



THE CHINESE UNIVERSITY OF HONG KONG

Department of Physics

COLLOQUIUM

Superconductivity Under Pressure

by

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Date: February 20, 2009 (Friday)

Time: 4:00 - 5:00 p.m.

Place: L2, Science Centre, CUHK

(Light refreshments will be served 20 minutes prior to the colloquium.)

ALL INTERESTED ARE WELCOME

Abstract

Using diamond-anvil cells, pressure is emerging as a new physical dimension in superconductivity research. As a clean and effective variable, pressure affects significantly superconducting properties of substance of element, alloy, or compound already known to be superconducting. Applying pressure has transformed many substances that are not superconducting at atmosphere pressure into superconducting modifications, including 22 element solids which brings the total number of element-solid superconductors to 52. Information on the pressure effect on superconductivity has been proven to be necessary for engineering a superconducting material to have a much higher transition temperature than at ambient condition through chemical means such as elemental substitution or film epitaxial growth. The high-pressure studies also throw light on the theory of superconductivity. Currently, copper-oxide high-temperature superconductors remain the superconducting materials having highest transition temperatures both at ambient condition and under pressure. Pressure-driven remarkable enhancement of superconductivity in multilayer cuprates is expected to exemplify the process of bringing and/or designing compressed materials with much higher transition temperatures through chemical and paths to ambient condition applications. Dense hydrogen-rich materials are being examined as potential high-temperature or room temperature superconductors. High-pressure studies therefore contribute to superconductivity in diverse ways.

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