MAR15-2014-020811

Abstract for an Invited Paper
for the MAR15 Meeting of
the American Physical Society

**Thermal and photoconductivity at the $La_{1-x}Sr_xCrO_3/SrTiO_3(001)$ interface**

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We have investigated the electronic and photophysical properties of interfaces between $La_{1-x}Sr_xCrO_3$ and $SrTiO_3(001)$ as prepared by molecular beam epitaxy. $LaCrO_3$ is a III-III antiferromagnetic insulator whereas $SrCrO_3$ is a II-IV metallic oxide. Substituting $Sr^{2+}$ for $La^{3+}$ in $LaCrO_3$ effectively dopes holes into the top of valence band, reducing the band gap and the resistivity, and generating a *p*-type oxide semiconductor In contrast, $SrTiO_3$ is a wide-gap II-IV semiconductor that is readily made *n*-type by La doping. Therefore, the $La_{1-x}Sr_xCrO_3/SrTiO_3(001)$ system has much potential for interesting interface physics with regard to studying intrinsic conductivity via electronic reconstruction and electron-hole pair separation upon light irradiation. However, there are inherent physical and chemical complexities at these interfaces and within the bulk of the $La_{1-x}Sr_xCrO_3$ films which can have profound effects on the associated functional properties. In this talk, we present some of our most recent results from this ongoing investigation.

In collaboration with Kelvin Zhang, Du Yingge, Sushko Peter, Bowden Mark, Shutthanandan V, Pacific Northwest National Laboratory; and Shawn Sallis, Louis Piper, Binghamton University.