The Old and the New - Complementary uses of CPK and 3D Printed Atom Models

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Most students today become familiar with molecules via computer displays. I believe this method fails to convey the "physicality" of these objects and results in researchers who do not have an intuitive sense of either the excluded volume which results from van der Waals forces or the shapes which result from various hybridization states of s and p orbitals. Long ago CPK (Corey-Pauling-Koltun) atomic models were commonly used for instruction, and they are still available for purchase. While these model parts are still very useful they have limitations, but these can be overcome with 3D printed atomic models. The two types of models are complementary - While CPK models demonstrate well the conformation variability of a molecule allowed by rotation about single bonds limited by van der Waals repulsion, a 3D printed model can incorporate unusual or strained geometry. Familiarity with the monomers of macromolecules and the small molecules which bind to them is vital for crystallographers building models into density or potential maps.

In this talk I'll show a number of models of each type, each with a story of its own.

(This talk would work best as the last talk before a break so the audience can come up and experience the models personally. More than ten minutes could be put to good use.)