



# Smart Electronic Materials: Fundamentals and Applications

*By Jasprit Singh*

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## Smart Electronic Materials: Fundamentals and Applications By Jasprit Singh

Smart materials respond rapidly to external stimuli to alter their physical properties. They are used in devices that are driving advances in modern information technology and have applications in electronics, optoelectronics, sensors, memories and other areas. This book fully explains the physical properties of these materials, including semiconductors, dielectrics, ferroelectrics, ferromagnetics and organic polymers. Fundamental concepts are consistently connected to their real-world applications. It covers structural issues, electronic properties, transport properties, polarization-related properties and magnetic properties of a wide range of smart materials. The book contains carefully chosen worked examples to convey important concepts and has many end-of-chapter problems. It is written for first year graduate students in electrical engineering, materials science or applied physics programs. It is also an invaluable book for engineers working in industry or research laboratories. A solution manual and a set of useful viewgraphs are also available for instructors.

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### **Editorial Review**

#### **Review**

Smart Electronic Materials is a valuable guide for instructors who want to design their own courses on smart materials...mostly succeeds in its aim of offering readers basic skills to understand properties of diverse materials relevant in today's information-technology-based society."

Siegfried Bauer, Physics Today

#### **About the Author**

Jasprit Singh obtained his PhD in Solid State Physics from the University of Chicago. He is currently a professor in the Applied Physics Program and in the Department of Electronic and Computer Science at the University of Michigan, Ann Arbor. He has held visiting positions at the University of California, Santa Barbara. He has authored over 250 technical articles. He has also authored 8 textbooks in the area of applied physics and technology. His area of expertise is novel materials for applications in intelligent devices.

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