

Abstract for an Invited Paper
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Melting curve of molecular hydrogen¹

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More than 70 years ago Wigner and Huntington predicted that at sufficiently high pressures hydrogen will become an atomic metallic solid. Metallic hydrogen has not yet been observed at pressures exceeding 3 Mbar at low temperatures. Recent calculations predict a maximum in the melting line of hydrogen. Extrapolations to higher pressures suggest that metallic hydrogen may be a liquid at $T=0$ K with interesting quantum properties. Confining hydrogen at elevated temperatures is challenging as hydrogen tends to diffuse out of the cell. Combination of static pressure techniques with dynamic temperature variations can be used to suppress the diffusion of the sample out of the pressure cell. We have extended the melting line of hydrogen and observed the predicted peak and shall discuss this, the unusual properties of hydrogen, and its various phases.

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