量子科學與工程研究中心
Center for Quantum Science and Engineering (CQSE)

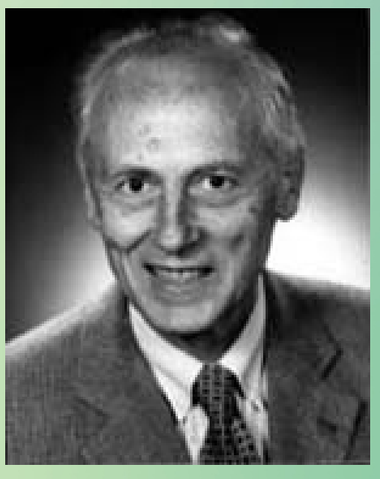
OPENING CEREMONY
& NTU Forum in Condensed Matter Science

時間：97年11月26日(三)
地點：台大物理系新館204國際會議廳

09:30~10:00 Reception

10:00~10:30 Opening Ceremony

10:30~11:15 Plenary Talk I



"Superconductivity without Phonons" Prof. Peter Fulde

Asia Pacific Center for Theoretical Physics, Pohang, Korea
Max-Planck-Institut fur Physik komplexer Systeme, Dresden, Germany

In the BCS theory the glue for Cooper pairing is provided by phonons. But there is no reason why other bosonic low-energy excitations could not replace phonons. It has been predicted some time ago that in particular crystalline electric field (CEF) excitations of the incomplete f shell can lead to Cooper pair formation. There is by now strong evidence that in the filled skutterudite La1-xPrxOs4Sb12 these excitations play together with phonons an important role. Moreover, in UPd2Al3 the superconducting Tc as well as the strong anisotropic mass enhancement of the quasiparticles can be explained by CEF excitations.

11:15~12:00 Plenary Talk II

"Spin Current, Charge Current, Heat Current and Spin-Electronics" Prof. Sadamichi Maekawa

Institute for Materials Research Tohoku University, Sendai, Japan
CREST, Japan Science and Technology Agency, Tokyo, Japan

In the Seebeck effect, the electric voltage is generated in a conductor placed in a temperature gradient. The efficiency of the effect is given by the density and the scattering of the conduction electrons in usual metals and semiconductors. Recently, the transition metal oxides have attracted much attention as thermo-electric materials. Since the Seebeck effect is due to the entropy carried by the electric current, the spin and orbital degrees of freedom of conducting electrons in the oxides may enhance the Seebeck effect [1]. In the first part of this presentation, the enhanced Seebeck effect is discussed in the transition metal oxides. In the second part, the spin-Seebeck effect is proposed [2], where the spin voltage, i.e., spin accumulation, is generated in a ferromagnetic metal placed in a temperature gradient. Then by utilizing the spin-detection method based on the spin-Hall effect, the spin voltage is converted to the electric voltage. The Spin-Seebeck effect is induced by a pure spin current, a flow of electron spin without electric charge current, and provides a variety of spin-electronics applications.

12:00~14:00 Lunch

NTU Forum in Condensed Matter Science 地點：台大物理系新館 R104

14:00~14:20 "How to become an excellent center" Prof. Peter Fulde

14:20~14:50 Criteria For the excellence of Theoretical Center
Moderator : Prof. Chu, Shih-I

14:50~15:20 Panel Discussion

15:20~15:50 Break

15:50~16:10 "New trend of condensed matter science in 21th Century"
Prof. Sadamichi Maekawa

16:10~16:40 New research directions of Condensed Matter theory
Moderator : Prof. Chang, Ching-Ray

16:40~17:10 Panel Discussion

Panelist: Prof. Peter Fulde, Prof. Sadamichi Maekawa, Prof. Xin-Cheng Xie, Prof. George Wei-Shu Hou, Prof. Chung-Yu Mou, Prof. Yan-Ten Lu, Prof. Yia-Chung Chang, Prof.Ting-Kuo Lee, Prof.Ching-Ming Wei

主辦單位：量子科學與工程研究中心(CQSE)
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