



# Modern Introduction to Surface Plasmons: Theory, Mathematica Modeling, and Applications

*By Dror Sarid, William A. Challener*

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## **Modern Introduction to Surface Plasmons: Theory, Mathematica Modeling, and Applications** By Dror Sarid, William A. Challener

Introducing graduate students in physics, optics, materials science and electrical engineering to surface plasmons, this book also covers guided modes at planar interfaces of metamaterials with negative refractive index. The physics of localized and propagating surface plasmons, on planar films, gratings, nanowires and nanoparticles, is developed using both analytical and numerical techniques. Guided modes at the interfaces between materials with any combination of positive or negative permittivity and permeability are analyzed in a systematic manner. Applications of surface plasmon physics are described, including near-field transducers in heat-assisted magnetic recording and biosensors. Resources at [www.cambridge.org/9780521767170](http://www.cambridge.org/9780521767170) include Mathematica code to generate figures from the book, color versions of many figures, and extended discussion of topics such as vector diffraction theory.

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"... the authors have provided an accessible source to the rapidly developing field of plasmonics... the material presented will amply fulfill the requirements of graduate students in the many disciplines that use plasmonics. The book is well illustrated, and overall it is prepared to an extremely high standard."

K. Alan Shore, Optics and Photonics News

#### **About the Author**

Dror Sarid is Professor and former Director of the Optical Data Storage Center at the College of Optical Sciences, the University of Arizona. He participated in the development of the field of surface plasmons, identifying the long- and short-range surface plasmons and their important applications in science and technology.

William Challener is a Research Scientist at Seagate Technology. He has worked on optical and magnetic data storage materials and systems, and various chemical and biological sensors employing surface plasmons and other evanescent wave optics.

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