北京大学量子材料科学中心
International Center for Quantum Materials, PKU

中心系列讲座 ICQM Weekly Seminar Series

"Dynamic Jahn-Teller Effect in the NV- Center in Diamond"

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Time: 4:00pm, June. 29, 2011 (Wednesday)
时间：2011年6月29日 （周三）下午4:00
Venue: Room 607, Conference Room A , Science Building 5
地点：理科五号楼607会议室

Abstract

The negatively charged nitrogen-vacancy (NV-) centers in diamond, with their unique spin and optical properties, have emerged as a promising solid system for studying spin related phenomena. The local spin states of the NV- center can be accessed and manipulated optically at a single-site level, making it suitable for quantum information applications. Despite much research efforts, our understanding of the excited state structure of this system is still limited. Using a combination of first-principles calculations and vibronic interaction model analysis, we establish the presence of a dynamic Jahn-Teller (JT) effect in the E excited state with a barrier to tunneling splitting ratio of 0.29. The E excited state of the NV- center plays a central role in the optical initialization and readout of the spin states and in the use of the NV- center as a single photon source. Detailed knowledge of the excited state properties is of critical importance to exploit the full potential of the NV- center.

About the Speaker

Dr. Peihong Zhang obtained his PhD in condensed matter physics from Pennsylvania State University (2001). He received a post-doctoral fellow from the University of California at Berkeley .Now he works as an associate professor in University at Bualo, SUNY. His research interests are mainly Quasiparticle and optical excitations in solids and nanostructures, unconventional mag-netism in nonmagnetic semiconductors, electron-phonon renormalization and supercon-ductivity, screened Coulomb interaction of localized electrons in solids, complex oxides,hydrogen storage materials, and graphene/ferromagnetic metal interface..