MAR17-2016-020371

Abstract for an Invited Paper
for the MAR17 Meeting of
the American Physical Society

Structure, Defects and Electronic Transport in High-Mobility $BaSnO_3$ Films and Heterostructures[1]

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Wide bandgap perovskite oxides with high room-temperature conductivities that are structurally compatible with other perovskite materials are of significant current interest as transparent conductors and as active components in high performance power electronics. Such materials must also possess high room-temperature mobility to minimize power consumption and to enable high frequency applications. In this talk, I will focus on the detailed electronic transport study of La-doped $BaSnO_3$ films and heterostructures grown using the hybrid molecular beam epitaxy technique. We will discuss the mobility-limiting scattering mechanisms by calculating temperature-dependent mobility, and Seebeck coefficient using the Boltzmann transport framework and *ab initio* calculations. Finally, we will provide pathways to realize high mobility two-dimensional electron gases in $BaSnO_3$ via bandgap engineering approaches.

[1]Supported by the NSF and AFOSR YIP