NEUWAVE-4 Workshop on Neutron Wavelength Dependent Imaging

October 2-5, 2011
Gatlinburg, Tennessee, USA

Chair: Dr. Kenneth W. Tobin, Director, Measurement Science and Systems Engineering Division

Program Committee: Hassina Bilheux, ORNL; Jack Brenizer, Penn State; Thomas Buecherl, TU Munich; Nikolay Kardilov, Helmholtz Center; Yoshiaki Kiyanagi, Hokkaido University; Winfried Kockelmann, ISIS; Eberhard Lehmann, PSI; Burkhard Schillinger, TU Munich; Axel Steuwer, ESS; Wolfgang Treimer, Helmholtz Center.

Sunday, October 2, 2011

Hike in the Great Smokey Mountains National Park

Alum Cave Bluff Trail, 4.6 mile (7.4 km) round trip
1:00PM – Meet in Park Vista Hotel Lobby

Monday, October 3, 2011

Continental Breakfast / Registration 8:00-9:00AM (Exhibit Hall)

Welcome and Opening Remarks 9:00AM
Ken Herwig

MORNING SESSION – Mountain View "B"

Beam line design and activity at existing facilities – *Chair: Eberhard Lehmann*

9:30-10:00 AM: Current Status of VENUS at SNS – Ken Tobin

10:00-10:30 AM: Current Status of the Imaging and Diffraction Facility IMAT at ISIS – Winfried Kockelmann

10:30-10:45 BREAK

10:45 – 11:15AM: Developments of Energy-Resolved Neutron Imaging Techniques using Pulsed Neutrons at J-PARC – T. Shinohara

11:15 – 11:45AM: Recent developments at the CONRAD instrument at the Helmholtz Centre Berlin – I. Manke

11:45 – 1:30PM LUNCH On your own

AFTERNOON SESSION- Mountain View "B"

Beam line design and activity at existing facilities – *Chair: Burkhard Schillinger*

1:30 – 2:00PM: Neutron Imaging Measurements at the CGID Development Beamline: Challenges and Accomplishments – Hassina Bilheux

2:00-2:30PM: – A New Monochromator Device for Energy Selective Imaging – Steven Peetermans

2:30-3:00PM: – Prospect of Neutron Imaging at ESS – Markus Strobl

3:00-3:15PM – BREAK

Advanced Techniques (Polarized, Phase and Fission Imaging) – *Chair: Nikolay Kardjilov*

3:15-3:45PM: – Investigations of Superconductors with Polarized Neutron Radiography – Wolfgang Treimer

3:45-4:15PM: – Edge Enhancement in Neutron Imaging-Experimental and Theoretical Considerations – Eberhard Lehmann

4:15-4:45PM: – Investigation of Dynamic Processes by Fission Neutron Radiography – Thomas Burchel

4:45-6:00PM: – Discussion Topic: Spallation Based Concepts – Lessons Learned, Ken Tobin and Hassina Bilheux

Tuesday, October 4, 2011

Continental Breakfast 8:00-9:00AM (Exhibit Hall)

Opening Remarks 8:45AM
Kenneth W. Tobin

MORNING SESSION-Mountain View "B"

Bragg Edge and Energy Selective Imaging – *Chair: Hassina Bilheux*

9:00-9:30AM: Energy-Dispersive Neutron Imaging Techniques – Nikolay Kardjilov

9:30-10:00AM: Recent Development of Rietveld-Type Analysis Technique for Bragg-Edge Transmission Imaging – Hirotaka Sato

10:00-10:15AM: BREAK

10:15-10:45AM: In-Situ Bragg Edge Imaging for Strain Mapping Under Multi-Axial Loading – Robin Woracek

10:45-11:15AM: Neutron Tomography and Diffraction of Intact, Commercial Lithium ion polymer batteries – Les Butler

11:15 – 11:45AM: Energy Selective Neutron Imaging for Material Science and Engineering and Exploiting Multi-Modality with X-Rays – Dayakar Penumadu

11:45 – 1:30PM LUNCH on your own

AFTERNOON SESSION-Mountain View "B"

Bragg Edge and Energy Selective Imaging – *Chair: Dayakar Penumadu*

1:30 – 2:00PM: The Energy Selector at the ICON Beamline, Characterization and Archaeometallurgical Applications – Steve Peetermans

2:00 – 2:30PM: Neutron Strain Tomography – Shu Yan Zhang

2:30 – 3:00PM: Various Applications of Pulsed Neutron TOF Imaging – Y. Kiyanagi

3:00-3:15PM BREAK

Detectors and Optics – *Chair: Philip Bingham*

3:15-3:45PM: High Resolution Energy Resolved Neutron Imaging, Transmission Diffraction and Resonance Absorption Imaging with MCP Detectors – Anton Tremsin

3:45-4:15PM: – Towards 1 Micrometer Spatial Resolution in Neutron Radiography – Daniel Hussey

4:15-4:45PM: – Current Development of Time Slice Imaging Devices in Hokkaido University – Takashi Kamiyama

4:45-5:15PM: – Towards solving the 10-micron Resolution Challenge: Aberration-free Image-Forming Neutron Optics – Boris Khaykovich

5:15-6:15PM: – Wrap-up Discussion

7:00-9:00PM: – Evening Social –

Aquarium Tour and Workshop Dinner-
Must have ticket

Wednesday, October 5, 2011

Continental Breakfast 8:00-9:00AM (Exhibit Hall)

Opening Remarks 8:45AM
Kenneth W. Tobin

MORNING SESSION –Mountain View "B"

Applications

Chair: Les Butler

9:00-9:30AM: Neutron Imaging of Fluids in Plant and Soil Systems – Misun Kang

9:30-10:00AM: Geothermal – Philip Bingham

10:00-10:30AM: High Resolution Neutron Imaging of Partially Saturated Sand and Engineering Applications – Felix Kim

10:30-10:45AM: BREAK

10:45-11:15AM: Improving the Detection of Water in an Operating Fuel Cell Using Cold Neutrons and Energy Selectivity – Jeff Bunn

11:15-11:45AM: The HFIR CGID First Applications: From Engineering to Plants – Hassina Bilheux

11:45-1:30PM: LUNCH On your own

AFTERNOON SCHEDULE

1:30-2:30PM: Travel to ORNL

2:30-5:30PM: SNS and HFIR TOURS AND DISCUSSION

5:30-6:30PM: Travel back to Gatlinburg

Sunday, October 2, 2011

Great Smoky Mountains National Park Hike
Alum Cave Bluff Trail

From the Sugarlands Visitor Center, drive 8.6 miles east on Newfound Gap Road. There you will find two parking areas, where a gravel path leads to The Grassy Patch and the beginning of a 2.3 mile hike to Alum Cave Bluff.

Summary: This moderately difficult hike is 4.6 miles round-trip or 5.1 miles on to LeConte Lodge. The round-trip to the cave bluff takes about 2 and 1/2 hours, but allow about 3 and 1/2 hours to LeConte Lodge. The Alum Cave Trail is the most popular and well-known route to Mount Le Conte.

Elevation: You gain 2600 feet on the way to 6400 feet.

Features: Arch Rock, 1993 summer storm damage, Inspiration Point, Alum Cave Bluff

Mother Nature's majesty and power are clearly demonstrated in this 4.6 mile (round-trip) hike. The views are great, particularly if you go on to LeConte Lodge and Cliff Tops, and the trail is not too difficult--even for children. To demonstrate, I recall an early visit (I was much younger and more fit) when I carried my sleeping daughter on my shoulder for the majority of the first half of the hike.

You'll begin this hike at the Grassy Patch just off the parking area. Shortly after entering the forest, you will parallel the Alum Cave Creek for approximately a mile and then follow Styx Branch, a main tributary of Alum Cave Creek. A few hundred yards beyond this point, you'll see the boulder and log remains of a 1993 flash flood and landslide on your left. A heavy thunderstorm dumped several inches of rain, with a force so great that huge boulders were exposed and tossed--its path is clear to the hiker and will remain so for years. At mile 1.5 you come to Arch Rock, where a set of stone stairs aids your passage through one of the few natural arches inside the park. At the 1.8 mile mark you will come upon Inspiration Point, affording the first panoramic view of the area. Thereafter, you'll pass through an area of low shrubs, and shortly thereafter arrive at Alum Cave Bluff (mile 2.3). Alum Cave is not what the name implies. It’s not a cave--rather it's a jutting ledge of black slate, forming out over the trail to give the impression of a cave. The name Alum Cave comes from the deposits of alum found along the "cave" walls.