The department of Physics is pleased to announce and congratulate Matthew Krogstad (PhD) and Logan Rice (MS) as recipients of NIU's Graduate Council's 2018-2019 most outstanding dissertation (MK) and most outstanding thesis (LR) awards in the STEM and Health Sciences category.

In his PhD dissertation "*Diffuse Scattering and Local Order in Lead-Based Relaxor Ferroelectrics*" *directed by Professor Omar Chmaissem, Matthew Krogstad* discusses complex diffuse scattering studies of the unusual high performance of lead-based relaxor ferroelectrics using advanced neutron and x-ray scattering techniques. His dissertation work was performed in collaboration with Argonne scientists Daniel Phelan, Ray Osborn and Stephan Rosenkranz in addition to a significant number of collaborators at Cornell University (NY), the National Institute of Standards and Technology (MD) and the Spallation Neutron Source at Oak Ridge National Laboratory (TN). Matthew's work is truly revolutionary. Decades-long questions and problems are now finding answers and solutions by studying full reciprocal space data. Matthew's PhD work proved that previously ignored (because of their hard detection and structural complexity) short-range local atomic order is more important for the relaxor ferroelectric properties than their long-range order that form the crystalline structure. This work was only feasible by carefully studying subtle data sets that are barely higher in intensity than the background. Matthew's results were published in the prestigious journal Nature Materials (The relation of local order to material properties in relaxor ferroelectrics by Krogstad *et al.* Nature Materials 17, 718-724 (2018)). Matthew enjoys continued success with many more publications including a recent Nature Materials letter (Reciprocal space imaging of ionic correlations in intercalation compounds by Krogstad *et al.* 2019)". As a student, Matthew's work earned two Outstanding Student Presentation Awards at the international Ferroelectrics workshop 2017 in Williamsburg, VA (January 2017) and at the American Neutron Scattering Society's bi-annual meeting in Long Beach, CA (July 2017).

In his thesis manuscript *"Toward a DUNE Photon Detection System" directed by Professor Vishnu Zutshi, Logan Rice* discussed key contributions he made to photo-sensor characterization and testing related to photon detector system R&D for the Deep Underground Neutrino Experiment (DUNE). DUNE, a global experiment, to be hosted jointly at Fermilab, IL and Sanford Underground Research Facility, SD will be able to study neutrinos, which are pivotal to understanding physics beyond the Standard Model, with unprecedented precision to address key issues in not only neutrino physics but also particle-astrophysics. Logan's work was an excellent contribution towards understanding the behavior and operation of photosensors immersed in cryogenic environments (LAr). This work informed the quality control and characterization procedures for photosensors installed in the protoDUNE detector – a 720-ton LAr Time Projection Chamber currently taking data at CERN. In parallel, he embarked upon simulation studies to better understand the performance requirements of such a photon detector system for a flux of low energy neutrinos such as from a Supernova explosion. It should be mentioned that Logan's results and studies have been scrutinized by the DUNE collaboration and numerous review committees and were a key element of the detector's Conceptual Design Report for the photon detection system. Building on his Master's thesis work, Logan is currently pursuing a Ph.D. in neutrino physics at the University of Pittsburgh.