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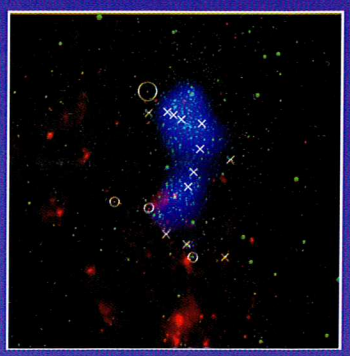
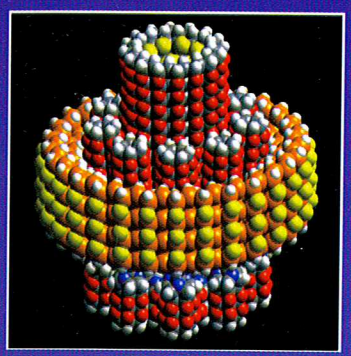
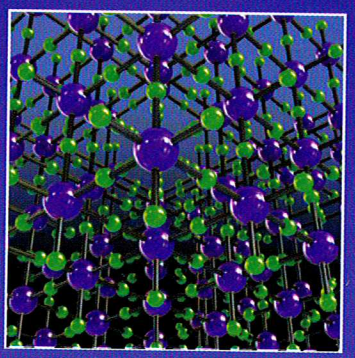
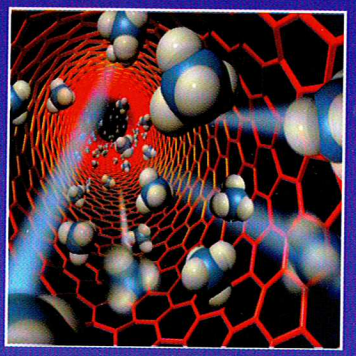

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Photoionization, Photoexcitation and Astrophysical Opacities: The Iron Project

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Radiation transport through astrophysical plasmas is carried out by photon absorptions and emissions by the elements in the plasma and gives a measure of the plasma opacity. The dominate radiaitve atomic processes that govern opacity are photoionization and photoexcitations. The monochromatic opacity $\kappa(\nu)$ at a photon frequency ν in a plasma depends on the atomic parameters, oscillator strengths (f) and photoionization cross sections (σPI), of these processes. However, total monochromatic opacity is determined by the summed contributions of all possible radiative transitions from all ionization stages of all elements in the plasma source and hence requires large amount of atomic data. Accuracy of these data is crucial for accuracy of opacity. Accuracy in atomic parameters is also essential for various diagnostics of astrophysical plasmas. I will present results of photoionization and oscillator strengths from the recent developments in theoretical quantum mechanical calculations, under the international Iron Project and their impact on the astrophysical opacities and other astrophysical problems.

Acknowledgement

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