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**Atomic Processes in X-ray Photoionized Gas**

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It has long been known that photoionization and photoabsorption play a dominant role in determining the state of gas in nebulae surrounding hot stars and in active galaxies. Recent observations of X-ray spectra demonstrate that these processes are also dominant in highly ionized gas near compact objects, and also affect the transmission of X-rays from the majority of astronomical sources. This has led to new insights into the understanding of what is going on in these sources. It has also pointed out the need for a better atomic cross sections for photoionization and absorption, notably for processes involving inner shells. In this talk I will discuss these issues, what is known and where more work is needed.