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**Mapping the Ferromagnetic, Charge Ordered, and Antiferromagnetic phases in $La_{1-x-y}Pr_yCa_xMnO_3$** MARK H. BURKHARDT, Stanford University and SLAC National Accelerator Laboratory, M. A. HOSSAIN, S. SARKAR, A. SCHERZ, J. STÖHR, SLAC National Accelerator Laboratory, Y.-D. CHUANG, A. G. CRUZ GONZALEZ, A. DORAN, A. SCHOLL, A. T. YOUNG, Advanced Light Source, Lawrence Berkeley National Laboratory, Y. J. CHOI, S.-W. CHEONG, Rutgers Center for Emergent Materials and Department of Physics & Astronomy — Manganite compounds in the $La_{1-x-y}Pr_yCa_xMnO_3$ series are known for exhibiting extremely high colossal magnetoresistance (CMR). We combined the x-ray photoemission electron microscopy (PEEM) and resonant elastic soft x-ray scattering (REXS) techniques to study the interplay between the ferromagnetic and charge-ordered/antiferromagnetic phases, respectively, in $La_{1-x-y}Pr_yCa_xMnO_3$. In both measurements, we find a strong temperature dependence of the magnetic domains around the transition temperature. We will show images of magnetic domains, which provide clear evidence for phase separation on the submicron scale. We will also use these images, paired with the information on the charge-ordered/antiferromagnetic phase from the REXS data, to explain the temperature dependence of the CMR effect in this material. The research, SSRL, and the ALS are supported by U.S. Department of Energy, Office of Basic Energy Science.

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