

PREFACE

The maturing of X-ray astronomy as an observational science is reflected in the increasing emphasis being placed upon high resolution spectroscopy. Gas at temperatures from 10^6 to 10^8 K is found in cosmic environments ranging in scale from the coronae of stars to the medium between members of a rich cluster of galaxies. It is also found in accretion disks of compact objects, supernova remnants, and active galactic nuclei. Thermal X-ray emission characterised by lines and edges is a prominent feature of these objects. Hence, a great deal of effort is being devoted to improving theoretical models for the interpretation of spectroscopic observations. As the power of high resolution X-ray spectroscopy to elucidate astrophysical conditions becomes more widely appreciated experimenters are making significant improvements to the sensitivity and resolution of instruments.

X-ray spectroscopy is an important objective of virtually every new major national and international mission in X-ray astronomy that is now being planned or under discussion. These initiatives include ASTRO-D (Japan), SAX (Italy) *Spectrum-X-Gamma* (USSR), AXAF (USA), XMM (European Space Agency), and a spectroscopic successor to ROSAT (Germany). *In toto*, X-ray astronomy missions account for a very large fraction of the total resources that the world will devote to astronomy from space over the next two decades.

IAU Colloquium 115 was the first major international meeting to provide a comprehensive forum with a cosmic focus for all aspects of high resolution X-ray spectroscopy. The sequence of papers ranges from detailed theoretical models of X-ray emission, to observational results, to instrument concepts for the future. This collection should serve as an introduction, as well as a comprehensive review of the current status of high resolution spectroscopy in a cosmic setting.

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