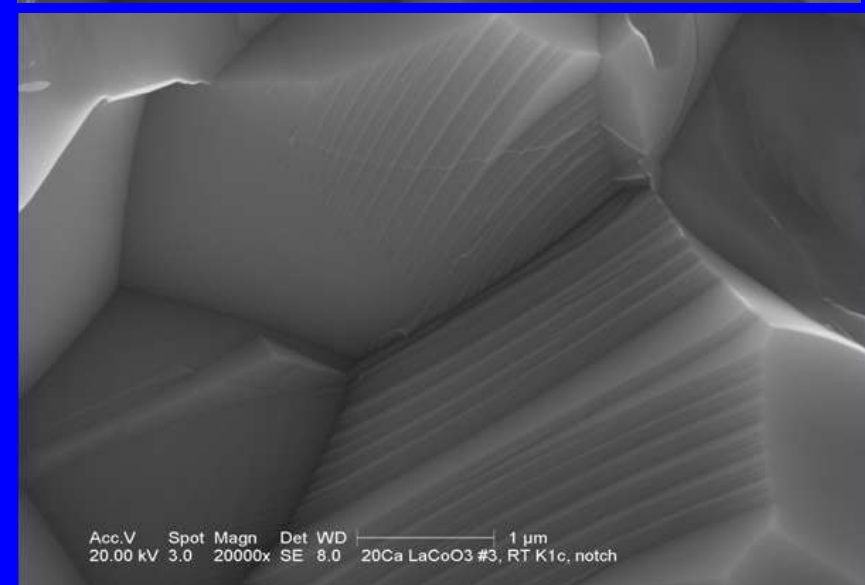
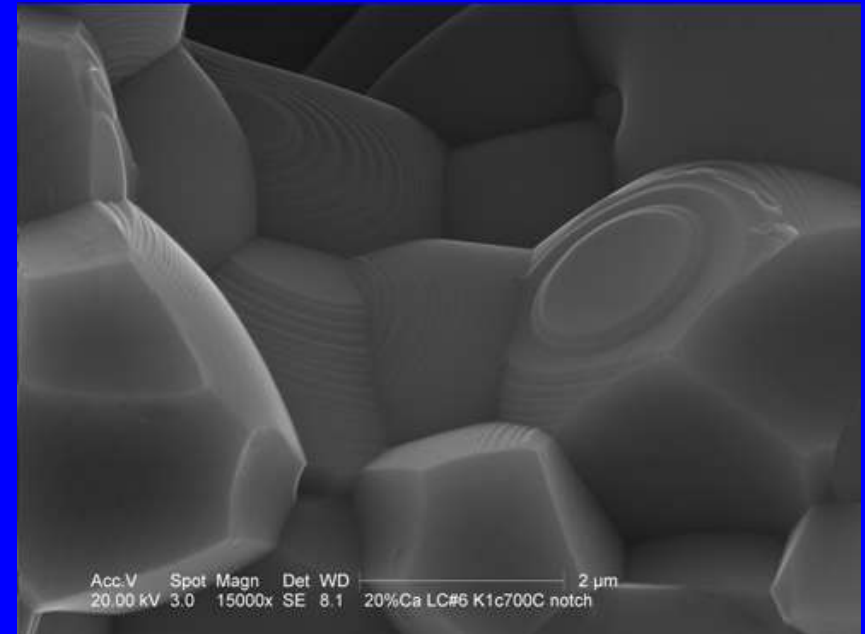


Ferroelasticity and Hysteresis in MIEC perovskites

Prof. Nina Orlovskaya (PI), Drexel University, DMR-0201770

We have studied ferroelastic behavior of LaCoO_3 based polycrystalline perovskites. While it was known that perovskites have a layered structure, it was a surprise to see the layered patterns on the fracture surfaces of the cobaltites. The existence of such layers could be a strong proof that these materials are able to deform by kinking that involves a dislocation movement. While the major deformation mechanisms responsible for the ferroic behavior are domain switching or twinning/detwinning processes, they can not explain the hysteretic behavior of the cobaltites alone. Therefore, other mechanisms, such as dislocation movement or grain rotation should be involved in the inelastic deformation. These results can have an important implication for the reliability of energy generating devices including SOFCs.



Drexel Students Involved in the Ceramics Research

Prof. Nina Orlovskaya (PI), Drexel University, DMR-0201770

Three undergraduate students, 2 BS/MS students and 2 PhD students have been involved in this work. Their earlier involvement in the project has motivated two Drexel undergraduate students to pursue their BS/MS degree on SOFCs related topics. One of the BS/MS students, David Steinmetz, received a prestigious 6 month international fellowship to work at EMPA, Dübendorf, Switzerland. He is currently working there on the characterization of ceramics and will return back to Drexel when classes starts in September. One of the PhD students, Siddhartha Pathak, is a recipient of a prestigious SURF fellowship which allows him to spend 10 summer weeks at Oak Ridge National Laboratory (ORNL). In ORNL, he is working on the mechanical testing and characterization of mixed ionic electronic conducting perovskites.

