

21COE物質階層融合科学セミナー  
物性コロキウム

日時：平成15年9月12日（金）15:30-17:00  
場所：理学部総合研究棟 745号室(大学院講義室 II)  
講師：**Prof. Arun Bansil** *Northeastern University*  
題目：**Electron correlation effects in novel materials:  
Recent studies of cuprates, manganites and 3D  
quantum dots**

**Abstract :**

Electron correlation effects are drawing an increasing attention in wide classes of novel materials. Our recent work on several systems of current interest is presented: (i) We show how the Fermi surface of NCCO evolves with electron doping as the Mott pseudogap collapses, in the light of ARPES experiments and related simulations (one-band Hubbard). We also discuss how the powerful selectivity properties of the ARPES matrix element can be exploited in the cuprates. (ii) On quantum dots, by invoking a simple model Hamiltonian, the interacting ground state is found to exhibit striking oscillations in spin polarization with dot radius. These oscillations induce characteristic signatures in the electron momentum density, suggesting novel routes for their observation. (iii) We discuss magnetic Compton scattering measurements on La-manganite and their implications for the  $t_{2g}/e_g$  occupancy in this CMR material.

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