

<<磁性>>

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前言

This book emerged from a close collaboration of the authors which started in the fall of 2000. Early that year one of us (J.S.) had joined the Stanford faculty after spending nearly 15 years at the IBM Almaden Research Center and the other (H.C.S.) had just retired from a chair at the ETH Zurich and come to Stanford as a visiting professor. Together we organized magnetism meetings of a small group of scientists which oscillated weekly between the Stanford Synchrotron Radiation Laboratory (SSRL) and the Advanced Light Source (ALS) in nearby Berkeley. We also organized annual winter workshops at Lake Tahoe where all participants reported on their research - of course we snuck in a few ski runs, as well. These meetings were great fun and some seemed to go on forever because there was so much interest and enthusiasm and so much to discuss... The participants varied over the years and consisted of students, postdocs, Stanford and Berkeley scientists, visiting scientists and participants from industry. In alphabetical order, some of the people involved were Yves Acremann, Scott Andrews, Andreas Bauer, Mark Burkhardt, Venkatesh Chembrolu, Kang Chen, Sug-Bong Choe.

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内容概要

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插图：atomic level. The seminal contribution of neutron techniques to magnetism is reflected by the October 1994 press release by the Royal Swedish Academy of Sciences on the 1994 Nobel Prize in Physics, won by Bertram N. Brockhouse (1918-2003) and Clifford G. Shull (1915-2001) , "Neutrons are small magnets, as are the atoms of a magnetic material. When a neutron beam strikes such material, the neutrons can therefore change direction through magnetic interaction with the atoms of the material. This gives rise to a new type of neutron diffraction which can be used to study the relative orientations of the small atomic magnets. Here, too, the X-ray method has been powerless and in this field of application neutron diffraction has since assumed an entirely dominant position. It is hard to imagine modern research into magnetism without this said." At the time of this press release efforts were already underway to change the role of X-rays in magnetism. This relatively recent and important development will be discussed later. The last 30 years have seen another important development, the generation and manipulation of spin polarized electrons [45]. This development has culminated in phenomena like giant magnetoresistance and "spintronics". We shall see later that studies by means of polarized electrons and X-rays have provided important new information. Today one could rephrase the last sentence of the above quote by the Nobel Prize Committee: It is hard to imagine modern research into magnetism without polarized electron and X-ray probes.

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