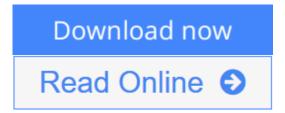


Introduction to the Electron Theory of Metals

By Uichiro Mizutani



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This text presents a complete account of electron theory in both periodic and nonperiodic metallic systems. The author's accessible approach allows for comparisons with experimental results as much as possible. The book starts with the basics of one-electron band theory and progresses to cover high Tc superconductors and quasicrystals. The relationship between theory and potential applications is also emphasized. The material assumes some knowledge of elementary quantum mechanics as well as the principles of classical mechanics and electromagnetism. Numerous exercises and an extensive list of references and numerical data are key features.





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Introduction to the Electron Theory of Metals By Uichiro Mizutani Bibliography

• Sales Rank: #3911057 in Books

• Brand: Brand: Cambridge University Press

Published on: 2001-07-02Original language: English

• Number of items: 1

• Dimensions: 9.72" h x 1.22" w x 6.85" l, 2.78 pounds

• Binding: Paperback

• 604 pages



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Editorial Review

About the Author

Uichiro Mizutani was born in Japan on March 25, 1942. During his early career as a postdoctoral fellow at Carnegie-Mellon University from the late 1960s to 1974, he studied the electronic structure of the Hume-Rothery alloy phases. He received a doctorate of Engineering in this field from Nagoya University in 1971. Together with Professor Thaddeus B. Massalski, he wrote a seminal review article on the electron theory of the Hume-Rothery alloys (Progress in Materials Science, 1978). From the late 1970s to the 1980s he worked on the electronic structure and transport properties of amorphous alloys. His review article on the electronic structure of amorphous alloys (Progress in Materials Science, 1983) provided the first comprehensive understanding of electron transport in such systems. His research field has gradually broadened since then to cover electronic structure and transport properties of quasicrystals and high-Tc superconductors. It involves both basic and practical application-oriented science like the development of superconducting permanent magnets and thermoelectric materials. He became a professor of Nagoya University in 1989 and was a visiting professor at the University of Paris in 1997 and 1999. He received the Japan Society of Powder and Powder Metallurgy award for distinguished achievement in research in 1995, the best year's paper award from Japan Institute of Metals in 1997 and the award of merit for Science and Technology of High Tc-Superconductivity in 1999 from the Society of Non-Traditional Technology, Japan.

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