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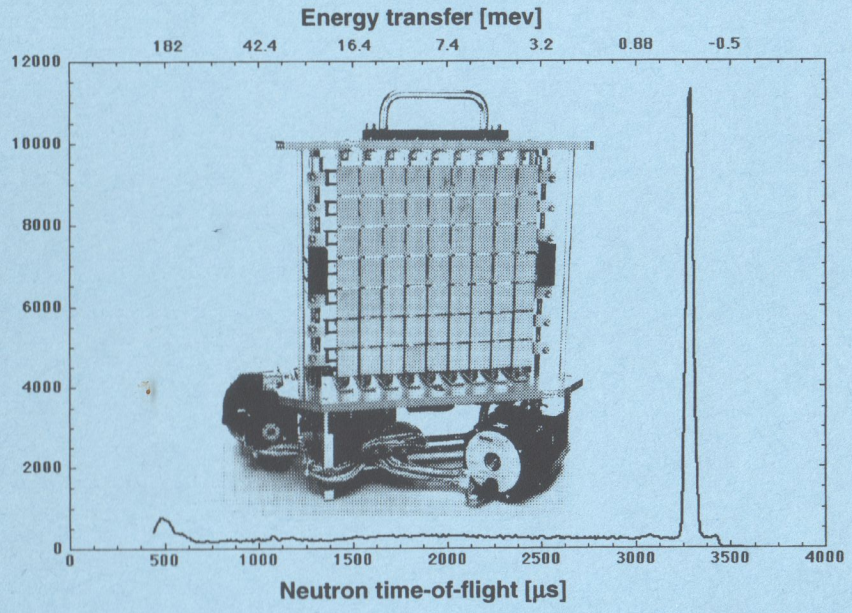
January 1999

SWISS NEUTRON NEWS



Schweizerische Gesellschaft für Neutronenstreuung
Société Suisse pour la Diffusion des Neutrons

Cover illustration:
FOCUS is operating: TOF-spectrum measured on Dec. 22 1998 with the TOF-spectrometer FOCUS at the Swiss Spallation Source SINQ. The inset shows the focusing monochromator designed and built by R. Thut. See the report "FOCUSing on taking data" by Altorfer et al. in this issue.

Impressum:

Herausgeber: Schweizerische Gesellschaft für Neutronenstreuung

Vorstand für die Amtsperiode Januar 1998 - Januar 2001:

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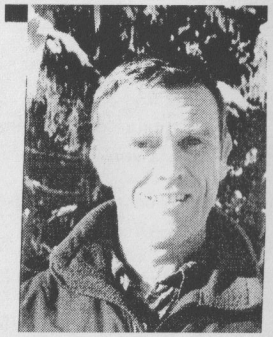
Inhaltsverzeichnis

La page du président de la SSDN

Dear members,



We have good news. During the first months of user operation of the Swiss neutron source SINQ at the Paul Scherrer Institute (PSI) some 25 research groups were able to perform over 40 experiments on four instruments (DMC, SANS, DrüchaL, TASP). About half of the experiments were presented at the last SINQ user meeting, and first interesting results were discussed in the presence of the deputy director of PSI and the members of the SINQ Scientific Council. Thus, we have again a 'home base' for neutron scattering. This undoubtedly adds additional flavour to our scientific life and increases our competitiveness. It is appropriate at this point to congratulate both the SINQ management and the instruments responsibles for there achievements. This fall, 57 new proposals came in for the second round of SINQ experiments, which confirms the interest of the national and international user community in this neutron source.

Of course, the general satisfaction did not prevent the users from making a critical assessment of the current scientific life at, and the future potential of SINQ. It was generally felt that there was room for improvement. The principal measures advocated were increasing the neutron flux, putting into service delayed instruments (e.g. HRPT and TriCS), and reinforcing the infrastructure (sample environment). These measures were considered to be essential for increasing the attraction of SINQ in the short run and securing it in the long run. Of major importance in that context are new projects and in particular those driven by users. An example is the high-pressure cell as proposed by our colleagues at ETH Zurich in this issue of Swiss Neutron News. Research groups inside and outside Switzerland are invited to participate in that project an/or submit other projects in the field of neutron scattering to SINQ. For reasons which are obvious in these times of global thinking, the projects should be well integrated into the European neutron landscape by being complementary to those on other neutron scattering facilities. Our society is ready to provide a platform for discussions on this issue and to establish contacts, if necessary, with the European Neutron Scattering Association, ENSA. Clearly, neutron scattering - like all scientific activities worthy of the name - must remain a dynamic activity, and all those who are presently benefiting from investments in the past should care about the future.

Needlees to say that the success of SINQ has an impact on the use of the high-flux reactor at the Institute Laue-Langevin (ILL). As was anticipated from the SGN/SSDN survey in 1997, the number of Swiss proposals has drastically decreased, and the total beam time allocated to Switzerland by the ILL Scientific Council during the fall meeting 1998 has been reduced by a factor of about two. Surely, this does not allow conclusions to be drawn about the future use of ILL by Switzerland. It is obvious, however, that a equilibrium between the use of ILL and SINQ will be reached soon, and that this equilibrium will depend to a large extent on the quality of SINQ and its instruments. For the time being and for quit some years to come, scientists in Switzerland will continue to use and participate in the scientific life of both facilities which are complementary. This was again demonstrated during the last General Assembly of the SGN/SSDN at which four members of our society were elected as possible members of subcommittees of the ILL Scientific Council. Thus the recent decision of the Swiss Federal Council to renew the contract between Switzerland and ILL for another five years (1999-2003; 3.5% beamtime) is fully justified.

This year our society has again grown strongly. It has now 192 members. This demonstrates the increased interest scientists from inside and outside Switzerland take in our activities, and underlines the popularity of neutron scattering as a unique tool for the investigation of condensed matter. These are also good news.

Wishing all of you a happy new year 1999

Geneva, December 1998

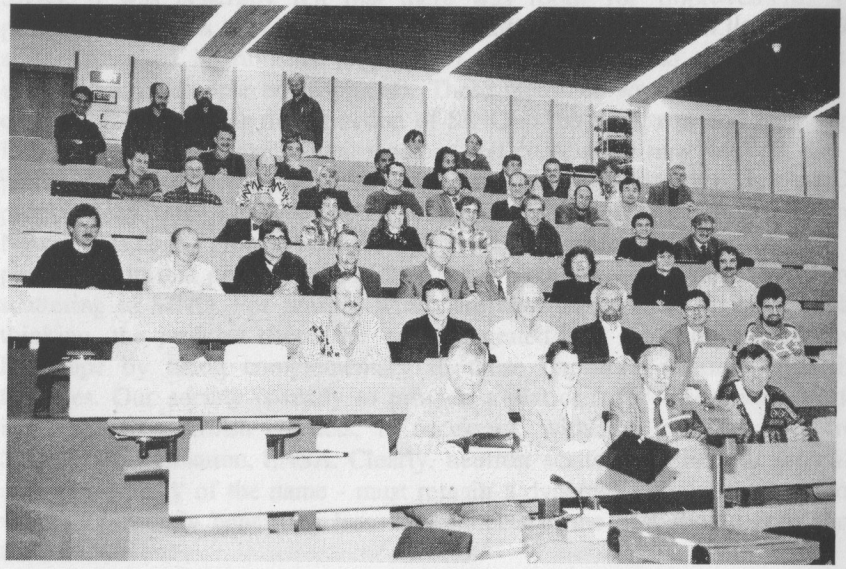
Klaus Yvon, président

1st *SINQ* User Meeting

The user meeting was held at PSI on November 27 with the participation of more than 60 scientists. The aim of the meeting was to communicate the first experiences with *SINQ*. From the 57 approved proposals in proposal round II/98 the majority of the allocated beamtime was at least partially worked off. The results and first impressions were presented in more than 20 short talks. All in all the comments and results were very positive, but the urgent need for more neutron flux was stressed by a large majority of the speakers. Target development, increase of proton current, and reduction of the width of the muon target in front of *SINQ* should have first priority in order for *SINQ* to become a very competitive medium flux neutron source. On the instrument side, many participants wished a better support with the sample environment by assigning more technical staff to this duty. The detector problem on SANS causing some problems in the start-up period- as reported by the SANS users - is in the process of being solved.

The status of the instruments was presented by the instrument responsibles. We anticipate for cycle I/99 an almost 100 % operation of DMC, DrüchaL, SANS, and TASP, while FOCUS, HRPT, and TriCS will be available partially. AMOR is scheduled to start routine operation in cycle II/99.

At the end of the event the Austrian spallation source project AUSTRON was presented by Prof. Rauch, Vienna, and Prof. Kunz from the ETH Zurich (kunz@kristall.erdw.ethz.ch) proposed a neutron high pressure cell for pressures beyond 100 kbar. People interested in high pressure work are asked to contact him in order for defining the technical specifications best suited for the *SINQ* community.



SINQ Scientific Committee Meeting (November 27-28, 1998)

Following the 1st *SINQ* User Meeting the members of the *SINQ* Scientific Committee had their meeting to discuss the status and the prospects of *SINQ* and its infrastructure. The committee wholeheartedly supports any attempt to increase the neutron flux which is the only way to make *SINQ* a full success. The major part of the agenda was the discussion of the new proposals and the beamtime allocation. In addition to the high quality standards required for both short and long term proposals, long term proposals have to address the question of feasibility and to report previous results. On this basis, quite a few of the proposals earmarked by the proposers as long term were altered by the Scientific Committee to short term status before beamtime allocation. The statistics of the proposal round I/99 is given in the adjacent tables.

Short Term Proposals
beam time in cycle I/99 (in days)

	available	requested
DMC	13	31
DrüchaL	19	0
FOCUS	24	40
HRPT	22	25
SANS	17	37
TASP	42	65
TriCS	6	6

Long Term Proposals
beam time in I/99, II/99, I/00, II/00

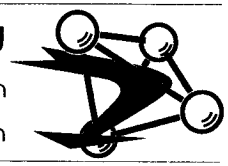
	available	requested
DMC	22	29
DrüchaL	57	83
FOCUS	18	63
HRPT	45	71
SANS	53	242
TASP	40	78
TriCS	0	0

	requested days	requested %	allocated days	allocated %	success rate %
LNS	226	31.0	121	42.31	53.54
PSI	41	5.6	9	3.15	21.95
Switzerland	106	14.5	56	19.58	52.83
Austria	5	0.7	4	1.40	80.00
Australia	16	2.2	4	1.40	25.00
Belgium	1	0.1	0	0	0
Germany	82	11.2	28	9.79	34.15
Japan	36	4.9	15	5.24	41.67
Poland	16	2.2	13	4.54	81.25
Rumania	10	1.4	0	0	0
Russia	79	10.8	12	4.20	15.19
Slovenia	2	0.3	0	0	0
Spain	3	0.4	0	0	0
Ukraine	5	0.7	1	0.35	20.00
UK	40	5.5	3	1.05	7.50
USA	62	8.5	20	6.99	32.26
Total	730	100.00	286	100.00	37.14

Laboratorium für Neutronenstreuung

ETH Eidgenössische Technische Hochschule Zürich

PSI Paul Scherrer Institut Würenlingen & Villigen



The Laboratory for Neutron Scattering (common Laboratory of ETH Zürich and of PSI Villigen) offers two temporary (two to three years)

Postdoc Positions for Physicists

Tasks:

- Position A: Responsible for the installation and operation of a neutron optical bench at the SINQ spallation source.
- Position B: Responsible for the test spectrometer TOPSI at the SINQ spallation source. Production and characterisation of metallic multilayers.
- Local contact for guest research groups
- Instrument development and installation of software for data analysis
- Scientific research in the field of neutron scattering

Requirements:

- Studies successfully completed with Ph.D. thesis
- Experience in the field of neutron and/or x-ray scattering
- Experimental skill for work with high magnetic fields and low temperatures
- Good knowledge concerning programming and software

Further information may be obtained from:

- Dr. P. Böni (phone: +41 56 310 2518, e-mail: Boni@psi.ch)

Please send your application to:

- Laboratory for Neutron Scattering, Secretariat, CH-5232 Villigen PSI, Switzerland

DA/SPRH/GRH 02/12/98
Vacancy ref.98/19-20

VACANCY FOR RESEARCH SCIENTISTS

The Institut Laue -Langevin (ILL) is an international research institute funded by France, Germany and the United Kingdom. Agreements on scientific collaboration have also been signed with Austria, Italy, Spain Switzerland and and the Czech Republic.The Institute operates the most powerful source of neutrons in the world, a 58 MW reactor, which was completely refurbished in 1995. The reactor forms the basis for a programme of research covering a wide variety of fields, supplying neutrons to a broad range of instruments, which are available to scientists from the member countries.

The posts, which are offered on a fixed-term basis, represent an excellent opportunity for young postdoctoral scientists to develop their expertise, broaden their experience and interact with leading scientists from many countries. More experienced scientists on secondment may also be considered.

For the duration of their stay at ILL, and in addition to carrying out their own research programme, successful candidates will be assigned the task of assisting ILL's visiting scientists in conducting their experiments and taking charge of the operation and improvement of the relevant instruments.

There are openings for 2 scientists in the following areas:

1 - Diffraction Group (ref. 98/19)
Applicants should have 1-2 years postdoctoral experience in neutron or X-ray diffraction and an interest in applying neutron diffraction to scientific areas that are complementary to current ILL expertise. The group studies the structure of materials using single crystals, powders, liquids and amorphous samples. We are particularly interested in recruiting in the latter areas. An interest in using large position-sensitive detectors would be an advantage. The successful candidate will take charge of the operation and improvement of a diffraction instrument. For further information please contact Dr. A. W. Hewat, Tel: (33) 4.76.20.72.13 or e-mail: hewat@ill.fr

2 - Large-Scale Structures Group (ref. 98/20)
Applicants should have 1-2 year post-doctoral experience preferably in the field of neutron or X-ray small angle scattering. The interests of the group are very wide, ranging from structural biology through colloid and polymer chemistry to solid state physics. We are particularly looking for someone with a background in physics and an interest in materials (magnetic or otherwise). The successful candidate will be involved in the development of the SANS instruments D11 and D22. For further information please contact Dr. P. A. Timmins, Tel: (33) 4.76.20.72.63 or e-mail: timmins@ill.fr

The Institute is looking for highly motivated scientists with an interest in instrumentation and having a sound practical knowledge of computing.

Successful candidates will be offered a fixed-term contract, the duration of which will be set according to their experience and qualifications but will under no circumstances exceed five (5) years. In addition to a competitive salary, certain benefits (reimbursement of removal expenses, adaptation allowance, etc.) may be offered.

Applications quoting the appropriate reference, with curriculum vitae, list of publications and the names of two academic referees, should be sent no later than **04 January 1999** to:

The Head of Personnel
INSTITUT LAUE-LANGEVIN
B.P. 156
38042 GRENOBLE CEDEX 9
FRANCE http://www.ill.fr

Call for proposals for a new high-pressure cell

Dear colleagues,

The combined availability in the near future of a state-of-the-art neutron source and a 3rd generation synchrotron source at the Paul Scherrer Institute offers unique experimental possibilities for scientists in various disciplines. These facilities could be used for experiments in a variety of sample environments. Particularly in some of our recent research projects in earth sciences it would be of high interest to have a high-pressure environment available at the Swiss Spallation Source SINQ as well as the Swiss Light Source SLS. While high-pressure X-ray experiments can easily be done using diamond anvil cells (DAC), the very small sample volume used in a DAC prohibits their combination with neutron radiation. Presently, high-pressure equipment is available at SINQ for experiments up to a maximum pressure of 1.7 GPa. This is not sufficient in order to fully exploit the potential of high-pressure research, which opens interesting new possibilities in disciplines as various as solid state physics, material sciences, chemistry and earth sciences. Since we think that there is a broad interest within the Swiss science-community for a versatile high-pressure environment at SINQ, we suggest that a consortium consisting of interested research labs/groups collectively applies for funding of a suitable pressure cell. For this purpose we would highly appreciate if you could communicate to us your interest in a neutron-compatible high-pressure cell in your research.

In order to obtain a picture of what type of pressure cell would best fit the need of the SINQ user community, it would be very helpful if you could also inform us about the desired specifications (i.e. pressure range, inelastic vs elastic scattering, temperature range ...) for an optimal pressure cell in your neutron research. Moreover, we appreciate all comments concerning this project. The deadline is February 5, 1999.

At the current status we favour the purchase of a Paris-Edinburgh cell. A first test with this cell is planned for March 1999 on the powder diffractometer DMC at SINQ. The Paris-Edinbugh cell can be used for angle dispersive neutron experiments as well as for neutron time-of-flight technique. This cell has also been used successfully for both, elastic and inelastic neutron scattering at pressures up to 26 GPa.

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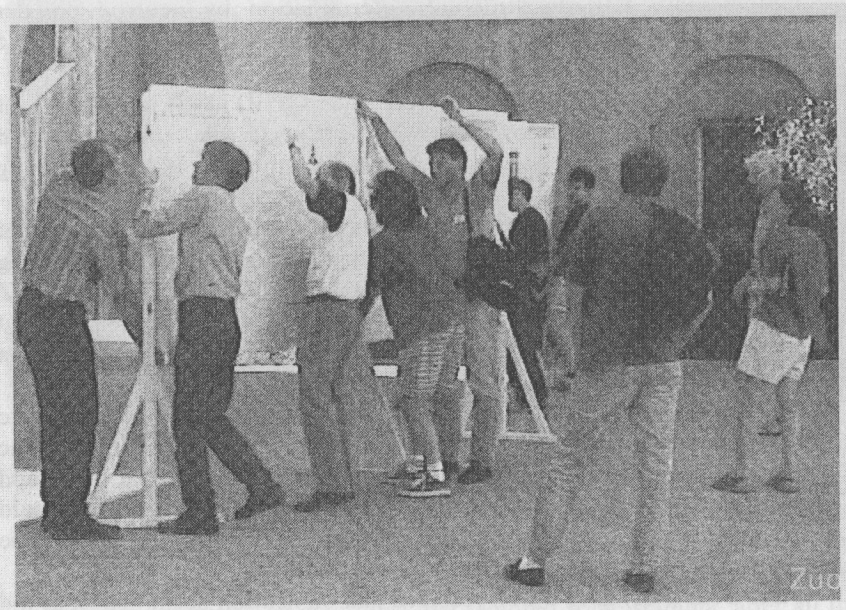
Sunny Side up: 6th PSI Summer School in Zuoz under Blue Skies

Felix Altorfer

For the sixth time scientists form around the world convened in the town of Zuoz in the Engadin to attend the PSI Summer School from August 8 – 14, 1998. *Complementarity between Neutron and Synchrotron X-Ray Radiation* was the topic of the meeting, pointing to existing and future facilities such as SINQ and SLS with their excellent research possibilities.

The broad field of neutron and synchrotron radiation research was highlighted by talks on a variety of topics such as thin films, polymers, determination of chemical and magnetic structures by powder diffraction and an introduction to neutron and synchrotron optics.



Teamwork is everything: Attendants prepare the open-air poster session

110 attendants from universities and national research institutes from 16 countries followed the talks closely and contributed to sometimes animated discussions. Once again, many young scientists participated at the summer school and the quality of their works could be seen during an open-air poster session outside the venerable walls of the Lyceum Alpinum.

W. Fischer (PSI) gave a introduction to the theoretical principles of neutron and x-ray synchrotron radiation, S. Sinha (APS, Argonne) discussed small angle scattering from porous and fractal materials. A tour from thin films to superlattices was covered by D. McMorrow (Riso) when he presented interesting aspects of magnetism in metallic thin films. The contribution of x-ray scattering to the investigation of properties such as magnetism, superconductivity, orbital order and the metal-insulator transition was demonstrated by M. Altarelli (ESRF Grenoble) in his talk on the theoretical perspective of elastic and inelastic x-ray scattering from correlated electrons.

The advantages of synchrotron radiation for high quality powder x-ray diffraction studies were discussed by A. Fitch (ESRF & Keele University), whereas E. Gray (Griffith University Brisbane, Australia) gave the complementary talk on structure determination by neutron powder diffraction. Particular attention was given to cases of short-range order and dislocations.

Theory was given due respect by H.B. Braun (PSI) in his presentation of topological excitations in low dimensional magnets where he emphasized the key role of neutron scattering in the investigation of the intriguing properties of these systems.

A comparison of neutron and synchrotron x-ray scattering for the study of magnetic structures and phase transitions was made by W. Stirling (University of Liverpool). Polymer physics was the topic of D. Richter (FZ Jülich), specifically the large scale dynamics in polymer melts. He presented theoretical aspects in conjunction with experimental results obtained from neutron spin echo measurements.

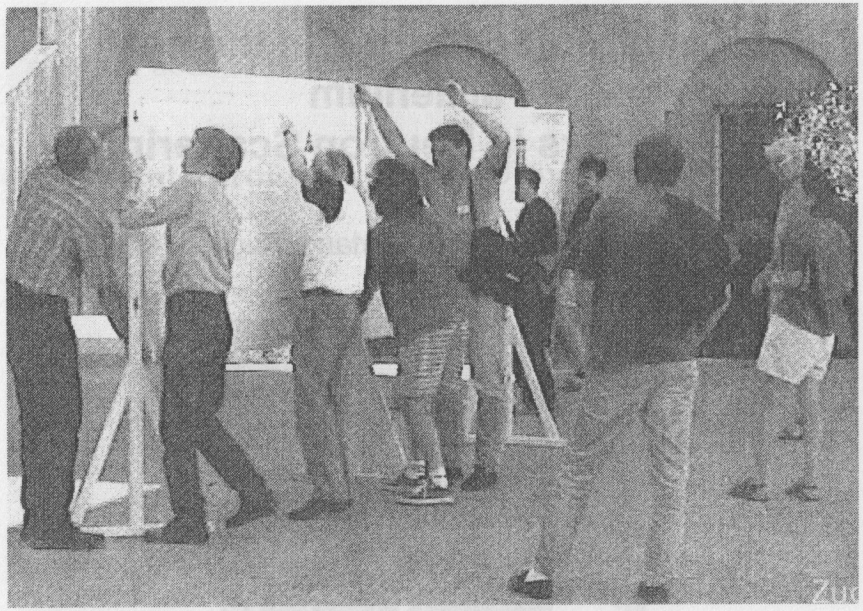
W. Buyers (NRCC, Chalk River) gave an overview on magnetic excitations and neutron scattering and discussed the shape of magnetic scattering in different dimensions. If you wished to know what one could learn from SANS measurements on vortices in superconductors you should not have missed V. Geshkenbein's (ETH Zürich) talk where he showed the usefulness of neutrons to probe the magnetic flux lines.

Peter Böni (PSI) gave a well-received talk on neutron beam optics, as did A. Freund (ESRF) on synchrotron x-ray beam optics. H. Ott (ETH Zürich) discussed his view on contemporary solid state physics and showed what is hot and what is not in today's research topics. S. Lovesey (RAL) in his summary of the school referred especially to the importance of mathematical understanding of cross sections.

Universal praise earned the flawless organization, no wonder, since W. Fischer (PSI) and A. Furrer (ETH Zürich) took care of the scientific aspects

and always optimistic conference secretary R. Bercher tackled all administrative problems successfully.

At one memorable evening, Oliver Fritz (PSI) and Fillip Ignatovic (Dubna, Russia) presented their skills during a musical soiree playing the piano to a first astonished and then gracious audience that thanked the two with long applause.



Exhausted Summer School participants enjoy the half time break

An attractive program was put together for the traditional excursion day: The sturdier part got up very early in the morning to join a river rafting expedition down the Inn river, others choose the somewhat gentler trip to explore the natural beauties of the National Park. Twenty-three preferred to climb Piz Languard, an enterprise that required some stamina, after all the mountain rises to 3262 meters.

Despite the demanding talks and presentations, a large group of football enthusiasts found some time to challenge each other at the last day of the summer school. Some showed that they are not only proficient in science but also in this game. But all of them will be happy to be back at the 7th PSI Summer School in Zuoz which will take place from August 7 – 13, 1999.

7th Summer School on Neutron Scattering

Neutron Scattering in the next Millenium (Frontiers in Neutron Scattering)

Lyceum Alpinum Zuoz, Switzerland, August 7-13, 1999

Chairman:
W. E. Fischer

Programme Chairman:
A. Furrer, ETH Zurich & PSI Villigen

Secretary:
R. Bercher

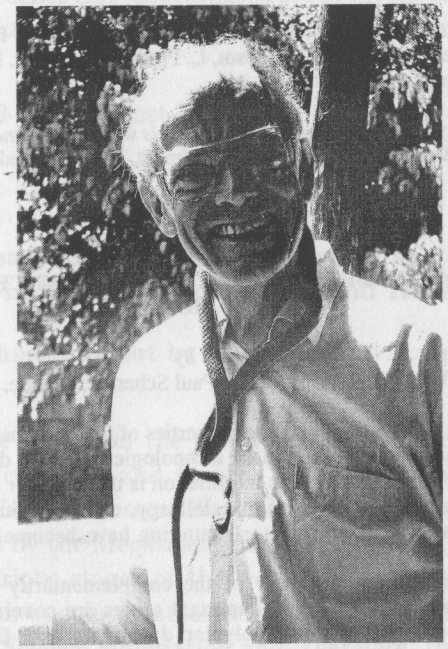
Contact: R. Bercher, LNS/PSI, CH-5232 Villigen PSI, Switzerland,
FAX: ++41 - 56 - 310 2939

Gratulation

Die Schweizerische Gesellschaft für Neutronenstreuung freut sich sehr über die Ernennung unseres Mitglieds Hans Grimmer zum

Titularprofessor an der Universität Zürich

Herzliche Gratulation!



Worüber freut sich Hans mehr? Über seine Ernennung zum Professor oder über seine neue, lebende Krawatte?

Just published

NEUTRON SCATTERING IN LAYERED COPPER-OXIDE SUPERCONDUCTORS

Edited by
ALBERT FURRER (ETH Zurich & Paul Scherrer Institute, Switzerland)

This is the first book which reviews the most important results obtained in the past decade for layered copper-oxide high-temperature superconductors by neutron scattering techniques. The following topics are thoroughly introduced, methodically discussed and highlighted with the most important results by acknowledged experts in their respective fields: static and dynamical properties of the crystal lattice (oxygen site occupation, charge transfer, charge-stripe order, phonon dispersions and density-of-states), static and dynamical magnetic correlations (phase diagrams, 2D and 3D magnetic ordering, spin waves and spin fluctuations, crystal-field excitations) and the structure of the flux-line lattice (field and temperature dependence). The 2D features of the copper-oxide perovskites are found to be essential for achieving high-temperature superconductivity by doping. The book addresses an interdisciplinary audience, both specialists and those entering the field. Emphasis is put on the fundamental properties; however, technological applications are evidently emerging from these basics.

Authors: P. Böni, Ph. Bourges, P. Burlet, P. Fischer, E.M. Forgan, A. Furrer, S.M. Hayden, W. Henggeler, M. Medarde, J. Mesot, L. Pintschovius, P.G. Radaelli, L.P. Regnault, W. Reichardt, J.M. Tranquada.

Volume 20 in *Physics and Chemistry of Materials with Low-Dimensional Structures*
KLUWER ACADEMIC PUBLISHERS (Doordrecht, Boston, London, 1998), 403 pages

COMPLEMENTARITY BETWEEN NEUTRON AND SYNCHROTRON X-RAY SCATTERING

Edited by
ALBERT FURRER (ETH Zurich & Paul Scherrer Institute, Switzerland)

Understanding and manipulating the properties of materials naturally occurring in our world and atrtificially produced by modern technologies requires detailed information on their properties on the atomic scale. This information is the basis for any kind of research in physics, chemistry, biology, engineering, metallurgy, and ceramics. Among the various experimental methods, neutron and photon scattering have become the key techniques of choice.

This book provides an overview of the complementarity between neutron and synchrotron x-ray scattering. The most important topics are covered, including structure determination, magnetic correlations, polymer dynamics, thin films and multilayers, photoemission studies, etc. They are thoroughly introduced and discussed by experts from both the experimental and theoretical side.

Authors: M. Altarelli, P. Böni, H.B. Braun, W.J.L. Buyers, W.E. Fischer, A. Fitch, A. Freund, V. Geshkenbein, E. Gray, S.W. Lovesey, D. McMorrow, H.R. Ott, D. Richter, S.K. Sinha, W.G. Stirling.

Proceedings of the 6th Summer School on Neutron Scattering, Zuoz, August 1998
WORLD SCIENTIFIC (Singapore, New Jersey, London, Hong Kong, 1998), 377 pages

Survey of the Neutron Scattering Community and Facilites in Europe

A survey report prepared for the ESF by the European Neutron Scattering Association (ENSA)

This current report presents the findings of a survey undertaken, at the request of the ESF, by the European Neutron Scattering Association (ENSA). It provides a comprehensive overview of the present status of the neutron scattering community and the neutron source installations in operation in Europe, and was compiled as a follow-up activity to an earlier ESF-coordinated study on the scientific prospects for neutron scattering with present and future sources (ESF-Autrans Report, 1996).

ISBN 2-912049-00-8, August 1998

A twenty years forward look at neutron scattering facilites in the OECD countries and Russia

Technical Report by D. Richter and T. Springer

Comprehensive report on the projected supply of research neutrons in the OECD countries and Russia. This study, carried out by two eminent scientists - Professors Dieter Richter and Tasso Springer - was commisssioned by the Megascience Forum's Neutron Sources Working Group. At various stages of the work, the authors benefitted from interaction with ongoing studies being carried out under the aegis of the European Science Foundation and, therefore, the report is being published jointly by the Megascience Forum and the Foundation.

ISBN 2-912049-03-2, November 1998

Investigation of local inhomogeneities in high-T_c superconductors using neutron scattering

Matthias Gutmann
Laboratory for Neutron Scattering ETH Zurich & PSI
CH-5232 Villigen PSI

The work presented in this thesis concentrates on the high-T_c superconductors of the $Nd_{2-x}Ce_xCuO_4$ and $RBa_2Cu_3O_y$ (R=rare earth) family. Structural, electronic and magnetic properties are investigated using different experimental techniques. The main technique used in this work is neutron scattering both elastic and inelastic. Other techniques include conventional X-ray diffraction, EXAFS (Extended X-ray Absorption Fine Structure), XANES (X-ray Absorption Near Edge Structure), magnetic susceptibility and specific heat measurements. The goal of this work is the investigation of local properties in the aforementioned compounds. These properties are partly compared with the macroscopic properties. Furthermore the results should help to provide further restrictions to models for superconductivity.

The second chapter deals with the theoretical basis which is necessary to understand the principles of several experimental techniques. These include diffraction, crystal-field spectroscopy, EXAFS and XANES. Additionally the different types of instruments used in the neutron and X-ray absorption studies are shortly presented. The sol-gel method, which was successfully applied for the synthesis of most of the compounds is described.

The electron-doped high-T_c compounds $Nd_{2-x-y}Ce_xLa_yCuO_{4-\delta}$ ($0\leq x\leq 0.2$, y=0.5, 1) are studied both as a function of Ce-doping x and oxygen deficiency δ in chapter three. These two parameters mainly control the charge carrier density in the CuO_2-planes. After a short introduction, the results of neutron diffraction are presented. The local structure around the Cu ions is investigated using EXAFS. The CuO_2-planes remain flat at all doping levels. Comparing a superconducting and non-superconducting sample from the same batch as a function of temperature indicates a minimum in the EXAFS-Debye-Waller factor for the superconducting sample at T_c. This finding may indicate a local structural phase transition at T_c. Some insight in the connection between superconductivity and carrier doping is gained from neutron crystal-field spectroscopy and XANES experiments. These two techniques are highly complementary local probes of the charge distribution. Clearly electronic inhomogeneities are evidenced. From both methods a linear relation between Ce-doping and Cu^+-content is derived. Using crystal-field spectroscopy coexisting electronic regions with doped and undoped character are observed. Moreover, the extracted volume fractions as a function of Ce doping show a clear correlation with the threshold Ce doping for the onset of superconductivity. The XANES and susceptibility measurements on samples with a fixed Ce- and variable oxygen content show striking similarities between T_c, Meissner fraction and carrier doping.

The effects of quenching $ErBa_2Cu_3O_y$ ($6\leq y\leq 7$) into liquid nitrogen after high temperature annealing are studied in chapter four. The structural parameters and T_c show a relaxation behavior at room temperature similar to $YBa_2Cu_3O_y$. The crystal-field spectra of quenched and fully relaxed (same) samples are compared. The relaxation behavior of T_c as a function of annealing time at room-temperature is observed in a sample which was not superconducting after quenching and relaxed to a final value of 17 K. The relaxation constant is obtained and the mean free path for chain oxygen is estimated.

Dimer excitations of Nd in $Nd_{0.06}Y_{0.94}Ba_2Cu_3O_{6+x}$ (x=0.88, 0.94) are the subject of chapter five. From specific heat experiments an increasing anisotropy of the exchange couplings between Nd^{3+}-ions with decreasing oxygen content is observed within the (*a*, *b*) plane. The results are qualitatively discussed using the 2D-Ising model and Monte-Carlo simulations on a 20x20 Nd-Cluster.

The linewidth of the quasielastic line of Tb^{3+} in $Y_{0.9}Tb_{0.1}Ba_2Cu_3O_7$ is studied as a function of temperature in chapter six. No anomalies are found neither at T_c nor above. Instead an exponential increase of the line width as a function of temperature is observed indicating that phonons are involved in the relaxation process.

Status of the Single Crystal Diffraction Instrument TriCS

J. Schefer[a], P. Keller[a] and N. Schlumpf[b]

[a] for the LNS-team, [b] for the electronics-team, CH-5232 Villigen PSI, Switzerland

Jurg.Schefer@PSI.CH

http://www1.psi.ch/www_sinq_hn/SINQ/instr/Trics.html

The single crystal diffractometer TriCS at R42 is presently completed. The instrument was delayed due to detector problems similar to D20 and a delay in the cabling due to a lack of manpower in the electronics department. A two-dimensional wire detector is presently assembled at EMBL and will be delivered mid January 1999. The monochromator has been successfully tested at TOPSI/SINQ.

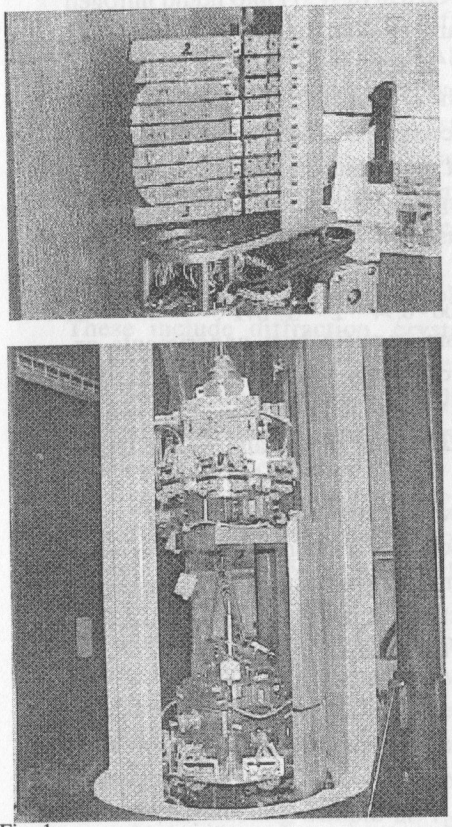


Fig. 1:
Monochromator mechanics prior to installation in the shielding. Upper position: C_{002}, lower position: Ge_{311} (picture on top).

First flux measurements with the high resolution Ge_{311}-monochromator using Au-foils yielded $5.7 \cdot 10^5$ n/cm^2/s/mA by focusing the beam to a height of 40mm. For flux comparisons: DMC at Saphir/ Ge_{311}/λ=1.7Å: $5 \cdot 10^5$n/cm^2/s, DMC at SINQ/ C_{002}/λ=2.56Å: $5.3 \cdot 10^5$ n/cm^2/s. After this first successful test of the monochromator, we attempted to reduce the focus and therefore used the new TOPSI spectrometer for a final and perfect alignment of the individual slabs, both for TriCS and HRPT. The results of these tests are shown in Fig. 2. New flux measurement are scheduled for mid December 1998 after the local beam access system (LBC/LAC) is installed, especially to test the maximal focusing conditions.

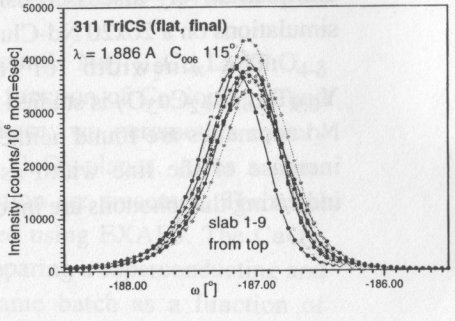


Fig. 2:
Rocking curve of the nine Ge_{311}-slabs measured at TOPSI/ SINQ using a C_{006}-monochromator.

We also installed a second C_{002} monochromator with fixed focusing and a limited height of 50mm for measurements of magnetic Bragg peaks with higher flux but lower resolution. The interesting q-range for these measurements will be well covered with this set-up.

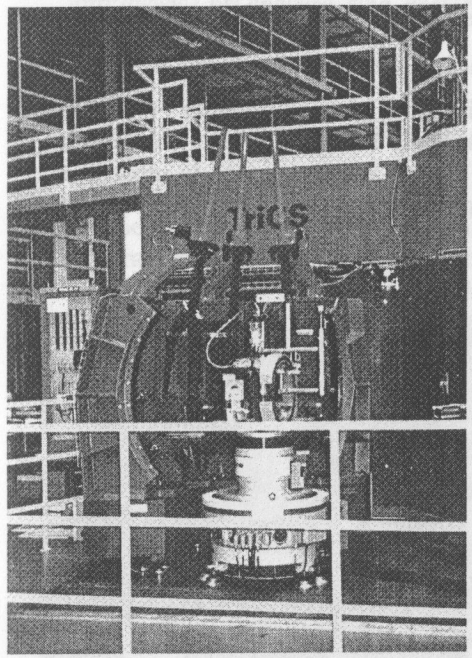


Fig 3:
Helium flow cryostat (1.5-300K) for full 4-circle operation mode installed on TriCS. The cold test is pending.

Two main problems caused a delay of the start-up: The microstrip detectors could not be completed within time as major problems have to be solved (c.f. D20). As we do not have presently sufficient manpower at PSI, we will wait for the results at ILL.
We therefore decided to run first with a wire chamber detector from EMBL. A first detector is presently assembled at Grenoble and will arrive in January 1999. Depending on the experience we will order the other two within 1999.

The equipment for temperature control has been completed with a four-circle cryostat (1.5-300K), which is available with a three months prior notice in order to complete all the test and to order the helium dewar. Standard equipment will cover 12 to 450K in 4-circle mode. Any other equipment is available in out-of-plane measurements (tilting mode), of course with a certain loss in resolution.

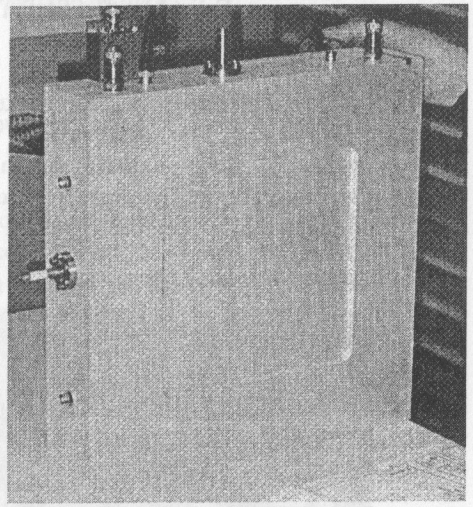


Fig. 4:
EMBL wire chamber detector with 20 cm by 20 cm active area and delay readout.
Picture taken Nov. 10, 98 at Grenoble.

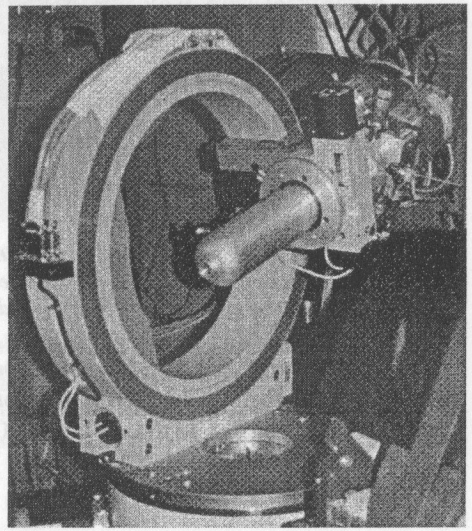


Fig 5:
APD (12-450K) for full 4-circle operation mode.

FOCUSsing on taking data

Felix Altorfer, Stefan Janssen and Lothar Holitzner

PSI and University of Saarbrücken time-of-flight spectrometer FOCUS at SINQ is expected to serve as a work horse for inelastic and quasielastic neutron scattering experiments in the future. We are pleased to report that the integration of all hardware components of FOCUS was successfully completed by December 18, 1998.

Overview of major hardware components of FOCUS. From left to right: Ar-filled flight chamber containing 400 ^{3}He-filled detectors. Then the sample chamber, Fermi-chopper, monochromator shielding, focusing guide and lead filled biological shielding.

All the hard work paid off on December 22, when we measured the first spectrum of a vanadium sample on FOCUS (see title page). It was obtained just in time before the annual SINQ shutdown. FOCUS will be operational at SINQ start up in March 99.

If you like to check on the latest concerning FOCUS and instrument specifications, please have a look at our web page:
http://www1.psi.ch/www_sinq_hn/SINQ/instr/Focus.html .

The 1998 activities covered a wide range:

- All 150 ^{3}He detectors of the central row are in place and ready for taking data.
- The doubly focussing monochromator that consists of 63 PG crystals arranged in an array of 9 rows and 7 columns has been installed. Each of the sixty-three PG crystals has been aligned on the SINQ instrument TOPSI.
- The flight chamber of FOCUS, where scattered neutrons pass a 2.5 m distance, has been flooded with the fill gas Ar. We found that the oxygen content in the chamber decreased to 0.1 %, in other words the flight chamber is filled with a mixture of 99.5 % Ar and 0.5 % air. The chamber itself is airtight.
- Auxiliary equipment such as the cold Be-Filter, the converging guide (equipped with supermirrors) and the shutter are ready for operation.
- Both choppers have been installed and tested in their final position, a heavy (30 cm thick) biological lead shielding around the disk chopper has been mounted.
- In a concentrated effort the cabling (all the motors, all data cables etc.) and plumbing (vacuum and exhaust pipes) of the instrument has been completed.
- FOCUS has now a dedicated closed cycle refrigerator (15 K – 475 K) and ILL-type 70 mm cryostat.

We would like to thank to all people involved at PSI and ETHZ who helped to reach the current status so quickly. Highest priority during the shutdown will be the debugging of FOCUS electronics and software to make sure that future researchers will enjoy a reliable and user friendly spectrometer. We are looking forward to serving the neutron community in 99.

STATUS OF THE HIGH-RESOLUTION POWDER DIFFRACTOMETER HRPT FOR THERMAL NEUTRONS AT SINQ

P. Fischer and M. Koch, LNS, ETHZ & PSI; N. Schlumpf, PSI, 5232 Villigen PSI

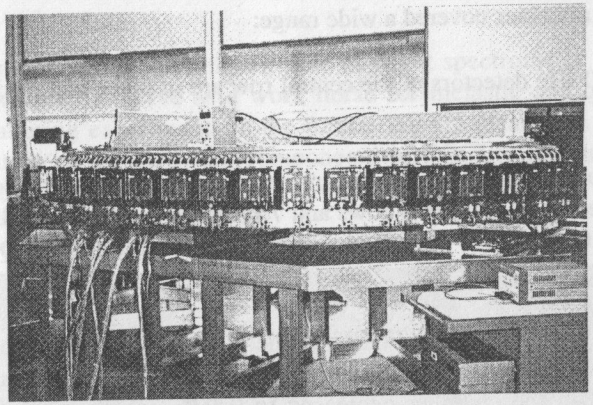


Fig. 1: HRPT detector LCP1600 with electronics at Cerca, Romans, 18.11.1998.

In Nos. 11 and 12 of Swiss Neutron News the principle and first components of the instrument were described. In the meantime the "heart" of HRPT, the position-sensitive ^{3}He detector LCP1600 corresponding to 1600 detectors in a scattering angle range of 160° (Fig. 1), has been finished successfully at Cerca, Romans, France. The corresponding new electronics has been developped by E. Berruyer, Cerca, in collaboration with N. Schlumpf, PSI. The detector will soon be transported to SINQ. In case of no transport damage the final counter gas composition will be inserted there by Cerca. Then the detector and the electronics will be adjusted and tested by means of an Am-Be neutron source on the detector bank (Fig. 2) and later by monochromatic neutrons from the Ge monochromator of HRPT. A major problem to solve is a suitable cooling (≈ 1 kW) and temperature safety system for the detector surrounded by the detector shielding, avoiding disturbing vibrations. Further essential electronic parts still in development at PSI are the detector interphase and the histogram memory. Despite manpower shortage we hope that HRPT will start test operation in March 1999. However also then further mechanical parts such as optimization of the monochromatic beam shielding including an optional C filter, the fabrication of a "V" sample chamber and the procurement as well as installation of a cooling machine will be needed.

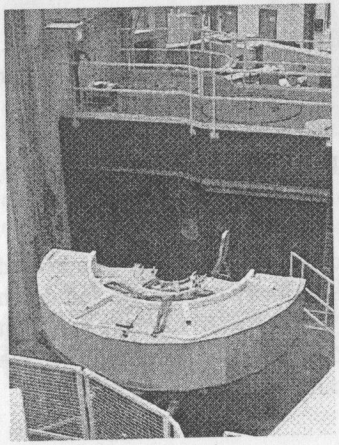


Fig. 2: Detector shielding of HRPT at SINQ target station.

Konferenzen 1999/2000

Datum	Ort	Thema
18.1.98	Bern	In-Situ Surface Diffraction (Synchrotron Radiation Information Day) sybille.neuhaus@psi.ch
21.2.-1.4.99	Grenoble	HERCULES: Neutron and Synchrotron Radiation for - Physics and Chemistry of Condensed Matter - Biomolecular Structure and Dynamics http://www.polycnrs-gre.fr/hercules
25.-26.2.99	Bern	Annual Meeting of the Swiss Physical Society http://www.sps.ch/sps/
20.-26.3.99	Atlanta	APS Centennial Meeting http://www.aps.org/centennial
22.-26.3.99	Münster	DPG Frühjahrstagung, Arbeitskreis Festkörperphysik http://www.dpg-physik.de
17.-20.5.99	Upton	11*th* International Conference on Small-Angle Scattering http://sas99.bnl.gov/sas99
10.-15.7.99	Argonne	22*nd* Rare Earth Research Conference http://chemistry.anl.gov/rerc
28.7.-2.8.99	Stockholm	Int. Conf. on Physics and Chemistry of molecular and oxide superconductors (MOS99) mos99@physics.kth.se
7.-13.8.99	Zuoz	7*th* Summer School on Neutron Scattering renate.bercher@psi.ch
30.8.-3.9.99	Les Diablerets	8*th* International Conference on Muon Spin Rotation, Relaxation & Resonance solt@psi.ch
1.-4.9.99	Budapest	2*nd* European Conference on Neutron Scattering (ECNS'99) ecns99@sunserv.kfki.hu
5.-7.9.99	Schwäbisch Gmünd	Int. Conf. on Solid State Spectroscopy (ICSSS) http://cardix.mpi-stuttgart.mpg.de/icsss/
6.-10.9.99	London	EPS-11: Trends in Physics http://www.iop.org/IOP/Confs/EPS
29.9.-2.10.99	Dubna	NSHP-II: Neutron Scattering at High Pressure denk@nf.jinr.ru
13.-17.3.00	Montreux	18*th* General Conference of the Condensed Matter Division of the European Physical Society rsl@zurich.ibm.com

Generalversammlung 27. Nov. 1998

PSI, Villigen, Auditorium (WHGA/001), 15.45 Uhr

PROTOKOLL

1. Begrüssung

K. Yvon, der Präsident der SGN begrüsst die 36 Anwesenden zur Generalversammlung 1998 der Schweizerischen Gesellschaft für Neutronenstreuung.

2. Protokoll der GV vom 21.11.1997

Das Protokoll der GV vom 21.11.1997 (siehe Swiss Neutron News Nr. 12) wird genehmigt und verdankt.

3. Jahresbericht des Präsidenten

Im Jahresbericht orientiert der Präsident über die verschiedenen Aktivitäten der SGN seit der letzten Generalversammlung.

- An der Jahresversammlung der Schweizerischen Physikalischen Gesellschaft am 26./27. Feb. in Bern wurden 15 mündliche Vorträge und 13 Poster über die Neutronenstreuung und die SINQ präsentiert.
- An seiner ersten Sitzung am 10. Sept. 1998 hat sich der Vorstand neu konstituiert.
- Das BBW erwägt den Vertrag mit dem ILL zu erneuern. Der vorgesehene Beitrag der Schweiz beträgt 3.5%.
- Der Präsident lädt die Mitglieder ein, neben der SINQ weiterhin Gebrauch von der Hochflussneutronenquelle am ILL zu machen.
- Die Zahl der Mitglieder hat um 28 auf 192 zugenommen. Der Mitgliederbeitrag von Fr. 10 dürfte rekordverdächtig tief sein.

4. Jahresrechnung des Kassiers

Vermögen 1.1.1997 1372.55

	Einnahmen SFr	Ausgaben SFr
Mitgliederbeiträge (Kasse)	400.00	
Mitlgiederbeiträge (PC)	760.00	
Beitrag Sommerschule Zuoz		487.50
Taxen für Postcheck		33.50
Nettozins	5.20	
Total	1165.20	521.00
Einnahmen 1997		644.20

5. Bericht der Revisoren

Die Rechnungsrevisoren haben die Belege, die Abrechnung und die Bilanz für das Jahr 1997 überprüft und für in Ordnung befunden. Sie schlagen den Anwesenden die Annahme der Jahresrechnung und die Entlastung des Vorstands vor. Die Anträge werden einstimmig genehmigt.

6. Budget für das Jahr 1999

	Einnahmen SFr	Ausgaben SFr
Mitgliederbeiträge	1400.-	
Sommerschule Zuoz		600.–
Diverses		100.–
Taxen für Postcheck		35.–
Zins	10.–	
Verrechnungssteuer		3.–
Total	1410.–	738.–
Einnahmen 1999		672.–

Das Budget 1999 wird von den Anwesenden einstimmig genehmigt.

7. Bericht des Repräsentanten der SGN/SSDN an der ENSA

A. Furrer, der Vorsitzende der European Neutron Scattering Association (ENSA) entbietet die Grüsse der europäischen Dachorganisation der nationalen Neutronenstreugesellschaften. Die ENSA umfasst heute 15 nationale Gesellschaften und Komitees als Vollmitglieder. Den Status als Beobachter haben zwei weitere Länder, die Vertreter der grösseren europäischen Neutronenquellen und

Neutronenquellenprojekte sowie Vertreter von Organisationen, wie z.B. die European Science Foundation (ESF). Seit der Gründung im Jahre 1994 hat die ENSA viele Aktivitäten entwickelt:

- Survey of the neutron scattering community and facilities in Europe (publiziert durch die ESF)
- Scientific prospects for neutron scattering with present and future sources (der "Autrans Report" publiziert durch die ESF)
- Organsisation von Konferenzen über Neutronenstreuung:
  - ECNS'96 in Interlaken
  - ECNS'99 in Budapest
  - ICNS 2001 in München
- ENSA technology co-operation initiative (instrumentation and method development)
- ENSA statements (e.g. ESS project)

Die ENSA hat sich in kurzer Zeit zu einer viel respektierten Organisation entwickelt, ohne die auf dem Gebiet der Neutronenstreuung in Europa nichts mehr "geht". Interessenten werden auf die ENSA web pages (www.psi.ch/ensa) verwiesen.

Diskussion:

Fragen von W. Fischer:

- Warum wird die SINQ im Vorwort des "Survey of the Neutron Scattering Community and Facilities in Europe" nicht erwähnt?
- Warum ist SINQ keine "major neutron source"?

Antwort von A. Furrer: SINQ ist keine grosse Quelle.

8. Subkomitee des wissenschaftlichen Rates des ILL

In die Subkomitees des ILL werden als neue Mitglieder gewählt und dem BBW vorgeschlagen:

- Collège 4: P. Allenspach
- Collège 5a: M. Kunz
- Collège 7: B. Schönfeld
- Collège 9: J. Ricka

9. Aktivitäten im Jahre 1999

- 1999 ist keine eigene wissenschaftliche Tagung geplant

- 15. April: Deadline für SINQ Proposals
- 7.-13. August: Sommerschule in Zuoz
- 1.-4. September: ECNS'99 in Budapest
- Frühjahr 2000: Gemeinsame Tagung mit der Schweizerischen Gesellschaft für Kristallographie SGK.
- Jahr 2005: Unterstützung des internationalen Kristallographiekongresses in der Schweiz.

10. Varia

P. Böni orientiert über Neuerungen im Swiss Neutron News:

- Publikation von Zusammenfassungen von Dissertationen
- Veröffentlichung von offenen Stellen
- "Just published": Ankündigung von neuen Büchern über Neutronenstreuung

Informationen bitte an den Sekretär der SGN, P. Böni, einsenden. Sehr erwünscht sind natürlich auch weiterhin wissenschaftliche Beiträge.

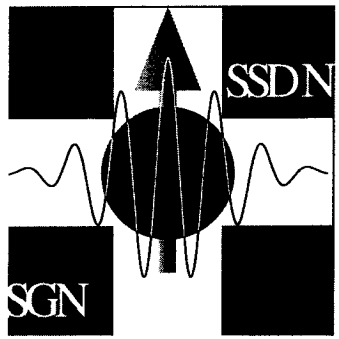
K. Yvon und P. Allenspach werden für die Kreation des gelungenen Logos für die SGN/SSDN eine Flasche Wein für weitere geistige Inspirationen überreicht.

Um 16.15 Uhr wird die Behandlung der Traktanden abgeschlossen.

Der Sekretär der SGN, Dr. P. Böni

Unser neues LOGO:

Idee: K. Yvon
Realisierung: P. Allenspach



Neue Mitglieder

P. Böni

Die Zahl der neuen Mitglieder nimmt weiter zu und nähert sich 200. Wir begrüssen:

- A. Züttel, Universität Fribourg
- C. Carlile, Rutherford Laboratory
- Schweizerische Landesbibliothek Bern
- M. Balasoiu, Frank Laboratory for Neutron Physics, JINR, Dubna
- O. Fritz, Paul Scherrer Institut, Villigen PSI
- M. Kompatscher, ETH Zürich, Zürich

Zur Zeit zählt die schweizerische Gesellschaft für Neutronenstreuung 192 Mitglieder.

The SGN is now on the Web!

our adress:

http://www.psi.ch/sgn

SINQ

Swiss Spallation Neutron Source
Paul Scherrer Institute

Paul Scherrer Institute (PSI)
SINQ Scientific Coordination Office
WHGA/147, CH-5232 Villigen PSI, Switzerland
Phone: +41 56 310 2087, Fax: +41 56 310 2939
Email: SINQ@psi.ch, Web: www.psi.ch/sinq

EXPERIMENT REQUEST

Proposal number

[ ] **Short term proposal (next allocation period)** [ ] **Long term proposal (2 years)**

Proposer *(to whom correspondence will be addressed)*
Name and first name:
Address:
Phone:
Fax:
Email:

Co-proposer:
Name: Address: *(if different from above)* Phone/Fax/Email:

Sample description

Substance and formula:

Mass: Size:

[ ] Polycrystalline [ ] Single crystal [ ] Multilayer [ ] Liquid [ ] Gas

Sample Container: Space group: Unit cell: a= b= c=

Hazard

Is there any danger associated with the sample or sample environment?
[ ] No [ ] Yes [ ] Uncertain If yes or uncertain, please give details of the risks associated:

Experimental details

Instrument	**Days**	**Sample cond.:** Temp., Pressure, Magn. field	**Exp. cond.:** E, ΔE, λ, Δλ, Q, ΔQ

Requested dates:	**Unacceptable dates:**

Title of Experiment:

Research funded by:

Scientific background/Aim of experiment: *(Please restrict to the space given within this box!)*

I certify that the above details are complete and correct.
Date: Signature of proposer:

Schweizerische Gesellschaft für Neutronenstreuung (SGN)
Société Suisse pour la Diffusion des Neutrons (SSDN)

Anmeldeformular

Name:.....

Vorname:.....

Akad. Titel:.....

Geschäftsadresse:.....

.....

.....

Telefon:.....

Telefax:.....

Telex:.....

E-Mail:.....

Privatadresse:.....

.....

.....

Telefon:.....

Zustelladresse: Geschäft/Privat ? (Nichtzutreffendes streichen)

Datum: .....

Unterschrift: .....

Bitte senden an:

Sekretariat SGN, c/o Laboratorium für Neutronenstreuung, 5232 Villigen PSI

(Jahresbeitrag: Fr. 10.--)