
TCSUH Special Seminar

Conventional Superconductivity at 203 K at High Pressures

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University of Houston Science Center
Room 102
12:00 noon – 1:00 p.m.

ABSTRACT:

The Bardeen–Cooper–Schrieffer (BCS) theory gives a guide for achieving high critical temperature of superconductivity (T_c): it should be a favorable combination of high frequency phonons, strong coupling between electrons and phonons, and high density of states, and puts no apparent bounds on T_c . These conditions can be fulfilled for metallic hydrogen and covalent hydrogen dominant compounds. We found that sulfur hydride transforms at pressure ~ 90 GPa to metal and superconductor with T_c of 203 K at pressure 140 GPa (A. P. Drozdov, M. I. Eremets, I. A. Troyan ([arXiv:1412.0460](https://arxiv.org/abs/1412.0460))). We proved occurrence of superconductivity by the sharp drop of the resistivity to zero; the decrease of T_c with magnetic field; the pronounced isotope shift of T_c in D_2S which evidences of a major role of phonons in the superconductivity; and the magnetic susceptibility measurements with an onset $T_c=203$ K.

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See: <http://www.mpic.de/en/research/further-groups/eremets-group.html>

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