Poster Presentation

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Investigation of orbital disorder in Ca-doped LaMNO3

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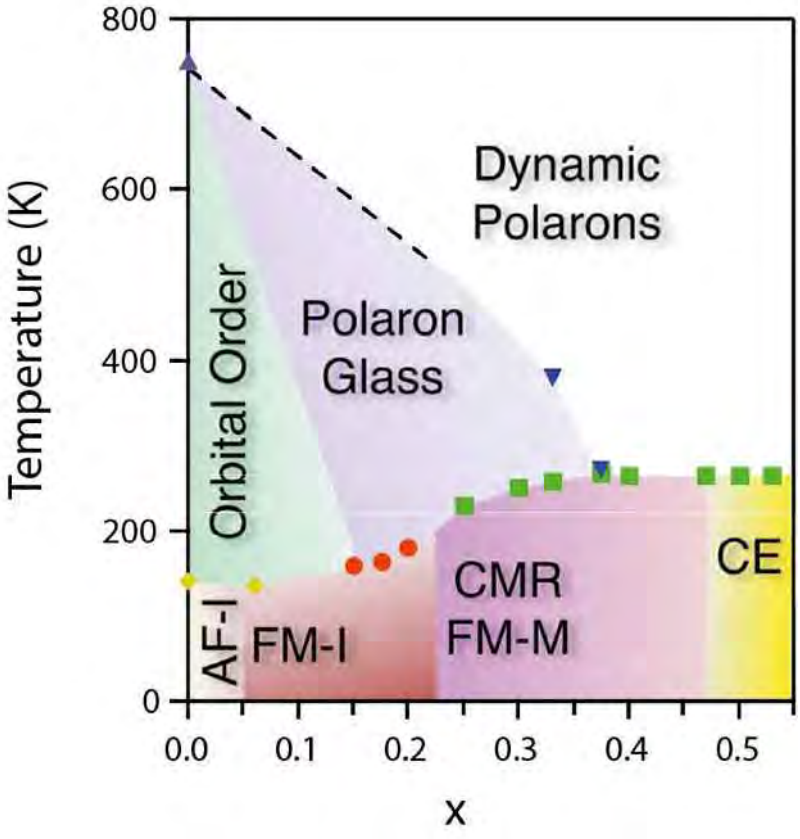
Studies of materials that exhibit colossal magnetoresistance (CMR) have been well documented over the past decade [1]. La1-xCaxMnO3 is one such CMR material that has attracted significant attention as it is relatively cheap and straightforward to synthesize. CMR materials have potential use among the next generation of magnetic memory devices, magnetic-field sensors, and transitors. For that to be possible a clear understanding has to be determined for the origin of the CMR phenomenon. Recent studies of CMR manganites have shown that a 'polaron glass' phase precedes CMR behaviour at high temperatures (figure 1) [2]. This glasslike state sits midway between the high-temperature polaron liquid and the fully orbital-ordered solid with polarons. The polarons are localized charge density fluctuations associated with lattice deformation which gives rise to static, short-range correlations. At low temperature these polaron correlations are thought to evolve into the nanoscale polarons responsible for CMR itself. This poster describes our reasoning for the anticipated connection between the orbital disorder and CMR in La1-xCaxMnO3 revealed via reverse Monte Carlo modelling of X-ray and neutron total scattering data.

[1] *C Felser et al., Angew. Chem. Int. Ed. 46,668-699 (2007),* ***[2]*** *J W Lynn et al., Phys Rev B 76, 014437 (2007)*



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