# The Electronic Rydberg and Valence Structures of Molecular Oxygen

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The spectra and electronic structures of molecular oxygen play dominant roles in many terrestrial and astrophysical processes. The details of these processes are governed, in turn, by the details of the molecular potentials of the electronic states involved. As part of a comprehensive review of the electronic structure of molecular oxygen currently nearing completion, data on all known valence and Rydberg states is being compiled and correlated. This presentation emphasizes both a summary of our current understanding of the valence electronic states as well as the complex electronic potentials which arise from the interaction between the Rydberg-Rydberg and Rydberg-valence states. Application of these electronic structures to typical problems of atmospheric interest as well as problems encountered in published experimental characterizations of the Rydberg states of g-symmetry will be emphasized.