## An overview of the neutron phase imaging collaboration between NIST and KAERI/PNU

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Recently, it has been shown that a shearing-type interferometer, which uses precision silicon gratings, allows the imaging of the gradient of neutron phase shift through an object and retrieval of the phase by simple onedimensional integration of the gradient. To fully explore this new technique for potential future cold neutron imaging stations at the National Institute of Standards and Technology and the Korea Atomic Energy Research Institute, we have developed two prototype systems: one at a monochromatic cold neutron beamline in the NCNR neutron guide hall and the other at a polychromatic thermal neutron beam line at HANARO, KAERI. Initially, we designed and fabricated the silicon gratings using evaporation or sputtering of Gd for source gratings and analyzer gratings, but the fabrication has become much easier and more flexible using the Gd-power filling method. As a result, a variety of neutron grating designs with different focuses, such as resolution, sensitivity, and autocorrelation length range, have been designed and tested at the cold neutron imaging facility built recently at NIST. In addition to the system hardware development, we will present several interesting material applications from this development and novel data processing techniques using machine learning. Finally, we will introduce several x-ray grating interferometer projects at Pusan National University for complementary use with neutrons.

Thursday, April 27, 2023 10:45 AM (UTC-05:00) Eastern Time (US & Canada) | Hybrid format Attend in person (room K04B, NCNR) if you have access to the NIST campus, or remotely using the link below.

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