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Phys. Rev. Lett. 100, 257001 (2008) [4 pages]

Ab Initio Description of High-Temperature Superconductivity in Dense Molecular Hydrogen

Abstract

References

Citing Articles (23)

Download: [PDF](#) (417 kB) Export: [BibTeX](#) or [EndNote](#) (RIS)P. Cudazzo¹, G. Profeta¹, A. Sanna^{2,3}, A. Floris³, A. Continenza¹, S. Massidda², and E. K. U. Gross³¹CNISM - Dipartimento di Fisica, Università degli Studi dell'Aquila, Via Vetoio 10, I-67010 Coppito (L'Aquila) Italy²SLACS-INFN/CNR—Dipartimento di Fisica, Università degli Studi di Cagliari, I-09124 Monserrato (CA), Italy³Institut für Theoretische Physik, Freie Universität Berlin, Arnimallee 14, D-14195 Berlin, GermanySee Also: [Publisher's Note](#)

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We present a first-principles study of the electron-phonon interaction and the prediction of the superconducting critical temperature in molecular metallic hydrogen. Our study is able to single out the features which drive the system towards superconductivity: mainly, a rich and complex Fermi surface and strongly coupled phonon modes driving the intra- or intermolecular charge transfer. We demonstrate that in this simple system, a very high superconducting critical temperature can be reached via electron-phonon and Coulomb electron-electron interactions.

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See Also

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