

TcSUH Bi-Weekly Seminar

Texas Center for Superconductivity at the University of Houston



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The Nature of Highly Epitaxial Double Perovskite $\text{LaBaCo}_2\text{O}_{5.5+\delta}$ Thin Films

Friday, September 9, 2011

Room 102, University of Houston Science Center

12:00 noon - 1:00 p.m.

Abstract

Recently, Perovskite Cobaltites have fascinated scientists and engineers' attention due to their interesting and important magnetic and electronic transport properties for energy harvest and chemical sensor development. Among them, the double perovskite $\text{LaBaCo}_2\text{O}_{5.5+\delta}$ shows very ultrafast oxygen transport properties and unique magnetotransport properties probably resulted from the various oxidation states ($\text{Co}^{2+}/\text{Co}^{3+}/\text{Co}^{4+}$) of cobalt, different spin state configurations, and the A-site cations' ordering structures of La^{3+} and Ba^{2+} . We have successfully fabricated highly epitaxial LBCO thin films with controllable film orientations and discovered various interesting physical phenomena. For instance, a giant resistance switch behavior was found during the reduction and re-oxidation process with a reproducible resistance response over 99% at temperature range of 400 ~ 780°C; an ultra large MR effect value of about 44% for the film of 82nm was achieved at 60 K; etc. Details will be discussed in the talk.

Bio

Dr. C. L. Chen is currently a professor of physics at the Department of Physics and Astronomy at the University of Texas at San Antonio and a joint professor at the Texas Center for Superconductivity at the University of Houston (TcSUH). He received his Ph. D. degree in solid state science (Materials) from the Pennsylvania State University in 1994. He was a Director's Funded Post-doctoral Fellow at the Los Alamos National Laboratory before he became a faculty member at TcSUH in May 1996. His research interests have spanned over the areas of multifunctional oxide thin film epitaxy and nanostructure fabrication, surface and interface physics and chemistry, and modeling developments. He has authored and/or coauthored more than 110 refereed papers that have appeared in Nature, Physical Review Letters, Applied Physics Letters, Nanoletters, and others, and has delivered more than 150 plenary lectures/invited talks at various international/national conferences (MRS, ACerS, IMRUS, etc.), universities, and research institutes. He has served as a member of several international advisory boards at various international conferences, and as chair and/or co-chair in various international and national symposiums such as the American Ceramics Society, Materials Science and Engineering, and others. His research has been supported by NSF-NIRT and CMS programs, Department of Energy, Army Research Office, NIH, the Texas Advanced Research Program, the State of Texas through the TcSUH, and various government labs.

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