



# Density Waves In Solids (Frontiers in Physics)

By George Gruner

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"*Density Waves in Solids* is written for graduate students and scientists interested in solid-state sciences. It discusses the theoretical and experimental state of affairs of two novel types of broken symmetry ground states of metals, charge, and spin density waves. These states arise as the consequence of electron-phonon and electron-electron interactions in low-dimensional metals. Some fundamental aspects of the one-dimensional electron gas, and of the materials with anisotropic properties, are discussed first. This is followed by the mean field theory of the phases transitions—discussed using second quantized formalism—together with the various experimental observations on the transition and on the ground states. Fluctuation effects and the collective excitations are reviewed next, using the Ginzburg-Landau formalism, followed by the review of the interaction of these states with the underlying lattice and with impurities. The final chapters are devoted to the response of the ground states to external perturbations.

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### **About the Author**

George Gruner graduated from the Eotvos Lorand University, Budapest. From 1973 he served as Department Head at the Central Research Institute of Physics in his native Hungary. Since 1981 he has been Professor of Physics at the University of California, Los Angeles. He has been a visiting professor and consultant at several universities and research laboratories.

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