

Heinz Nakotte

Major Research Projects

Project 1: *Negative Thermal Expansion Materials*: a systematic investigation of negative thermal expansion in Prussian Blue analogs. This research bridges fundamental and applied physics in collaboration with other researchers at NMSU and Oak Ridge National Laboratory.

Project 2: *Magnetism in Uranium Intermetallics*: the study of magnetic uranium compounds using high pressures, chemical substitution, hydrogenation and high magnetic fields in conjunction with neutron diffraction and bulk techniques. This research concerns the fundamental physics of actinide magnetism in collaboration with Charles University, Prague.

Project 3: *Structural Properties of Nanoparticles*: the determination of the local structure of nanosized particles and thin films. This work is done in collaboration with researchers at NMSU and Oak Ridge National Laboratory.

Project 4: *Neutron Radiography Studies of Materials*: real-space imaging of materials using resonant neutron radiography techniques. This work is done in collaboration with Los Alamos National Laboratory.

Research, Instrumentation and other Grants or Contracts

Currently Funded Research Grants or Subcontracts: None.

Pending Research Grants or Subcontracts:

"Center for Chemical Innovation (CCI) - Phase I: NSF Center for Sustainable Energy Technologies," National Science Foundation, \$1,800,000.00, co-PI, Description: White paper submitted to NSF in August 2018

"HBCU/MI - DoD Instrumentation Grant: Acquisition of a 9-Tesla Cryogen-Free Physical Property Measurement System for Materials Research at New Mexico State University," US Department of Defense, \$405,000.00, co-PI, Description: Proposal was submitted in August 2018

"Research Experience for Teachers (RET)", National Science Foundation, \$600,000, co-PI, Description: Proposal submitted to NSF in September 2018

Research Personnel

Grad students: Md Minuddin; *the lack of current research funding limits Nakotte's ability to attract 'new' students to his research group*

Main Collaborating Institutions

Oak Ridge National Laboratory (ORNL); Los Alamos National Laboratory (LANL); Charles University, Prague, The Czech Republic; Delft University, The Netherlands

Recent Publications

S. Mašková, A. V. Andreev, Y. Skourski, S. Yasin, D. I. Gorbunov, S. Zherlitsyn, H. Nakotte, K. Kothapalli, F. Nasreen, C. Cupp, H. B. Cao, A. Kolomiets, and L. Havela (2019) U₂Ni₂Sn and the origin of magnetic anisotropy in uranium compounds, *Physical Review B* **99**, 064415.

Nakotte, H., Silkwood, C., Page, K., Wang, H.-W., Olds, D., Kiefer, B., Manna, S., Karpov, D., Fohntung, E. B., Fullerton, E. E. (2017). Pair Distribution Function Analysis applied to Decahedral Gold Nanoparticles. *Physics Scripta. Elsevier*, 92(11), 114002.

Maskova, S., Andreev, A. V., Skouski, Y., Kothapalli, K., Wosnitza, J., Nakotte, H., Kolomiets, A., Havela, L. U₂Ni₂Sn and origin of magnetic anisotropy in uranium compounds. *Physical Review B*, in preparation
Losko, A. S., Vogel, S. C., Tremsin, A. S., McClellan, K. J., Bourke, M. A., Byler, D. D., Mocko, M., Hosemann, P., Nakotte, H. Imaging of Nuclear Fuel Rods using Time-Of-Flight Neutrons. *Nature Scientific Reports*, in preparation.

Service & Administrative Duties (selected list)

Interim Department Head (since May 2018)

Chair of the Time-of-Flight Subcommittee of ORNL's Science Review Committee