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Photoionization and Structure of the Superheavy Atom Cn (Z=112) A. K. RAZAVI, D. A. KEATING, S. T. MANSON, Georgia State U., P. C. DESHMUKH, IIT-Tirupati — Calculations of the structure and photoionization of the closed-shell superheavy Copernicium (Cn) atom have been performed using Dirac-Fock (DF) and relativistic-random-phase approximation (RRPA) methods. Although Cn is Hg-like, the ordering of the outer and near-outer subshells is rather peculiar owing to the strength of relativistic interactions at such high Z, e.g, the valence subshell is $6d_{3/2}$ and the 5f thresholds are found to lie between $6p_{3/2}$ and $6p_{1/2}$. Specifically, the ordering of the levels is hydrogenic from the 1s up to the 6s subshell. But interlopers are found between the levels of spin-orbit doublets; the ordering of the outer subshells is found to be $6p_{1/2}$, $5f_{5/2}$, $5f_{7/2}$, $6p_{3/2}$, $6d_{3/2}$, 7s, $6d_{3/2}$. The binding energies of last three subshells are quite close to each other, but this result confirms a previous calculation [1]. Photoionization cross sections and angular distributions have been obtained for each subshell from threshold to about 1,400 eV and the results show that interchannel coupling dominates the photoionization process over much of the energy region. [1] J. Li *et al*, Science in China: Ser. G-Phys. Mech. Astr. **50**, 707 (2007).

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