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Orion's Veil: A Laboratory for Understanding Physical Processes in the Interstellar Medium

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Orion's Veil is a foreground cloud of gas and dust which is directly along the line of sight towards the Orion Nebula, and is the primary cause of extinction seen towards the Nebula. The wealth of spectroscopic data available for the Veil makes it an ideal case-study of physical processes in the Interstellar Medium (ISM). Radio observations (continuum and 21cm absorption) allow us to map the amount of extinction in the Veil, along with a map of the line-of-sight magnetic field. UV and optical absorption data of atoms and H₂ allow us to determine abundances of elements in multiple stages of ionization, density, and temperature. In this talk, I will discuss the observations which make the Veil unique. I will also show how, by combining the observational with theoretical calculations using the spectral synthesis code Cloudy, we have determined the distance of the Veil from the ionizing stars of the Orion Nebula, the balance between magnetic, thermal, and gravitational energy in the Veil, the geometry of the Veil, abundances, and many other physical properties in the Veil. Overall, a picture develops of a region within two parsecs of the ionizing stars of Orion, a region dominated by magnetic pressure, and a region where H₂ molecules are in highly excited rotational/vibrational states.