applications, such as in optical imaging, sensing, and metamaterials. Plasmonic devices can be used to create very small and efficient optical devices.

### **Applications of Plasma and Plasmonics**

Plasma and plasmonics have a wide range of applications in a variety of fields, including:

- **Energy:** Plasma is used in fusion reactors to generate electricity. Plasmonics can be used to create more efficient solar cells and light-emitting diodes (LEDs).
- **Medicine:** Plasma is used in plasma cutters to perform surgery. Plasmonics can be used to create new imaging techniques and drug delivery systems.
- **Electronics:** Plasma is used in plasma displays and plasma engines. Plasmonics can be used to create new types of transistors and other electronic devices.
- **Optics:** Plasma is used in lasers and fiber optics. Plasmonics can be used to create new types of optical devices, such as metamaterials and plasmonic lenses.

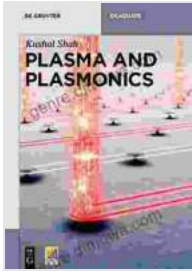
## Future of Plasma and Plasmonics

Plasma and plasmonics are rapidly emerging research fields that have the potential to revolutionize a wide range of technologies. As our understanding of plasma and plasmonics continues to improve, we can expect to see even more exciting and innovative applications of these technologies in the future.

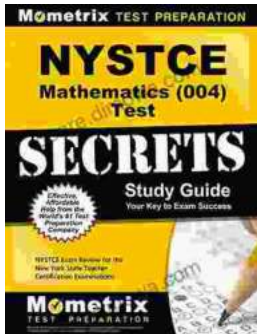
Plasma and plasmonics are two of the most rapidly emerging research fields in science today. These fields have the potential to revolutionize a wide range of technologies, from energy to medicine to electronics. This textbook provides a comprehensive to plasma and plasmonics, making it an essential resource for students and researchers in these fields.

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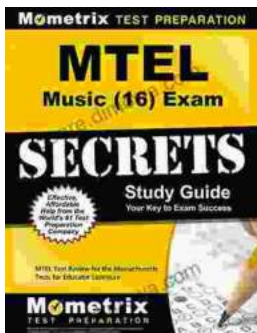


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