

# Grain Boundary Transport in Electroceramics

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Charge transport across and along grain boundaries can have profound implications on the macroscopic behavior of electrolyte and electrode materials used in solid state fuel cells, batteries and other energy technologies. A fundamental understanding of grain boundary behavior requires deconvolution of the contributions of individual grain boundaries to the globally measured ensemble average. The methods have been developed to contact individual bicrystals that will enable such characterization in the prototype material  $\text{CeO}_2$ . In parallel electron holography has been initiated as a means for measuring the electric field potential in the related material,  $\text{Sm}_{0.15}\text{Ce}_{0.85}\text{O}_{1.925}$ . These measurements will directly reveal the physical origins of enhanced/diminished grain boundary transport.

