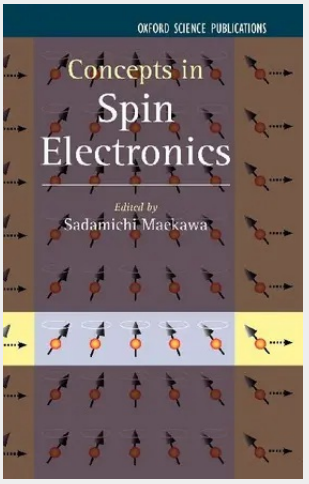
Maekawa

Concepts in Spin Electronics

Nowadays information technology is based on semiconductor and ferromagnetic materials. Information processing and computation are based on electron charge in semiconductor transistors and integrated circuits, and information is stored on magnetic high-density hard disks based on the physics of the electron spins. Recently, a new branch of physics and nanotechnology, called magneto-electronics, spintronics, or spin electronics, has emerged, which aims at simultaneously exploiting both the charge and the spin of electrons in the same device. A broader goal is to develop new functionality that does not exist separately in a ferromagnet or a semiconductor. The aim of this book is to present new directions in the development of spin electronics in both the basic physics and the technology which will become the foundation of future electronics.

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