

neutron star.

In the first half of his book on neutron stars, Peter Mészáros, an expert on radiative transfer in magnetic neutron star atmospheres, derives in varying degrees of technical detail the processes found in a strong magnetic field. He uses nonrelativistic quantum mechanics to discuss much of the relevant physics, such as the quantum states of a free electron and of an atom when the magnetic

force exceeds the electric force. The most advanced and detailed discussions require an understanding of relativistic quantum mechanics. These discussions cover the dielectric tensor in a strong magnetic field for the vacuum and for a plasma; fundamental radiative processes such as cyclotron emission and resonant Compton scattering; unique processes such as photon splitting and single photon pair creation; and the solu-

tions of radiative transfer equations for a polarizing medium.

Mészáros devotes the second half of his book to a survey of the astronomical systems that motivate strong magnetic field physics: accretion-powered pulsars, spin-powered pulsars and gamma-ray bursts. This discussion is accessible to all graduate students in astrophysics. As an introduction to pulsars this book is adequate, but those conducting research on pulsars will want additional references, such as the recent books by F. Curtis Michel (U. Chicago P., 1991) and by A. G. Lyne and Francis Graham-Smith (Cambridge U. P., 1990), which cover the subject in much greater detail. The once-favored galactic neutron star model of gamma-ray bursts, which spurred many researchers, including myself, to develop the physics of processes in strong magnetic fields, is the only gamma-ray burst model discussed in Mészáros's book. Unfortunately for Mészáros, after he had finished writing this book, the Compton Gamma Ray Observatory produced evidence favoring cosmological models. This book is foremost a book on accretion-powered pulsars. The link between theory and observation is strong for these systems, and Mészáros nicely presents the relevant observations and discusses the most recent theoretical work.

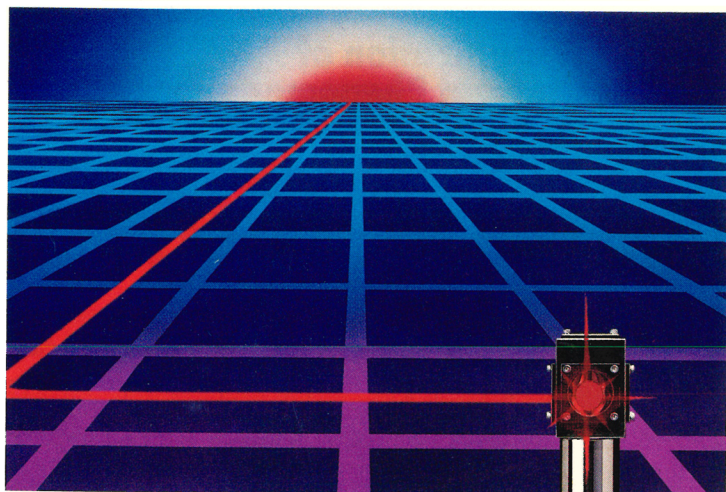
Two additional topics discussed in this book are the models for gamma rays observed above 1 TeV from x-ray binaries and the evolution of accreting pulsar systems. The references are fairly complete for the past two decades. On balance this is a fine book that draws together much of the recent research literature, and it will be a standard reference for those working on accretion-powered pulsars.

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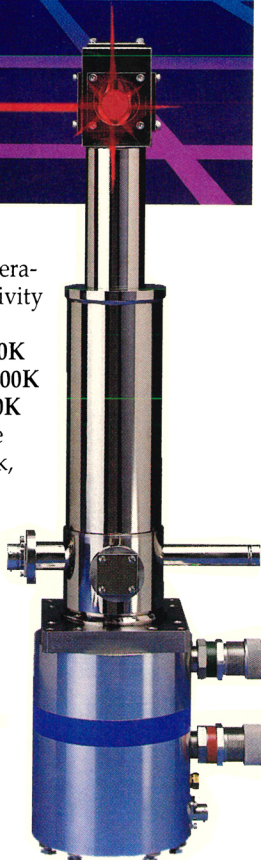
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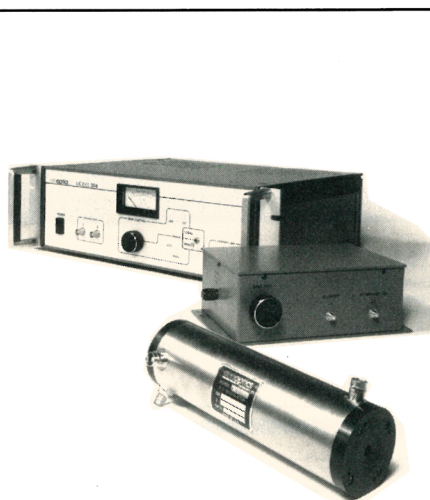
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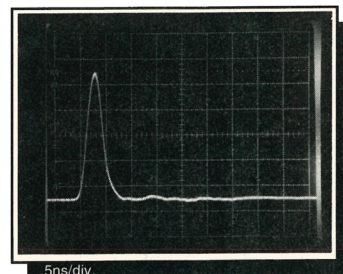


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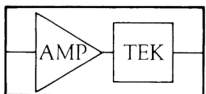
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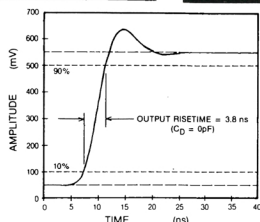
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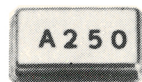
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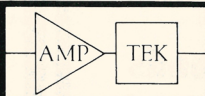
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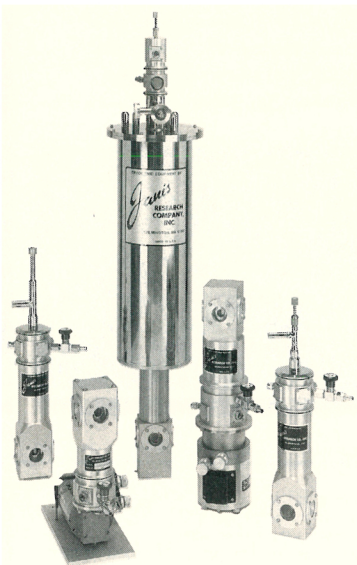
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