



*Advances in Fundamental Understanding of Structural Materials Behavior through International Collaborations on Research and Education in Neutron-Scattering Materials Science*

- Neutrons are an essential tool for researchers studying ways of improving materials that are used in transportation systems, agricultural equipment, electronics, and infrastructures.
- International collaborations are essential to restore U.S. leadership in neutron science.
- The NSF IMI Program (ANSWER) at the University of Tennessee develops an international network of researchers in the field of “neutron-scattering materials research” and provides U.S. students with international research experiences.
- The following advances are made through international cooperation:
  - In-situ studies of mechanical behavior
  - Real-time measurements of internal stresses
  - In-situ studies of atomic structures and microstructures
  - Theoretical modeling and lifetime prediction



From left to right: Ms. E. Garlea, Mr. J. Wall, and Mr. T. Saleh, Ph.D. students of University of Tennessee, at neutron facilities throughout the world, including the ISIS facility in UK.



## International Materials Institutes (IMI)

### Advanced Neutron Scattering NetWork for Education and Research (ANSWER)

P. K. Liaw, H. Choo, and R. A. Buchanan  
The University of Tennessee, DMR-0231320



A tour of the Spallation Neutron Source (SNS) construction site at the Oak Ridge National Laboratory after the 1<sup>st</sup> ANSWER Workshop



Dr. M. Daymond (ISIS, UK) giving a lecture on neutron diffraction to U.S. graduate students at the ACNS tutorial

### International Workshops and Conferences

- 1<sup>st</sup> ANSWER workshop was held at the University of Tennessee, which was attended by more than 100 researchers from 6 different countries.
  - International forum for discussions on science and education issues related to the neutron-scattering materials research and international exchange programs.
- ANSWER is organizing an international symposium on “Neutron-Diffraction Characterization of Mechanical Behavior” at the 2005 TMS Annual Meeting, which will be attended by leading neutron scientists from 13 different countries.

### International Collaborations on Education

- ANSWER organized a tutorial on “Introduction to Neutron-Diffraction Studies of Residual Stresses and Mechanical Behavior” at the American Conference on Neutron Scattering (ACNS), College Park, MD, June 2004.
- ANSWER supported US students attending the “2004 Neutron Summer School” at the Chalk River Laboratory in Canada.