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Interfacial Properties of Ultra-thin YBCO/LCMO Superlattices[1] BENJAMIN GRAY, JIAN LIU, E.J. MOON, M. KAREEV, D.J. MEYERS, Physics Department, University of Arkansas, I.C. TUNG, M.J. BEDZYK, Department of Materials Science and Engineering, Northwestern University, M. VEENENDAAL, J.W. FREELAND, Advanced Photon Source, Argonne National Laboratories, J. CHAKHALIAN, Physics Department, University of Arkansas — The rational design of complex oxide heterostructures enables the investigation of novel materials with antagonistic order parameters. Our previous work using resonant x-ray spectroscopies has provided insight into the role of orbital reconstruction and covalent bonding at the interface of such heterostructures. In this talk, we will further address the intriguing interfacial electronic and magnetic properties and possible coupling between layers in superlattices composed of alternating superconductive $YBa_2Cu_3O_7$ and ferromagnetic $La_{2/3}Ca_{1/3}MnO_3$ layers upon approaching the ultra-thin limit, where a superconductor to insulator transition with increasing thickness N is observed in [YBCO (1 u.c)/LCMO (N u.c.)] superlattices.

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Benjamin Gray
Physics Department, University of Arkansas

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