



The Neutron Scattering Society of America <http://www.neutronsattering.org>

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Dr. Guangyong Xu

Dr. Guangyong Xu

Brookhaven National Laboratory

is the recipient of the

2012 Science Prize

of the Neutron Scattering Society of America (NSSA) with the citation

“For his work on relaxor ferroelectrics that have provided new insights into the role of polar nano-regions in determining the extreme electromechanical properties of these materials”

The Neutron Scattering Society of America (NSSA) established the Science Prize to recognize a *major scientific accomplishment or important scientific contribution within the last 5 years* using neutron scattering techniques. Nominees must be within 12 years of receiving their PhD degree. Preference shall be given to applicants whose work was carried out predominantly in North America.

The nominations were reviewed by a committee of experts in the scientific areas to which neutron scattering contributes, and the NSSA is pleased to announce that the 2012 recipient of the Science Prize is **Dr. Guangyong Xu** of Brookhaven National Laboratory. The prize and \$2500 honorarium will be awarded at the 2012 ACNS in Washington, DC, June 24-28, 2012 (<http://www.mrs.org/acns-2012/>).

Over the past five years Dr. Guangyong Xu has achieved profound experimental insights in relaxor ferroelectrics through neutron and synchrotron x-ray diffraction. By combining these techniques, he discovered that single crystalline relaxors such as $\text{PbZn}_{1/3}\text{Nb}_{2/3}\text{O}_3$ (PZN) and $\text{PbMg}_{1/3}\text{Nb}_{2/3}\text{O}_3$ (PMN) form a rhombohedral surface layer with a thickness up to 10 μm . Within the cubic bulk he obtained clear evidence through coherent diffuse scattering of polar nano-regions that respond by changing shape to an applied electric field. He also found through inelastic neutron scattering that the field dependent configuration of polar nano-regions strongly affects phonon propagation through the bulk.

Relaxor ferroelectrics are playing an increasingly important technological role –PZN with 4.5% PbTiO_3 for example displaying the largest known piezo-electric coefficient. Dr. Xu's work links these properties to unique field dependent atomic scale bulk and surface structure. His experiments have poised this field of research and development for a breakthrough in understanding and designing improved relaxor ferroelectrics.

Dr. Guangyong Xu received his PhD in 1999 from Johns Hopkins University and joined Brookhaven National Laboratory in 2002. Dr. Xu is currently a Tenured Physicist at Brookhaven National Laboratory.

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