Section I

J. Subject Categories:
Neutron Scattering, X-ray Scattering, Magnetism, Phase Transitions

K. Description / Abstract

Small angle neutron scattering has been used to study ordering processes in phase-separating mixtures of solid $^3$He-$^4$He. Inelastic neutron scattering has been used to study excitations in low-dimensional quantum magnets.
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Abstract

This report summarizes the activities sponsored by the US DOE under award No. DE-FG05-96ER4555.

I. Research Activities

The research sponsored by this award utilized x-ray and neutron scattering techniques to investigate problems in condensed matter physics. The award supported two graduate research assistants (A.W. Garrett and J.P. Koster) enrolled at the University of Florida. The principal investigator, Dr. Stephen Nagler, is a former Professor of Physics at University of Florida. He is currently a senior research scientist and group leader at the Oak Ridge National Laboratory. The work supported included studies of phase separation in solid $^3$He-$^4$He mixtures. The bulk of the research involved inelastic neutron scattering studies of magnetic excitations in low dimensional magnetic materials.

The primary use of award money was to fund research assistantships and other expenses for research carried out by the graduate students Andrew Garrett and Jacobus (Sjaak) Koster. Some of the funds were used to procure isotopic (deuterated) chemicals for the preparation of single crystal samples for inelastic neutron scattering. This activity was carried out in collaboration with the groups of Professor D. Talham (Chemistry, University of Florida, sample preparation) and Professor M. Meisel (Physics, University of Florida, sample characterization).

As a result of research supported by this award, Andrew Garrett was awarded the Ph.D. Degree from the University of Florida in 1998. He is currently employed as a postdoctoral research fellow at the pulsed neutron laboratory, KEK, Japan. Sjaak Koster left the Ph.D. program before completion to pursue opportunities in the private sector. He is currently employed in a high technology company in silicon valley (San Jose, CA.)
II. Publications sponsored in whole or in part by this award:

A. Refereed Publications:

B. Contributed Abstracts of Conference Presentations:

C. Ph.D. Thesis:
IIII. Personnel
- S.E. Nagler, PI (not directly supported by award).
- A.W. Garrett, Graduate Research Assistant
- J.P. Koster, Graduate Research Assistant

IV. Travel
The award supported some travel by A.W. Garrett and J.P. Koster between the University of Florida and the Oak Ridge National Laboratory, as well as to scientific meetings in Tallahassee, FL (Physical Phenomena at High Magnetic Fields), Kansas City MO (APS March Meeting), and Toronto, Canada (International Conference on Neutron Scattering).