FRM II
Forschungs-Neutronenquelle
Heinz Maier-Leibnitz

Technische Universität München

6th International Workshop on Sample Environment at Neutron Scattering Facilities

September 29th to October 1st 2010

Herrsching am Ammersee

www.frm2.tum.de

Technische Universität München
Forschungs-Neutronenquelle
Heinz Maier-Leibnitz (FRM II)
Lichtenbergstraße 1
85748 Garching, Germany

Preamble

State-of-the-art sample environment is a key element for successful experiments in neutron scattering. The workshop provides experts working in sample environment groups and scientists a platform for intensive discussions and interchange.

The needs of the neutron scattering community and the further development of cutting-edge sample environment will be discussed in view of a future improvement of the service quality provided at the neutron scattering facilities.

Since the first workshop held in Berlin at former HMI in 1998 and initiated by Michel Meißner, the sample environment community meets in an bi-annual rhythm. The workshop has well established as an inherent part of international interchange of experience.

We all like to thank Michel for his strong engagement, inspiring spirit and encouragement to develop cooperation among our facilities.

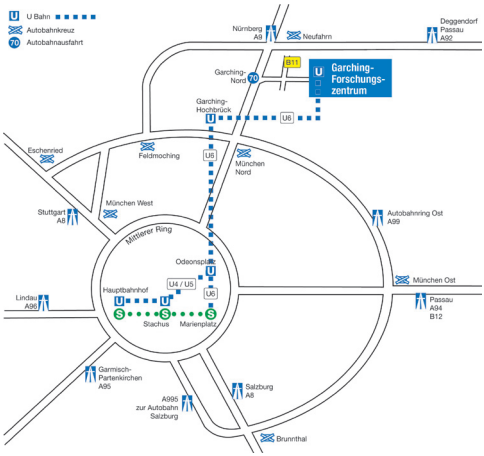
As an indication this spirit will be carried on by our community may be taken the attendance of our colleagues from Asia for the first time.

Welcome to FRM II and Herrsching to SE@NSF 2010

The organisers

General Information

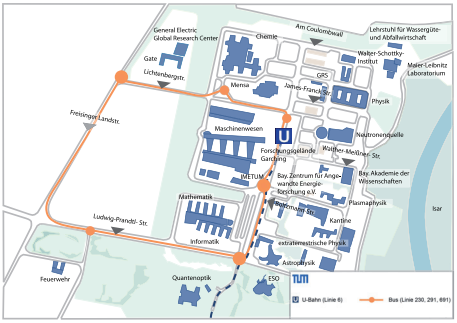
Public transport From Munich center
From Munich center you reach Garching via subway line U6 to Garching-Forschungszentrum. From there you have only 50m to walk to the entrance of the FRM II. The subway travel every 10 min in the main travel time, 20 min otherwise.



More info and time-tables on public transport:
www.mvv-muenchen.de

Munich Airport
The new Munich International airport is located some way outside Munich in the north-east.

To get to the FRM II at Garching
Best alternative is to take the S1 to Neufahrn, and then the bus 690 direction Garching-Forschungsgelände.



To get to the FRM II at Garching
Best alternative is to take the S1 to Neufahrn, and then the bus 690 direction Garching-Forschungsgelände.

Second alternative is S8 to Ismaning and from there bus 230 to Garching, TU

The transfer by taxi from Munich airport to FRM II takes about 15 min. and costs some 29,- €. Please indicate to the taxi driver, that you want to be driven to Forschungszentrum bei Garching" or "Technische Universität bei Garching". Once on the campus you indicate "Reaktorstation" or "Forschungsreaktor".

To get into central Munich
suburban train S8 or S1 (every 10 min.) The fare is 4 zones from the airport to town. Some airlines include the train fair in the ticket,please check this with your travel agent. See also public transport. Travel time ca. 40-50 min.

General Information

Arriving on Tuesday Sept. 28
In case attendees indicated on the registration form that they will arrive on Tuesday Sept. 28, will have accommodation booked at hotels located in Garching near the FRM II. Transport to the FRM II has to be done individually.

Workshop Hotel
Accommodation with full board is at the conference hotel „Haus der bayerischen Landwirtschaft“ (http://www.hdbl-herrsching.de). The hotel is situated in Herrsching at lake Ammersee, which is part of the Upper Bavaria’s Five-Lakes Region and about 40 km away from Munich.
Each participant has a single room with bathroom facilities.

Transportation to the workshop hotel and back
On Wednesday, Sept. 29, a shuttle bus will bring us to the workshop hotel. The coach will leave at 12:00 from the main entrance of the FRM II.

On Friday attendees will be free to take the shuttle bus back to Munich. A stop over at the FRM II or Munich airport can be arranged if convenient.

Remark
The workshop is scheduled during the Oktoberfest in Munich held from September 18th to October 4th. Your attendance at the workshop is an excellent opportunity to combine a visit of the famous beer festival.

Registration Hours
Wednesday, Sept. 29: The registration desk is located at the main entrance, opposite to the gate of the FRM II. Registration time from 8:00 to 8:45

Board and Lodging
Wednesday, Sep. 29, lunch (13:00 to 14:00) and dinner (19:00) will be served for registered workshop attendees at the conference hotel “Haus der Bayerischen Landwirtschaft” near Herrsching at Lake Ammersee.

Thursday, Sep. 30, breakfast (7:00 – 8:00) and lunch (12:30 – 13:30) will be served at the conference hotel. The workshop dinner takes place at “Kloster Andechs” located in the hills above the eastern shore of Lake Ammersee in the middle of Upper Bavaria’s Five-Lakes Region (http://www.andechs.de).

General Information

Friday, Oct. 01, breakfast (7:00 – 8:00) and lunch (12:30 – 13:30) will be served at the conference hotel.

Clothing
To warm up for the workshop dinner attendees are invited to have an easy 40 minutes walk up the hill to “Kloster Andechs”. Sturdy footwear and a rain coat are recommended.

Talks and Posters
The size of the Posters is A0-Portrait. Mounting material will be provided. Attendees are asked to send an original PDF to seworkshop@frm2.tum.de to be included on the workshop DVD. Time per presentation including discussion is 25 minutes.

Talks will be presented by a beamer. Recommended format: Windows PowerPoint. Copies of the presentations will be included on the workshop DVD and should be forwarded to seworkshop@frm2.tum.de until Monday , Sep. 27.

Workshop Dinner
The workshop dinner takes place at “Kloster Andechs”. Located on the Holy Mountain above the eastern shore of Lake Ammersee in the middle of Upper Bavaria’s Five-Lakes Region, Andechs Monastery is easily visible from far away. For more than half a millennium it has been a cherished destination for pilgrims. In Andechs the Benedictine tradition of hospitality can be enjoyed together with the relaxed friendly atmosphere that has always been typical of Bavaria (see http://www.andechs.de)

For warm up the workshop attendees are invited to climb to the top of the hill the “Kloster Andechs” is located. Flanked by steep sides right and left of Kiental or Kien Brook, a four-kilometer/two-and-a-half mile mountain trail leads from Herrsching to Andechs.. The easy hike will take about one hour. Prior to the dinner we relax by either enjoying a guided tour of the distillery and it is well worth visiting the monastery and church respectively.

Later on we will enjoy typically Bavarian dishes and specialties.

General Information

Workshop Hotel

Arrival and departure

Your room key also serves to lock the entrance doors. Please remember to return your room key to the reception desk at the time of departure.

You are kindly requested to vacate your room by 9.00 a.m. at the day of your departure.
You may leave your luggage in the lockers in the basement below the reception.

If you have arrived by car, please use the parking lot below Rieder Straße as the parking space near the entrance is reserved for lecturers' vehicles.

The reception will be staffed from Monday to Friday between 8.00 a.m. and 19.00 p.m.
On Saturdays and Sundays it will be staffed by appointment only.

Telephone and Internet

If you wish to make a phone call simply dial either dial 7 or 9. An outside line is available as soon as you can hear the free-line signal.

Your room number (three digits) is also your personal extension number
For example for room no. 130: (08152) 938 130
or for room no. 002: (08152) 938 002

Please pay your telephone bill at the reception prior to your departure. The price of one tariff unit is € 0.15.

In the basement you will also find a payphone. Phone cards are available from the reception desk.

All our rooms have internet access. The socket is next to the telephone connection. Networks can be directly accessed. A lobe is available from the reception.

Several PCs in our internet room, which is located below the reception, provide an opportunity for working as well as internet access and e-mail facilities.

Important Telephone Numbers

Internal Lines:

• Reception / issue of keys	000
• Emergency service / weekly service	281
• Secretariat	285
• Domestic management	278

External Lines:

• Doctor / emergency call	(08152) 191 212
• Police / emergency call	110
• Fire department emergency medical service	112
• National directory enquiries	11 8 33
• International directory enquiries	11 8 34

In case of ermergency

Please help us to ensure safety within the House.

Information regarding first aid is available from the reception. A list of doctors on duty is posted at the information board.
Emergency call 0175 - 161 92 22

There are fire extinguishers on every floor of our house. Please be aware of the emergency exits (see signs).

Information

Information leaflets and brochures on the House of Bavarian Agriculture and on excursions into the vicinity are available from the reception.

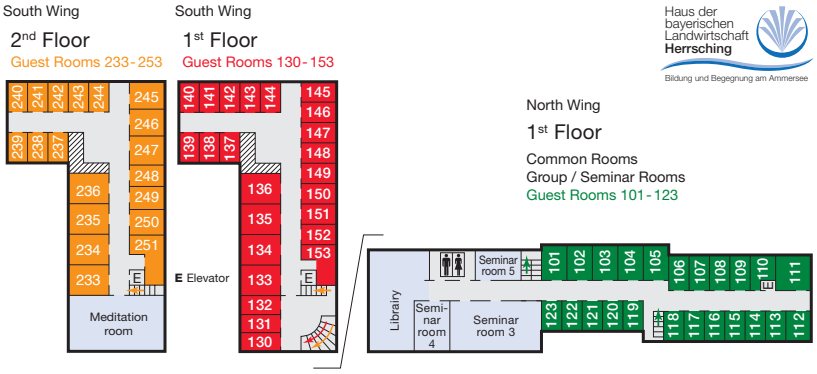
The info board in the lobby shows you which seminars and events are currently offered. Faxes and other messages to you are also left on the info board.

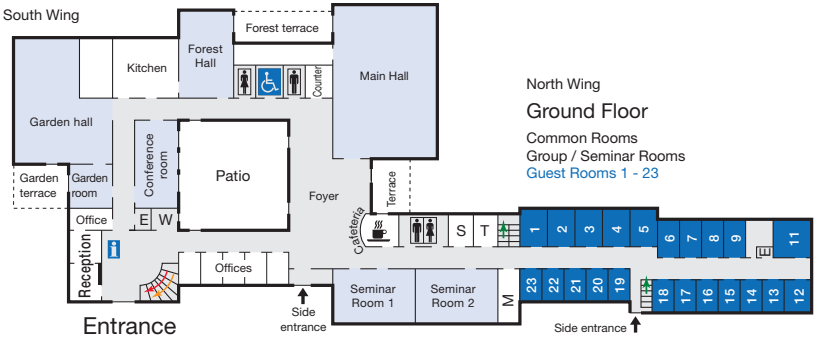
Several daily papers are available in the reading corner which is situated below the reception.

Journals and a variety of books are at your fingertips in our library on the upper floor, and our reading room invites you to linger.

General Information

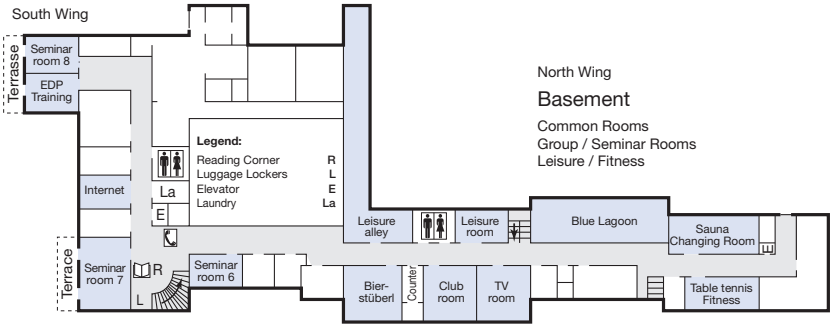
Workshop Hotel





If the reception is closed please call 281

E Elevator, **W** Wardrobe, **S** Seminar Secretariat, **T** Teaching Materials, **M** Media Room



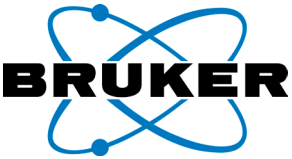
General Information

Sponsors

Oxford Instruments NanoScience
www.oxinst.com

Oxford Instruments offers the workshop dinner which will take place at “Kloster Andechs”.

Forschungs-Neutropnenquelle Heinz Maier-Leibnitz (FRM II)
www.frm2.tum.de



Bruker ASC
www.bruker-est.com

Bruker ASC provides writing materials

Carl Kurt Walther GmbH Co. KG
www.walther-praezision.de

Walter-Präzision sponsors the coffee break on Wednesday and the guided tour at “Kloster Andechs” on Thursday Sep.30.

Timetable

6th International Workshop on Sample Environment at Neutron Scattering Facilities

September 29th to October 1st 2010

	Wednesday, 29th	Thursday, 30th	Friday, 1st
7:00		Breakfast	Breakfast
7:30			
8:00	Registration at FRM II		
8:30		Wet or Dry Chair: Klaus Kiefer	Specific Topics I Chair: L. Santodonato
9:00			
9:30	Opening Session		
10:00	FRM II Sample Environment Laboratory Tour	Break	Break
10:30		"Wet or Dry – Facts from Companies" Chair: Scott Olsen	Specific Topics II Chair: M. Zolliker
11:00			
11:30			Lunch break
12:00	Departure for Herrsching am Ammersee	Lunch break	
12:30			NMI 3: SE-JRA Meeting
13:00	Lunch break	Poster Session	
13:30			
14:00	"Recent Activities and Trends in Neutron Scattering Facilities I" Chair: E. Lelièvre-Berna		Closing Session E. Lelièvre-Berna, J. Peters
14:30			
15:00			
15:30			
16:00	Break	Workshop dinner (16:00 departure)	
16:30			
17:00	"Recent Activities and Trends in Neutron Scattering Facilities II" Chair: Zoe Bowden		
17:30			
18:00			
18:30			
19:00	Dinner		

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Wednesday, September 29th

08:00 Registration at FRM II

09:30 Opening Session
J. Peters
Address of Welcome by K.Seebach

10.00 FRM II SE-Lab Tour
organised by H.Kolb

12:00 Departure for Herrsching am Ammersee

13:00 Lunch

14:30 **Session "Recent Activities and Trends in Neutron Scattering Facilities I"**
Chair: E. Lelièvre-Berna 16

14:30 **Sample environment at ISIS**
O. Kirichek, ISIS Facility, STFC, Rutherford Appleton Laboratory, UK 17

14:55 **The ORNL User Partnership Program for Sample Environment Development**
L. Santodonato, Oak Ridge National Laboratory, Oak Ridge, Tennessee 18

15:20 **Sample Environment News from the Helmholtz Zentrum Berlin**
K. Kiefer, Helmholtz Zentrum Berlin, Berlin, Germany 19

15:45 **Break**

16:15 **Session "Recent Activities and Trends in Neutron Scattering Facilities II"**
Chair: Zoe Bowden 20

16:15 **Sample environments at Japan Atomic Energy Agency**
K. Kaneko, Japan Atomic Energy Agency, Ibaraki, Japan 21

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Wednesday, September 29th

16:40 **Current status of sample environment in MLF J-PARC**
S. Kawamura, J-PARC Center, Ibaraki, Japan 22

17:05 **Status of Sample Environment Projects at the Bragg Institute**
P. Imperia, ANSTO, Lucas Heights, Australia 23

17:30 **Sample Environment Operations at the Bragg Institute: challenges and developments**
S. Olsen, Bragg Institute, ANSTO, Lucas Heights, Australia 24

17:55 **Update on Sample Environment at ILL**
E. Lelièvre-Berna, Institut Laue Langevin, 6 rue Jules Horowitz, 38042 Grenoble, France 25

19:00 Dinner

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Thursday, September 30th

7:00	Breakfast	
08:30	**Session "Wet or Dry"** Chair: Klaus Kiefer	26
08:30	**Variable High Pressure at Low Temperatures** **H. Weiß**, Forschungs-Neutronenquelle Heinz Maier-Leibnitz (FRM II) Garching, Germany	27
08:55	**The Orange Cryostat: from Wet to Dry** **O. Losserant,** Institut Laue Langevin, 6 rue Jules Horowitz 38042 Grenoble, France	28
09:20	**10 Years Dry Systems at FRM II, a Field Report** **J. Peters,** Forschungs-Neutronenquelle Heinz Maier-Leibnitz (FRMII) Garching, Germany	29
09:45	**Novel Sample Cans at Oak Ridge** **C. Redmon,** Oak Ridge National Laboratory, Oak Ridge, USA	30
10:15	Break	
10:15	**Session "Wet or Dry – Facts from Companies"** Chair: Scott Olsen	31
10:15	**Latest product developments from Oxford Instruments for neutron scattering applications.** **H. Albrecht,** Oxford Instruments, Abingdon, UK	32
10:40	**Conduction-cooled superconducting magnet systems at BNG** **C. Boffo,** Babcock Noell GmbH, Würzburg, Germany	33
11:05	**World Record High Field Magnet for Neutron Scattering** **A. Sacchetti,** Bruker Biospin AG, Fällanden, Switzerland	34

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Thursday, September 30th

11:30	**Some recent developments in the design of superconducting magnets and ultra low temperature systems for neutron studies** **P. Penfold,** Scientific Magnetics, Abingdon, UK	35
11:55	Discussion: Next Generation of Top Loading Cryostats – Requirements and Specifications	
12:30	Lunch	
13:30	Poster Session Option: parallel closed session NMI 3: SE-JRA Meeting (1h)	
16:00	Departure for workshop dinner	

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Friday, October 01st

7:00	Breakfast	
08:30	**Session "Specific Topics I"** Chair: L. Santodonato	36
08:30	**The High-Pressure Preferred Orientation Neutron Diffractometer HIPPO** **S. Vogel,** Los Alamos National Laboratory, Los Alamos, USA	37
08:55	**Neutron sample environments for biointerfaces** **B. Nickel,** Ludwig-Maximilians-Universität, München, Germany	38
09:20	**Multi purpose gas handling for automated in-situ gas adsorption measurements** **D. Wallacher,** Helmholtz Zentrum Berlin, Berlin, Germany	39
09:45	**Neutron scattering investigations in extreme sample environments** **T. Chatterij,** Institut Laue-Langevin, Grenoble, France	40
10:10	Break	
10:40	**Session "Specific Topics II"** Chair: M. Zolliker	41
10:40	**Yet another Helium Cell for Neutron Experiments at mK Temperatures** **M. Bartkowiak,** Paul Scherrer Institut, Villigen, Switzerland	43
11:05	**Universal Standard for Instrumentation** **J. Gonthier,** Institut Laue Langevin, Grenoble, France	44
11:30	**High pressure clamp cells for neutron scattering** **R. Sadykov,** Institute for Nuclear Research RAS, Moscow, Russia	42

Agenda

Friday, October 01st

12:00	Lunch
13:30	NMI 3: SE-JRA Meeting
14:30	**Closing Session** by E. Lelièvre-Berna, J. Peters
15:00	**Departure for Munich**

Recent Activities and Trends in Neutron Scattering Facilities I

Sample environment at ISIS

Oleg Kirichek
ISIS Facility, STFC, Rutherford Appleton Laboratory, UK

The ORNL User Partnership Program for Sample Environment Development

Louis Santondonato

Oak Ridge National Laboratory, Oak Ridge, Tennessee

The ultimate motivation for developing new sample environment equipment is to enable new science. Therefore, many scientists may be interested in collaborative development opportunities supported by user facilities. With this in mind, Oak Ridge National Laboratory (ORNL) has launched a user partnership program for sample environment development at the Spallation Neutron Source (SNS) and High Flux Isotope Reactor (HFIR). Several productive collaborations are already under way, and the new program will fund even more projects through a simple process, initiated by filling out a one-page proposal. The scope is relatively small-scale (but high impact!) projects with a materials budget between $5000 and $20000 and some additional funds available to travel to ORNL and participate in equipment commissioning. Proposals may make use of existing equipment (e.g., designing a special insert for an existing cryostat). Interaction between users and ORNL staff (Sample Environment staff, instrument scientists, etc.) will be a key consideration for successful proposals, as well as a deliverable that will benefit the larger user program at SNS and HFIR. This poster gives further details (also available at http://neutrons.ornl.gov) and also highlights some collaborative R&D projects already underway.

Sample Environment News from the Helmholtz Zentrum Berlin

Klaus Kiefer

Helmholtz Zentrum Berlin, Berlin, Germany

The Helmholtz Zentrum Berlin (HZB), with its research reactor BER II, offers research opportunities for neutron scattering experiments with a focus on extreme sample environments such as very low temperatures and high magnetic fields. In addition, a suite of laboratories complements the neutron scattering experiments and allows scientists to get additional information about various physical properties. In the last years both the expertise and range of accessible environments as well as the combination of neutron and lab measurements has been strengthened. The talk will show highlights of these developments.

Recent Activities and Trends in Neutron Scattering Facilities II

Sample environments at Japan Atomic Energy Agency

Koji Kaneko

Japan Atomic Energy Agency, Ibaraki, Japan

There exists two major neutron sources, steady reactor source JRR-3, and a 1 MW pulsed neutron source J-PARC, at the same site in Tokai, Japan. JRR-3 is stably in operation for last two decades. In total more than 30 instruments are run by Japan Atomic Energy Agency (JAEA) and university groups. I will give a brief overview on sample environment, such as high-field magnet, low temperature apparatus, pressure cell and so on, in JRR-3. Finally, I introduce a planned new superconducting magnet, and a time-of-flight single crystal diffractometer SENJU aiming for structural analysis under extreme condition in J-PARC which is under construction and will be received the first beam in next summer.

Current status of sample environment in MLF J-PARC

Seiko Ohira-Kawamura
J-PARC Center, Ibaraki, Japan

Materials and Life Science Experimental Facility (MLF) at J-PARC started the user program in December 2008. Currently 12 neutron beamlines are in operation or commissioning, and various neutron experiments have been performed there in wide range of scientific researches and industrial applications. With increasing the number and variety of experiments, various sample environment (SE) equipments such as high- and low-temperature, high magnetic field devices will be required. At the beginning stage, standardization of the SE equipments is one of the most important things. Especially in our country, it often happens that each instrument carries and operates SE devices independently. This situation results in an excess of the cost and incompatibility among the instruments unless we have any guidelines. Thus the SE team has discussed the SE-protocol, in which flange size, distance from the sample position to the bottom of the flange, thermometers, controllers etc. are standardized for the neutron experimental instruments. This should bring about saving the cost and manpower, increasing compatibility and sharing technique. The SE team is now discussing user support system in SE, preparation of the SE area, and so on. The technical staff members further started working on practical things such as cooling test of cryostats.

Status of Sample Environment Projects at the Bragg Institute

Paolo Imperia

ANSTO, Lucas Heights, Australia

The Bragg Institute received from the Australian Government at the height of the global financial crisis a sizable grant for the construction of a new guide and a set of new instruments, Emu, Dingo and Bilby. Together with previously funded instruments in a more advanced project or construction phase, Kookaburra, Sika and Pelikan, the fauna of the Institute is getting complete with an entire set of new instruments due in the next 3 or 4 years. Sample Environment too received a fair share of funding and the new projects include a new 12 T asymmetric vertical magnet, a dilution system, a gas handling and vapour mixing systems for loading and sorption measurements. Besides this new equipment a new methane gas rig for in-situ study of methane-hydrates formation is in an advanced project phase. The status of these projects and implication for the operation team in the near future will be discussed.

Sample Environment Operations at the Bragg Institute: challenges and developments

Scott Olsen

Bragg Institute, ANSTO, Lucas Heights, Australia

After initially reaching full power in late 2006, the new reactor OPAL was shut down until mid 2007 to fix a design issue. In the last 2 years the reactor has been running for increasingly longer periods and reached 270 operating days in the year ending 30 June. The target for the next 12 months is 300 days. This rapid increase has given rise to numerous operating challenges for the sample environment group.

We are working closely with our user community to have them design and use specific sample environment for their own research programs. A significant challenge has arisen in that Australian Standards for pressure vessels give no exemptions (unlike say British Standard EN5500) for research vessels and also cover all vacuum vessels.

Recently commissioned equipment include 2 new toploading cryofurnaces; for SANS an 11 Tesla horizontal magnet with ^{3}He fridge insert, a 300°C 10 position sample changer and a stopped flow mixing cell. For the reflectometry a 1 Tesla electromagnet with cryocooler and an impedence spectrometer, and for strain scanning a furnace and environmental chamber for the 100 kN load frame.

Equipment to be commissioned by the end of the year includes a six axis robot for automated sample changing into a cryogenic vessel and for texture measurements and a rapid crystal sample cooler for the quasi laue diffractometer.

The most successful in house designed sample environment equipment has been the automated robotic sample changer, responsible for over 50% of the published papers on the High Resolution Powder Diffractometer, Echinda.

Update on Sample Environment at ILL

Eddy Lelièvre-Berna, N. Belkhier, E. Bourgeat-Lami, J. Chastagnier, A. Filhol, J. Gonthier, J.-P. Gonzales, J.-L. Laborier, F. Marchal, P. Martin, Y. Memphis, P. Mendes, O. Losserand, C. Payre, F. Thomas, X. Tonon, S. Turc

Institut Laue Langevin, 6 rue Jules Horowitz, 38042 Grenoble, France

During these past two years, we have pursued our efforts for providing much better support to our users. We now have four Paris-Edinburgh presses (two VX-1 and two VX-5) and a fully automated rack allowing a very fast and precise control of the pressure over a wide range of temperatures. Our resistive furnaces are now also controlled automatically, safely and reliably. Two new asymmetric vertical-field cryomagnets featuring zero-boil option have been acquired and are in commissioning: a 10 T for TAS and a 7 T for reflectometers. The 9 MHz flipper we have constructed with the aim to speed up or slower neutrons and the 17 T SANS magnet acquired by T. Forgan have also been commissioned successfully on IN15 and D22 respectively.

After long investigations on the aerodynamic technique, we have found a way to levitate samples way above the nozzle and tests with melting samples are now on track. In the coming months, we will acquire two fully automated gas sorption systems that will be used with redesigned sample sticks, a large dilution refrigerator able to host a press, start the design of a new Cryopad dedicated to the measurement of the neutron electric dipole moment and the industrialisation of electronics allowing the automatic settings of the controllers. These electronics are based on a new standard that we propose to call USI and that will be presented during the conference (Universal Standard for Instrumentation)

Wet or Dry

Variable High Pressure at low Temperatures

Herbert Weiß

Forschungs-Neutronenquelle Heinz Maier-Leibnitz (FRM II), Garching, Germany

The new high-pressure cryostat is presented. The static force ranges from 220 kN repulsive force up to 430 kN compressive force. The indenters with 16 mm diameter yield a basic pressure of 20 kbar. The pressure cell can carry samples of up to 30 mm length. The 0 to 10 Hz dynamic force capability is accomplished by a powerful aggregate with a 30 kW hydraulic pump. The dependency of the dynamic pressure amplitude on the frequency is shown in some detail. Finally, the design of the cooling system is explained, especially the application of FEM and the influence on the position of the cooling clamps. The estimated end temperature is well below 10 K.

The Orange Cryostat: from Wet to Dry

Olivier Losserand, Xavier Tonon, Eric Bourgeat-Lami and Eddy Lelièvre-Berna

Institut Laue Langevin, 6 rue Jules Horowitz, 38042 Grenoble, France

In the sixties, the cryostats consisted in a vessel filled with liquid nitrogen or helium suspended in a vacuum tank. The cryostat was warmed up and opened for exchanging the sample and the consumption of cryogen was quite huge, especially at elevated temperature when a heater was fitted on the sample holder. The concept of the variable temperature insert developed at ILL in the seventies simplified enormously the life of the users. The Orange Cryostat was born, featuring a top-loading access, a low boil-off allowing to hold a week-end, and a modularity facilitating the exchange of the tail.
In the eighties, several new generations of the Orange Cryostat appeared. The first one, called Orange Cryofurnace, extended the high temperature limit from 320 to 550 K. This could be achieved by replacing the indium seal with a stainless steel / copper junction. The next ones extended the low limit with the addition of a dilution refrigerator (insert inside a cryostat and dilution cryostats).
During the last decade, the specifications of the cold heads have made big progress while the cost of the helium gas has increased. The total cost of an Orange Cryostat (investment + operation) is still attractive but less than before compared with a dry cryostat simplifying the work of users. We present a dry version of the Orange Cryostat and the difficulties encountered with the use of cold-heads. Indeed, their apparent ease of use hides a number of issues. In particular, the cooling power of a cold-head cannot compete with the presence of a liquid helium bath and the impossibility to tune the cooling power generates temperature gradients. The final release features performances similar to those of an Orange Cryostat.

- Cryomech - http://www.cryomech.com
- Sumitomo - http://www.shicryogenics.com
- TransMIT - http://www.cryo.transmit.de

10 Years Dry Systems at FRM II, a Field Report

Jürgen Peters

Forschungs-Neutronenquelle Heinz Maier-Leibnitz (FRMII), Garching, Germany

Initiated by increasing costs for cryoliquids and the absence of a helium recovery system at the FRM II the Sample Environment group started in 2000 to think about cryogen free concepts for low temperature applications. At this time dry refrigerator systems were hardly offered by commercially suppliers. In 2001 we developed the first prototype of a top loading cryostat based on a pulse tube manufactured by GILTec and in close cooperation with the company CryoVac.
In order optimize the performance of this prototype the FRM II started a cooperation with VeriCold (former GILTec) resulting in the first FRM II type CCR completely developed at FRM II. In 2003 the first dry ^{3}He insert precooled by a CCR was running at FRM II. Now we have a whole zoo of sample sticks and a couple of ^{3}He and dilution inserts in operation. The talk summarizes the state of development at the FRM II, pros and cons of the technique and problems we had to struggle over the years.

Novel Sample Cans at Oak Ridge

Chris Redmon
Oak Ridge National Laboratory, Oak Ridge, USA

Oak Ridge National Lab has been developing a new concept of closed cycle refrigerator sample cans utilizing commercially available technologies. The goals involve bigger diameters, thinnest possible walls, indium-free seals, & increased ease of use by the scientific staff. We will present elastic & inelastic discoveries with various cans, different seal designs, challenges to these concepts & final conceptual design of the next generation of cans.
ISIS Recondensing High Field Magnets and Zero Helium Boil off Operation
The recondensing high field magnets at ISIS have zero boil under static conditions, we now look at ways in which to make the magnets exhibit zero boil off under dynamic conditions.

Wet or Dry – Facts from Companies

Oxford Instruments and the Neutrons 2010

Herbert Albrecht
Oxford Instruments, Abingdon, UK

Oxford Instruments did always engage in the development of state of the art environments for Neutron research. Over the last 2 years progress was made in new magnets, new sample environments and convenience for the user and the neutron research centers. New magnets as very compact small angle scattering magnets are discussed. Recondensing and cryogen free systems are convenience factors allowing to concentrate more on research. Dedicated sample temperature environments for both cryogenic option are presented and discussed.

Conduction-cooled Superconducting Magnet Systems at BNG

Christian Boffo

Babcock Noell GmbH, Würzburg, Germany

At Babcock Noell GmbH we are technology leaders in the design and fabrication of superconducting systems for accelerator and fusion facilities. In order to match the demand for special applications, in the last years we extended our capabilities to conduction-cooled units. In 2009, in collaboration with FZJ, we delivered the new neutron Spin-Echo spectrometer for the Spallation Neutron Source in Oak Ridge in USA. This system consists of two 280 mm warm bore 1.8 Tm actively shielded solenoids each cooled by two PT cryocoolers. The magnets have been already successfully tested at SNS, setting a new level in performance in the field. In 2009 we also completed the study for a 5T split pair magnet for FRM II. This is an 80 mm bore NbTi system cooled by 2 cryoccolers. The proposed design allows for a 15 degrees beam window and split angle orthogonal field. At the moment we are completing a conduction-cooled superconducting undulator for the ANKA light source at KIT.
In this presentation we will describe the main design and fabrication issues related to conduction-cooled systems with practical examples from our experience.

World Record High Field Magnet for Neutron Scattering

Andrea Sacchetti

Bruker Biospin AG, Fällanden, Switzerland

The world's highest-field superconducting split-pair magnet for neutron scattering, developed and produced by Bruker Biospin AG, provides a maximum field of 16 T, i.e. more than 1 T higher than the previous highest field for such a magnet. It is also the first high-field split-pair magnet equipped with active-shielding technology. Moreover it can be operated in asymmetric mode up to 14 T, which is a prerequisite for a new class of experiments using the scattering of polarized neutrons in high magnetic fields.

In addition to the magnet, a new split-pair cryostat with HTS current leads, VTI (Variable Temperature Insert), and power supply was developed. The VTI offers a wide temperature range from 2 K to 300 K and was designed in collaboration with the Institut Laue-Langevin (ILL) in Grenoble, France.

The development and tests carried out at Bruker to achieve the goals of this pioneering and challenging project as well as the successful installation at SNS (Oak Ridge, USA) will be presented.

Some recent developments in the design of superconducting magnets and ultra low temperature systems for neutron studies.

Peter Penfold

Scientific Magnetics, Abingdon, UK

During the past five years, Scientific Magnetics, based in Oxfordshire, UK has worked with several neutron scattering facilities around the world to deliver bespoke high magnetic field and low temperature equipment for sample environment. Requirements from these facilities have included multi-axis and vector field capability, actively shielded magnet systems and asymmetric field profiles for polarised neutron studies. Cryogenic systems have also been designed for Helium recondensing and cryogen free systems.

Scientific Magnetics works closely with BlueFors Cryogenics Oy ltd of Helsinki, who design and manufacture cryogen free dilution refrigerator systems. The two companies are jointly designing and manufacturing a number of cryogen free systems which provide low temperature and high magnetic field sample environment.

Specific Topics I

The High-Pressure Preferred Orientation Neutron Diffractometer HIPPO

Sven Vogel

Los Alamos National Laboratory, Los Alamos, USA

The HIPPO beam line at the Manuel Lujan Neutron Scattering Center at the Los Alamos Neutron Science Center (LANSCE) is a high-flux, moderate resolution general purpose neutron diffractometer with a special focus on texture and high pressure applications. The beam line was commissioned in 2002 and has been part of the DOE/BES funded LANSCE user program since. In this presentation we will give an overview over the available sample environments of HIPPO for low and high temperature (including the capability to measure texture), gas and anvil pressure cells (with maximum pressures of ~0.6 GPa and ~15 GPa, respectively), automated sample changer, load frame (100 kN), creep rig (5 MPa, ~1000 °C), super-high temperature furnace (up to 2400 °C), and magnet (~1.5 T). We will also briefly discuss new sample environments currently under development such as our low temperature/high pressure device (~30 K, 15 GPa) or the nSEC battery cell.

Neutron sample environments for biointerfaces

Bert Nickel

Ludwig-Maximilians-Universität, München, Germany

We have developed a microfluidic neutron sample cell which embeds a Si block or similar substrates for neutron reflectometry. The cell combines a large surface area (5000 mm^2) with a low liquid volume (2 ml). This allows using rare biomolecules such as deuterated peptides in reasonable quantities. The cell provides optical access to a high resolution (63x) long distance objective via a quartz window. This allows us to employ standard microscopy techniques to characterize the biointerface using fluorescence techniques before and after the neutron measurement. The techniques are used to confirm homogeneity and fluidity of lipid bilayers as a quality control prior to the neutron experiment. Also, binding of labeled proteins to the bilayer can be evaluated. The cell was used at Refsans, N-Rex^+, and Amor and some highlights will be shown.

Multi purpose gas handling for automated in-situ gas adsorption measurements

Dirk Wallacher

Helmholtz-Zentrum Berlin, Berlin, Germany

Neutron scattering investigations in extreme sample environments

Tapan Chatterji

Institut Laue-Langevin, Grenoble, France

I shall review the results of neutron scattering investigations on several magnetic materials at millikelvin temperatures, under high magnetic field up to 14 T and also under hydrostatic pressure up toabout 30 kbar. I shall describe and discuss the experiments where some of these extreme sample environments were combined. The results of our neutron scattering investigations of hyperfine-induced nuclear spin ordering and nuclear spin waves in Nd_2CuO_4 and related compounds at millikelvin temperatures will be discussed in some details. I shall also describe the results of our recent neutron scattering investigations on the magnetic structures, magnetic (H,T) phase diagram and spin waves in newly discovered multiferroic meterials $TbMn_2O_5$, YMn_2O_5, $DyMn_2O_5$ and CuO. The pressure-temperature phase diagram of the Kondo lattice compound CeSb will be discussed. Finally I wish to discuss the new physics that can be investigated if the present sample environment limits could be extended to a reasonably moderate amounts.

Specific Topics II

High Pressure Clamp Cells For Neutron Scattering

Ravil Sadykov

Institute for Nuclear Research RAS, Moscow, Russia

High pressure clamp cells up was made from TiZr zero alloy, hard Al and hard nonmagnetic HNU (NiCrAl) alloys for TOF-method on the pulse and a constant power neutron sources are presented in this report. All this is cells as for powder and single crystal as for diffraction and inelastic neutron scattering studies possible putting in the typical cryostats (on the dilution fridge insert) and high magnetic fields cryostat up to 6-10T. Single crystal or powder NaCl (a pressure calibrant) and Fluorinert (a pressure medium) were used in all experiments on the neutron sources SINQ (Swiss), ISIS (UK), HMI (Germany) and ILL (France). We are made test a number of type Fluorinert and find that limits of solidifications distingvish for different Fluorinert and max. of this limit is for FC87=23kbar. Some of these cells were used for the investiagations of the magnetic spiral in $ZnCr_2S_4$, $CsCuCl_3$ and MnSi under pressure. For investigation of form-factor dependence of magnetic localized moments in $CePd(Rh)_2Si_2$ under pressure up to 40kbar and H=10T by using polarized neutrons on D3(ILL) we was made the a new nonmagnetic composite piston/cylinder type cell from TiZr+HNU

Yet another Helium Cell for Neutron Experiments at mK Temperatures

Marek Bartkowiak

Paul Scherrer Institut, Villigen, Switzerland

Neutron experiments at very low temperatures have proven to be a powerful tool to study low temperature ordering phenomena and low temperature phases. To obtain reliable sample temperatures down to the mK regime good thermal contact between the dilution refrigerator and the sample has to be assured. However, this is a difficult endeavour in particular for nonmetallic or powder samples. We have successfully equipped a Kelvinox-VT dilution refrigerator with a set of capillaries to be able to fill a vacuum cell with Helium-4 at the base temperature of the dilution refrigerator.
We will describe the general dimensioning of the system, discuss several construction details and give some performance data on solid Helium-4 experiment.

USI: Universal Standard for Instrumentation

Julien Gonthier, Nadir Belkhier and Eddy Lelièvre-Berna
Institut Laue Langevin, Grenoble, France

The number of sample environment equipments is growing quickly and getting more and more complex. At a large facility, their installation on the instruments requires a rigorous organisation with well-known calibration curves, PID parameters, limits, etc. To reduce the costs, facilitate the installation and avoid useless movements of the electronics, we reset controllers located permanently on the instruments each time we change the environment.
This organisation may lead to troubles. For example, a sensor has been fixed but its calibration curve is not available, the calibration curve is known but the format of the data is not understood by the new controller, one has forgotten to change the limits and the indium seal will certainly melt in the coming days, the field requested is not the one expected because the power supply has been used with another magnet, etc.
We propose to avoid these problems by adopting the USI standard: a protocol that makes transparent the communication between devices and electronics. This protocol is analogous to the USB between peripherals and computers.
A USI compatible device contains a permanent memory and a CAN bus. The permanent memory contains a block of data whose format is defined by the USI standard. For reducing the amount of data and simplifying the data transfers, this block of data is in binary format.
The USI controller, also called Auto-ID, downloads the block of data from the device and extracts the header as soon as the device is plugged. This header describes the blocks of data that follows. Each block corresponds to one specific controller known at the facility. The USI controller scans the blocks and programs the electronics that are connected. If two or more similar electronics are connected, it asks the user to select the one which will be used with the device.
We present a prototype of a USI implementation for an Orange Cryostat combined with a unified control software under development.

- CAN Bus - http://www.semiconductors.bosch.de/pdf/can2spec.pdf
- PIC microcontrollers - http://en.wikipedia.org/wiki/PIC_microcontroller
- mikroC PRO for PIC -http://www.mikroe.com/eng/products/view/7/mikroc-pro-for-pic/
- USB: Universal Serial Bus -http://en.wikipedia.org/wiki/Universal_Serial_Bus

Poster Session

Sample cell for neutron reflectometry measurements combined with in-situ gas adsorption at pressures up to 10 bars in the temperature range from 100 to 420K.

Nico Grimm

Helmholtz-Zentrum Berlin, Berlin, Germany

No Title

Sebastian Gerischer
Helmholtz-Zentrum Berlin, Berlin, Germany

ISIS Recondensing High Field Magnets and Zero Helium Boil off Operation

Richard Down

ISIS Facility, Rutherford Appleton Laboratory, UK

The recondensing high field magnets at ISIS have zero boil under static conditions, we now look at ways in which to make the magnets exhibit zero boil off under dynamic conditions.

10 GPa Precision Control over Wide Temperature Ranges

Jean-Luc Laborier[1], Claude Payre[1], Nadir Belkhier[1], Rémy Bruyère[2], Paul Martin[1], Alain Pratt[2] and Eddy Lelièvre-Berna[1]

[1]Institut Laue Langevin, Grenoble, France
[2]Institut Néel, CNRS, Grenoble, France

We present a fast and very precise pressure rack for continuously loaded pressure cells and presses. This rack can charge the device at up to 2kbar of helium gas in 20 minutes, control ramps at 30 bar/min and maintain the pressure constant with variations around the set point of less than 200 mbar. It is used with continuously load cells and presses like the VX-1 and VX-5 Paris-Edinburgh. Combined with a VX-5 press, it allows to regulate quickly and precisely the sample pressure up to 10GPa at temperatures down to 3K in our cryogen-free cryostat. To achieve these performances, we use a 3 kbar compressor, two high-precision 2 kbar valves and a buffer. A Eurotherm controller maintains the gas in the buffer above the pressure required by the user and regulates the sample pressure by opening and closing the valves. One valve releases the pressure and the other injects the gas available in the buffer. For increasing (or decreasing) quickly the pressure in the press or cell, the controller disables the regulation loop and controls directly the compressor (or relief valve). To simplify the use of the rack on the instruments, efforts have been made to ease its installation and provide a very simple user interface. After plugging the power and compressed-air lines, it only necessitates to connect the press or cell, switch it on and enter the set point. In case of power cut, overpressure or shutdown of the compressed-air line, the rack automatically stops and release the pressure applied to the sample. This rack has been commissioned early this year and a second copy is under construction.

- High Pressure Research, 24 1 (2004) 219
- Patent CNRS nÂ° 04 00 515, valve distributed by Autoclave France under the licence number L0813 (http://www.autoclave-france.fr).
- Eurotherm - http://www.eurotherm.com“

SANS sample environment at ILL optimised for soft matter research

Peter Lindner, R. Schweins

Institut Laue Langevin, Grenoble, France

This contribution will show future trends in neutron scattering sample environment and highlight the contribution of SANS at the ILL in soft matter research, in particular the improvements for time resolved experiments and kinetic studies, new sample changer developments and perspectives for new rheo-SANS experiments.

- P. Lindner, R. Schweins. 2010 Neutron News 21-2 15

Levitating Samples in the Air

Paul Martin, Frédéric Marchal, Nadir Belkhier, Alain Filhol, Jad Kozaily and Eddy Lelièvre-Berna

Institut Laue Langevin, Grenoble, France

Motivated by the results of recent experiments performed in a furnace exploiting the aerodynamic levitation technique, we have investigated the possibility to levitate the sample well above the nozzle. Indeed, with the present technique, only two third of the sample escape the nozzle and scatter neutrons. Moreover even a good collimation cannot prevent some neutrons to be scattered by the nozzle itself, leading to spurious signal in the detector.
When increasing the flow of gas exiting the nozzle, the force applied on the sample increases and pushes it out of the nozzle. However, the force applied on the sample is maximum on the vertical axis of the nozzle and lower around the axis and that leads to the immediate ejection of the sample. To circumvent that problem, we have decided to add a secondary jet parallel to the main jet but directed in the opposite direction and off-centred by the size of the sample. This technique creates a twist at the sample position which may be set as high as several sample diameters above the bottom nozzle. This leads to an excellent stabilisation of the sample in the horizontal (scattering) plane. However, because of the non-laminar character of the jets, there remains some vertical oscillations. We present this technique and the results obtained with various gases, flow rates, sample sizes and densities. We also summarise the attempts performed to reduce the vertical oscillations of the sample above the main nozzle.

L. Hennet et al., Appl. Phys. Lett. 83 (2003) p. 3305

Working meeting on prospects of levitation techniques - http://www.ill.eu/sane/about-us/events/nmi3-levitation-techniques/

Preserving Helium at ILL

Patrice Mendes, Simon Baudoin, Jean-Paul Gonzales, Olivier Losserand, Yohan Memphis and Eddy Lelièvre-Berna

Institut Laue Langevin, Grenoble, France

With more than 70 cryostats and cryofurnaces, a dozen of cryomagnets and several dilution refrigerators, the operation of the ILL and CRG instruments requires more than 500 litres of liquid helium per day. This leads to about 13 tons of helium per year. We reduce the operation costs by about 40% by recovering about 95% of this nonrenewable finite resource.

The preservation of the gas is the result of a rigorous work performed on a daily basis. The volume of liquid helium is weighted before and after its allocation to an instruments or a laboratory. Gas counters are installed on all the instruments and at strategic places so that we can easily localise an increase of the losses.

In order to monitor the movements of the gas and detect an increase of the losses, we have developed an application which calculates the amount of helium used on each instrument and laboratory. This application collects the data entered on a mobile data terminal through an Ethernet connection.

We describe the organisation of the recovery system, the accounting software producing automatically monthly reports and present the mobile data terminal developed for collecting the movements of the gas in real time.

- The statistics of the ILL are summarised at http://www.ill.eu/sane/equipment/low-temperatures/lhe-ln2-ar-distribution/

- “NRC Urges U.S. to Rethink Sale of Helium Reserve”, Science 327 (2010) p. 511

High pressure neutron diffractometer “Hercules” at INR neutron facility

Sadykov R.A.[1,3], Clementyev E.S.[1,2], Axenov S.N.[1], Bulkin A.P.[4], Koptelov E.A.[1]

[1]Institute for Nuclear Research RAS, Moscow, Russia
[2]RRC “Kurchatov Institute”, Moscow, Russia
[3]Institute for High Pressure Physics, Troitsk, Russia
[4]Peterburg nuclear physics institute RAS, Gatchina, Russia

We report on a new neutron instrument at the INR neutron facility IN-06. “Hercules” is a time-of-flight diffractometer dedicated for high pressure research. This instrument is located on a thermal neutron beam. “Hercules” is equipped by a supermirror neutron concentrator to focus neutrons on the sample position and to increase the flux of the long wavelength neutrons. Press (250 ton) is a part of this instrument. The press and detectors are placed into a sealed safe which allows to perform measurements at hydrogen atmosphere. A set of different high pressure cells wish different sample volume and pressures up to 10GPa is available. “Hercules” is a medium resolution diffractometer.

Automatic sample exchange system for a large number of samples at room temperature

Akinori Hoshikawa

Ibaraki University, Tokai-mura, Japan

IBARAKI Materials Design Diffractometer (iMATERIA) has been built at BL20 at MLF in J-PARC as a high throughput powder diffractometer. Each sample will be measured in about 5 minutes at 1MW, and must be set in the vacuum chamber. We developed and manufactured an automatic sample exchange system that can store more than 600 samples at the same time at room temperature. Powder sample is packed into the cylindrical vanadium holder with an aluminum cap. Each sample is identified by an RFID tag on the top of the holder cap. There are two pre-vacuum chambers where the pressure is controlled, and each pre-vacuum chamber can transfer 12 samples into the vacuum chamber at once. It becomes possible to measure a lot of samples constantly by using two pre-vacuum chambers alternately. We introduce this automatic sample exchange system.

Development of new Cryostats at the FRM II

H.Kolb, J.Peters, M.Zollner, P.Biber

Forschungs-Neutronenquelle Heinz Maier-Leibnitz (FRM II), Garching, Germany

Beside the standard sample tube cryostat CCR developed at FRM II some neutron scattering applications need more specialised low temperature equipment to cover limited space, high cooling power, huge sample dimensions etc. The poster shows a new approach to design a compact top loading cryogenfree cryostat enabling fast sample change by means of a robot at ambient conditions.
Moreover the new development of a cryogenfree ^{3}He refrigerator dedicated to big sample size will be presented.

Pulse Tube Cryocoolers - an Option for Dry Cooling

Kai Allweins

TransMIT Center for Adaptive Cryotechnology, Giessen, Germany

Unter allen regenerativen Kühlern zeichnet sich der Pulsrohrkühler (PRK) durch das Fehlen beweglicher Teile im Kaltkopf aus. Diese einzigartige Eigenschaft resultiert in einer hohen Betriebssicherheit, reduzierten magnetischen Interferenzen sowie der Möglichkeit, eine sehr vibrationsarme Kühlung zu realisieren. Dies macht PRK zu attraktiven Kandidaten für die störarme Kühlung ohne kryogene Flüssigkeiten. Seit über 10 Jahren entwickelt und fertigt das TransMIT-Zentrum in Giessen verschiedene Typen von PRK für Betriebstemperaturen zwischen 2.2 K und 150 K. Zweistufige Systeme erreichen bei einer Temperatur von 4.2 K Kälteleistungen von 0.2 W bis 1.1 W bei Eingangsleistungen von 2 kW bis 10 kW. Demonstrierte Anwendungen dieser PRK sind beispielsweise die trockene Kühlung von Josephson Spannungsnormalen, supraleitenden Magneten oder die Vorkühlung von Sub-Kelvin Kühlern. Einstufige, sehr kompakte und leichte TransMIT-Kühler arbeiten mit Linearkompressoren bei einer Eingangsleistung von lediglich 100 W und stellen ca. 2.5 W Kälteleistung bei einer Temperatur von 80 K zur Verfügung. Alle PRK können gemäß den Anforderungen des Nutzers angepasst werden.

Hydrostatic High Pressure Capabilities at the NIST Center for Neutron Research

Juscelino Leao

NIST Center for Neutron Research, Gaithersburg, USA

The NIST Center for Neutron Research currently provides a variety of hydrostatic gas pressure apparatus ranging from 20 MPa to as high as 1.0 Gpa, and 1.5 K to 373 K that are specially designed for neutron spectroscopy. Most of the pressure equipment can be mounted in a variety of instruments throughout NCNRâ€™s facility allowing for experimental flexibility and maximizing beam time use. The available NIST Center for Neutron Research pressure equipment is presented here.

Progress on Sample Environment at SINQ

Markus Zolliker

Paul-Scherrer-Institut, Villigen, Switzerland

The equipment of sample environment devices at the Swiss spallation source SINQ is evolving continuosly. A new 6 Tesla vertical field cryomagnet was put into operation, and a new 6.8 Tesla horizontal cryomagnet is in the commissioning phase. A dilution refrigerator system with two identical sticks is expected to be delivered soon. For cryostat control, recently a small device called CCU (crostat control unit) was developed and put into operation, handling the needle valve control, liquid nitrogen refill and more. Also the crew has grown: a physicist joined the sample environment group in last automn. This allows us to support more sophisticated experiments regarding sample environment.

High-Pressure facilities at the G61 cold neutron two-axis spectrometer

Nicolas Rey

Laboratoire Léon Brillouin, CEA Saclay, Gif sur Yvette, France

We present the sample environment conditions available for neutron studies at high pressure and low temperature at the G61 spectrometer, LLB (Orphée reactor). State of the art of the technique is reviewed as well as milestones accomplished by I. Goncharenko. The high pressure generator used is the well-known LLB-Kurchatov pressure cell based on opposed anvils system. The pressure cell can be mounted by sapphire or diamond anvils therefore providing a wide accessible pressure range. Major and unique results were obtained at a record pressure of 50 GPa by I.G. at the cutting edge, illustrating the high potential of the LLB/Kurchatov cells. Their main advantages are illustrated: compact dimensions ($Ø_{ext}$ 45 mm) and Cu-Be alloy made. These two important characteristics lead to completely cover the use of the neutron probe: from structural phase transitions, especially for low-Z materials to magnetic transitions. We discuss also the future upgrade of the spectrometer including improvement of the high pressure environment, the design of a new 2D area detector and a new close cycle cryostat (4K-500K). Actual limits of the high pressure conditions and perspectives will be also addressed.

Liquid Helium Management System Berlin

Robert Wahle
Helmholtz-Zentrum Berlin, Berlin, Germany

The new control systems of spectrometers of the IBR-2M reactor

Alexander Sirotin

Joint Institute for Nuclear Research, Dubna, Russia

Timetable

6th International Workshop on Sample Environment at Neutron Scattering Facilities

September 29th to October 1st 2010

	Wednesday, 29th	Thursday, 30th	Friday, 1st
7:00		Breakfast	Breakfast
7:30			
8:00	Registration at FRM II		
8:30		Wet or Dry Chair: Klaus Kiefer	Specific Topics I Chair: L. Santodonato
9:00			
9:30	Opening Session		
10:00	FRM II Sample Environment Laboratory Tour	Break	Break
10:30		"Wet or Dry – Facts from Companies" Chair: Scott Olsen	Specific Topics II Chair: M. Zolliker
11:00			
11:30			Lunch break
12:00	Departure for Herrsching am Ammersee	Lunch break	
12:30			NMI 3: SE-JRA Meeting
13:00	Lunch break	Poster Session	
13:30			Closing Session E. Lelièvre-Berna, J. Peters
14:00	"Recent Activities and Trends in Neutron Scattering Facilities I" Chair: E. Lelièvre-Berna		
14:30			
15:00			
15:30			
16:00	Break	Workshop dinner (16:00 departure)	
16:30			
17:00	"Recent Activities and Trends in Neutron Scattering Facilities II" Chair: Zoe Bowden		
17:30			
18:00			
18:30			
19:00	Dinner		