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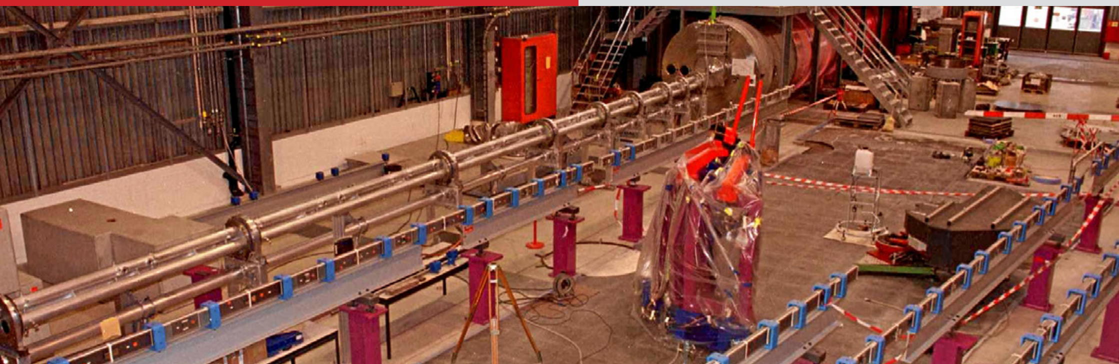
# SWISS NEUTRON NEWS




Schweizerische Gesellschaft für Neutronenstreuung
Société Suisse pour la Diffusion des Neutrons
Swiss Neutron Scattering Society

**On the cover**

View of the SINQ guide hall during construction in 1996 (top) and in 2016 (bottom).

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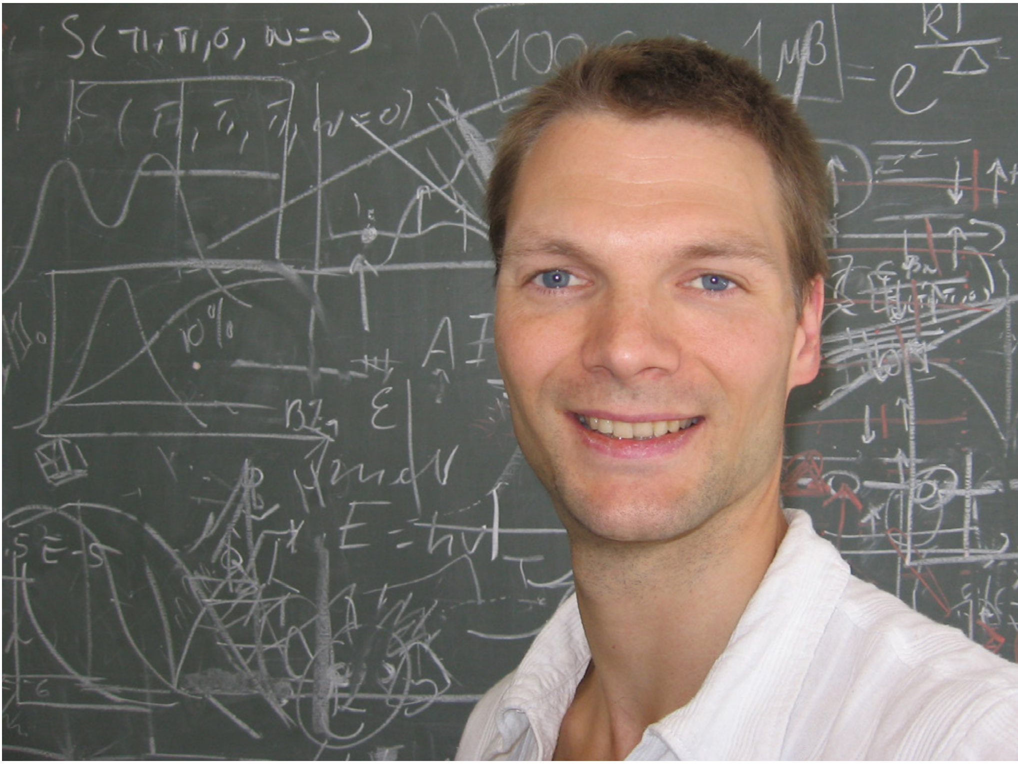

Dear Colleagues,

Welcome to this issue of neutron news. It is such an exciting time that I do not even know where to start: A big welcome to Christian Ruegg as new head of PSI's NUM division for Research with Neutrons and Muons, and in the same breath many grateful thanks to Kurt Clausen who retired from successfully commanding this important division for over a decade. You will find in this issue two inspiring tales of respectively the history of our successful national source SINQ by Albert Furrer, and of the stewardship leading to fruitful Swiss membership to ILL and ESS by Martin

Steinacher. This year SINQ is celebrating its 20 year anniversary – an event where I hope to meet and celebrate with many of you. The future is exciting too – for SINQ with an important guide upgrade in the works; for ILL where Switzerland will next year celebrate 30 years as scientific member; and for ESS – history in the making – where several of the instruments with Swiss participation just passed the so-called toll-gate-2 milestone. With a successful history and an exciting future, Swiss neutron science is vibrating as ever before!

Enjoy,
Henrik M. Ronnow

# The Swiss Spallation Neutron Source SINQ: From Idea to Realization

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* The author's involvement in the SINQ project was the responsibility for the user contacts as well as for the development of the instrumentation for neutron scattering experiments in the period 1977-2004. He represented SINQ in the working group on neutron research of the European Science Foundation (1980-1986), in the working group on neutron sources of the OECD Megascience Forum (1995-1998), and in the committee for neutron sources of the International Union of Pure and Applied Physics (1998-2000).

## Introductory Remarks

Switzerland has a long tradition in neutron scattering. Soon after the commissioning of the light-water reactor Saphir (1 MW thermal power) in the year 1957, Walter Hälg (professor at ETH Zurich) recognized the potential of neutron scattering for materials research. He started to build instruments at Saphir for neutron diffraction experiments. The situation was improved in the year 1960 with the commissioning of the heavy-water reactor Diorit (30 MW thermal power), which allowed to perform neutron spectroscopic experiments as well. 1977 marked the year of the final shutdown of Diorit. In the meantime, the reactor Saphir raised the thermal power up to 10 MW and the experimental hall was considerably enlarged, so that the neutron scattering activities could be successfully continued. At the end of the year 1993, however, the reactor Saphir had to be shut down, mainly for safety reasons. Was this the end of neutron scattering in Switzerland? The answer is no! The excellent conditions at both Diorit and Saphir created a strong national user community, which was able to exert a sufficiently strong pressure to maintain a permanent home base for neutron scattering experiments, and which was essential to get the green light for the construction of the spallation neutron source SINQ.

This report provides a chronological summary of the major steps in the development of SINQ. A short historical review is given in Ref. [1]. The initial sections describe how the project emerged from early ideas and technical concepts, which were repeatedly modified and finally led to the present SINQ. After the production of the first neutrons in the year 1996, the performance of SINQ has been permanently improved by upgrades and extensions as summarized in the final sections.

## The Booster Concept (1972-1977)

Ideas about a Swiss spallation neutron source emerged soon after the successful commissioning of the 590 MeV proton cyclotron at the Swiss Institute for Nuclear Research (SIN) at Villigen in the early seventies. The spallation process typically provides a thermal neutron flux of the order of $10^{14}$ n · cm$^{-2}$ · s$^{-1}$ · mA$^{-1}$. Initially the proton current of the cyclotron was restricted to 100 µA, resulting in a neutron flux below an acceptable level. Therefore Walter Hälg, Beat Sigg and coworkers considered the so-called booster option based on a spallation target containing fissile materials, which produces an enhanced neutron flux by at least an order of magnitude. The booster option can be considered as an undercritical reactor assembly which, however, poses major safety precautions accompanied by considerable financial consequences, so that the booster study was not continued further, also in view of the continuous increase of the cyclotron's proton current to 200 µA in the year 1978 and finally to 2 mA in the year 2000, which made the concept of a truly spallation-based neutron source highly attractive.

## The First SINQ Concept (1978-1982)

Spallation sources ideally operate with pulsed neutron beams triggered by pulsed proton beams, but the cyclotron at SIN provides a continuous proton beam due to the absence of a macro-timestructure. Therefore, the realization of a pulsed spallation source at SIN would have required to build an additional storage ring, but this option was soon given up mainly for financial reasons. Walter Fischer (see Fig. 1) and coworkers studied a new concept based on a continuous neutron beam. This concept was presented at a discussion meeting at Villigen on April 14, 1978, with more than 100 international participants. It was concluded that the realization of a continuous neutron source would be a most valuable extension of SIN's activities towards condensed-matter research, an opinion which was strongly supported by Sir William Mitchell and George Stirling (both were key persons to build the spallation neutron source ISIS in the United Kingdom). Moreover, such a neutron source would constitute an ideal parasitic use of the intense waste beam of the proton cyclotron which so far was directed - after having passed through some meson targets - to a beam dump without any further use. At the end of the meeting, Jean-Pierre Blaser (director of SIN) decided to initiate a detailed study of a continuous neutron source within a project group „SINQ" headed by Walter Fischer. SINQ is an acronym meaning „SIN-Quelle" in German („Quelle"=source) and „SIN-Queue" in French („Queue"=tail; the spallation target is positioned like a tail at the end of the proton beam).

Immediately after this meeting, an intense phase of international collaboration began.

**Figure 1**
The key persons of the SINQ project: Walter Fischer (left), Günter Bauer (middle), and Erich Steiner (right)

Together with experts from Jülich, Karlsruhe and Munich the installation of a mock-up target was planned in order to demonstrate experimentally the expected performance of SINQ. In addition, calorimetric measurements were performed at the accelerator in Vancouver to test the properties of both some target materials and the cold source under intense proton irradiation. All these efforts were essential for a high-risk project like SINQ to obtain a vigorous basis for the technical realization, to prove the physical parameters resulting from simulations, and to arrive at a reliable estimate of the project costs.

A budget of 32.58 MCHF was estimated for the SINQ project, and the ETH Board was approached for financial assistance. However, the ETH Board decided to first obtain expert opinions concerning the science policy associated with SINQ. The Swiss National Science Foundation (SNF) – based on a report of an international expert group – came to a positive recommendation in the year 1979. In particular, it was emphasized that the future scientific needs expressed by the Swiss user community would excellently be accommodated by a neutron source like SINQ. Based on the SNF report, the Swiss Science Council came to a similar conclusion in the year 1982 and recommended the realization of SINQ with high priority. Due to several circumstances, the Swiss Government included the SINQ budget in its financial planning only in the year 1986, which was approved by the National Parliament in spring 1987.

## The Final SINQ Concept (1983)

In the course of the pre-studies some difficulties with the original SINQ concept became apparent. (i) Squeezing the SINQ into the already crowded experimental hall caused severe room problems for the maintenance of the target station as well as for optimally placing the instruments. (ii) The installation of instruments around the SINQ target was restricted to the lateral sites only, since the section of the incoming proton beam as well as the backside section were not accessible for instruments. (iii) There was simply no room to accommodate a modern neutron guide system. All these problems were solved by a new concept approved by the SIN management. First, placing SINQ into the experimental hall was given up, i.e., new buildings for both the SINQ target and the neutron guide system were foreseen. Second, and most importantly, the concept of a horizontal target was abandoned. Instead, the neutron source was to consist of a vertical target into which the proton beam is shot from below, allowing a coverage by instruments in a full angular range of 360°.

The new SINQ concept was presented at the second international discussion meeting on March 14, 1983, which took place at the ETH Zurich and gathered more than 200 participants from universities, industrial companies, and science organizations. There was an almost unanimous agreement that the realization of SINQ should be pushed with high priority, also in view of the so-called „neutron gap" threatening the worldwide neutron scattering activities towards the end of the century according to an OECD study report [2]. The meeting was continued on March 15, 1983, at SIN Villigen, where prospective SINQ users presented their scientific cases, giving essential information on the type of instruments needed for the corresponding neutron scattering experiments.

## The Scientific Prospects of SINQ

Due to the provision of continuous neutron beams, the utilization of SINQ is very similar to that of a nuclear reactor. The thermal neutrons have a flux comparable to a medium-flux reactor. However, the big advantage of SINQ over a reactor is that, because it produces less gamma radiation per neutron, a cold neutron moderator is heated less. The cold source can therefore be installed at the position of the highest neutron flux. Cold neutrons can be transported by a neutron guide system – for the first time tailored to the needs of every instrument - over large distances essentially without loss, and a considerable reduction of unwanted background in the measurements is achieved. The combination of both the cold source and the neutron guides make SINQ competitive on an international level. This aspect was an essential criterion for the realization of SINQ, since cold neutrons became increasingly important to meet the scientific requirements of the national user community.

## The Pre-Construction Time (1984-1987)

The new SINQ concept posed a myriad of additional technical questions which had to be worked out in detail. One of the most important activities was the verification of the neutron flux expected for SINQ with use of a mock-up target which was installed in baracks outside the experimental hall close to today's medicine pavilion. A schematic layout of the mock-up target is shown in Fig 2. The experiments were carried out in the year 1984 with a reduced proton current in order to keep the size of the biological shielding small. The neutron fluxes measured for several moderator geometries and even for a cold $H_2$ moderator confirmed the flux numbers resulting from simulations. In the late eighties,

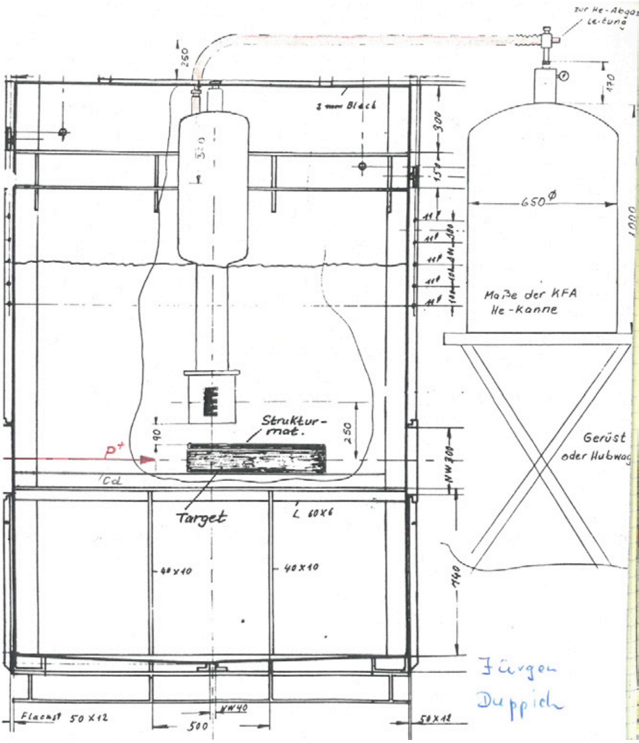


**Figure 2**
Schematic layout of the mock-up experiment (taken from Jürgen Duppich's laboratory notes).

Günter Bauer (see Fig. 1), the former technical director of the German SNQ project, joined the SINQ project group which profitted from his great experience with spallation sources. The number of people involved in the SINQ project continuously increased, so that the SINQ project group was later upgraded to a SINQ division headed by Günter Bauer. Also the prospective SINQ users met annually to update the requirements for the neutron scattering instruments. These meetings finally led to the creation of the Swiss Society for Neutron Scattering in the year 1992. Of course, all these detailed studies of the new SINQ concept had an impact on the total budget which was raised to 51.34 MCHF because of inflation, increased safety measures, and technological progress. In the year 1990, the additional funding of 18.76 MCHF was approved by the National Parliament.

Finally, the major parameters were frozen to enable the construction of SINQ. As schematically shown in Fig. 3, the target block and the plant service building are located in the target hall which has a floor area of 35×50 m$^2$. The accessible space around the target block is reserved for instruments using thermal neutrons. A set of seven neutron guides, running through a heavily shielded cavern in the ground floor of the service building, transport cold neutrons into the neutron guide hall, which measures 25×50 m$^2$ and is exclusively

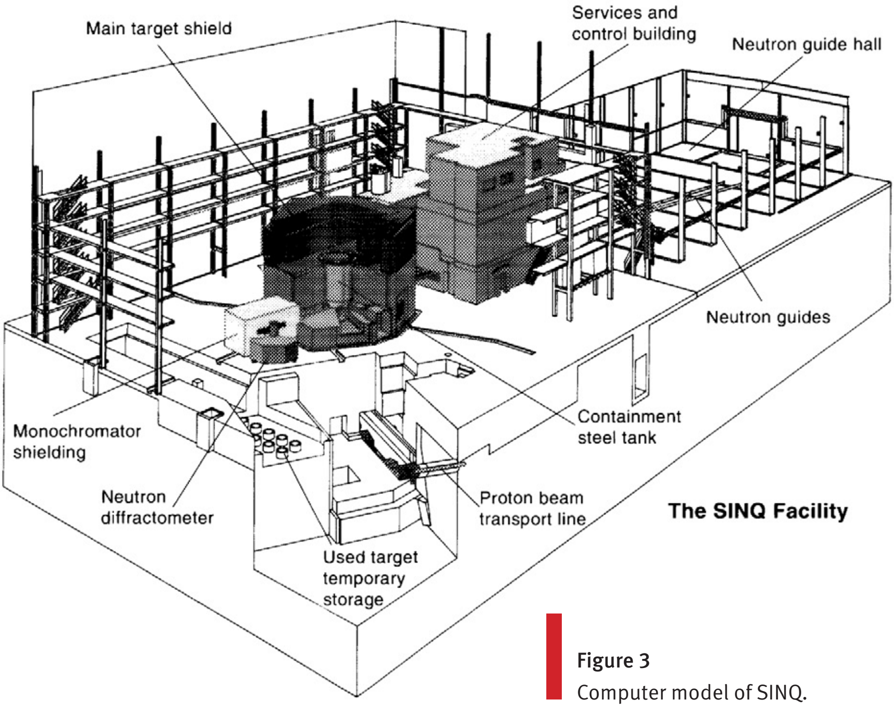


**Figure 3**
Computer model of SINQ.

reserved for neutron instruments and their ancillary equipment.

## The Construction Phase (1988-1996)

On August 8, 1988, the construction of the buildings for SINQ started. In the very same year the Paul Scherrer Institute (PSI) was founded as a merger of the SIN at Villigen and the Federal Institute for Reactor Research (EIR) at Würenlingen. The SINQ was considered as a lighthouse project to bundle up some of the activities within the new organization. The PSI management appointed Erich Steiner (see Fig. 1) as project leader for the construction of SINQ. In the year 1990 the tunnel between the meson target E in the experimental hall and the SINQ was built in order to host the proton beamline over a distance of 54 m. Before entering into the spallation target, the proton beam is forced through a collimator system to prevent any focus on the target window. Successively, the construction of all the SINQ components was launched with the aim to complete the facility typically in the year 1993 (coincident with the final shut-down of the Saphir reactor). As an example, Fig. 4 shows the SINQ target block during construction.

The very ambitious time schedule, however, underwent some delays due to the technological complexity of the project. A particular challenge was the construction of the innermost target container which is a double-wall aluminum tank with 2 m diameter. It

**Figure 4**
The SINQ target block during construction.

contains the $D_2O$ which is circulated for heat removal, and which is used to moderate the neutrons. It was quite hard to find an industrial company which dared to produce this item with the requested precision. Nevertheless, the $D_2O$ tank was delivered and perfectly introduced into the target shielding, thereby relieving a major pressure from the project responsibles. Another challenge was the optimization of the target itself. Lead and bismuth are in this respect promising materials. Since they have relatively low melting points, it was even conceivable to use them in liquid form, which allows heat removal by circulation of the target material. However, the implementation of a liquid target requires considerable development. In order to avoid time pressure at the current project stage, it was decided to go for a solid target consisting of zircaloy rods, which – even though it is not optimal from the neutronic point of view - is not expected to present significant operational problems. Finally, the construction of the SINQ target station was successfully completed towards the end of the year 1996.

## Education of the User Community

In order to make the international user community fit for future experiments at SINQ, annual summer schools were organized from 1993-2000 at the Lyceum Alpinum in Zuoz, nicely embedded in the beautiful Engadin Valley. Every school was attended by typically 100 participants (mainly Ph.D and postdoctoral students) who greatly profitted from the lectures and exercises presented by renowned scientists (e.g., by the Nobel Laureate Alex Müller in 1995). As a result, about two thirds of the participants became regular users of SINQ. A highlight of the first European Conference on Neutron Scattering held at Interlaken on October 8-11, 1996 (with a record attendence of more than 700 participants) was a one-day excursion to SINQ as part of the activities to attract prospective users, and several conference presentations were dedicated to SINQ [3].

## The First Neutrons from SINQ (1996)

On December 3, 1996, the SINQ was taken into operation and produced its first neutrons. After a test of the beam elements, a proton current of 20 µA was successfully kept on the target for about 10 hours. On the next day, the proton current was stepwise raised up to 900 µA. Some of the results of these tests are shown in Fig. 5. Of particular importance is the fact that the measured flux spectrum is significantly higher than calculated, especially for wavelengths larger than 4 Å. This demonstrates that for cold neutrons SINQ is competitive with the world-leading neutron sources, keeping in mind that the neutron flux of SINQ will be considerably enhanced in future both by neutronically improved targets and by a substantial increase of the proton current.

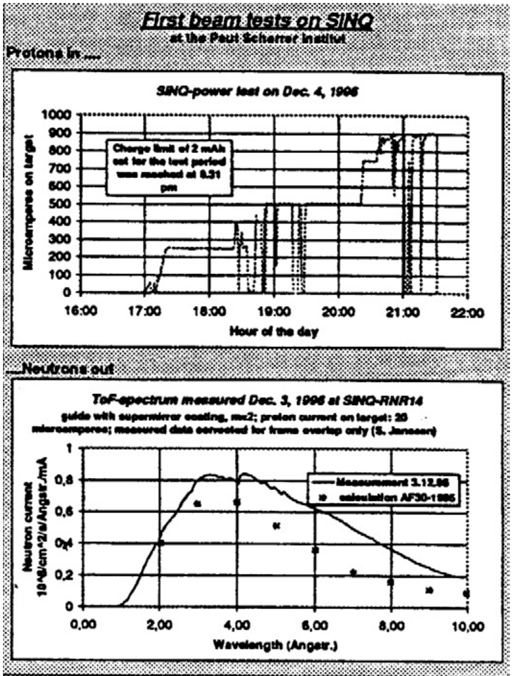


**Figure 5**
Results of the first beam tests at SINQ. The upper part shows the proton current on the SINQ target. The lower part displays the measured neutron spectrum taken at the guide RNR14 (solid line) in comparison with the estimated values (squares).

## Inauguration of SINQ (1997)

The official inauguration of SINQ took place on January 17, 1997. During this event, Meinrad Eberle (director of PSI) expressed his satisfaction about the successful outcome of the SINQ project, which was achieved thanks to the exemplary efforts of PSI experts in a truly interdisciplinary collaboration. The Federal Councillor Ruth Dreifuss (see Fig. 6) and other speakers put emphasis on the significance of SINQ to strengthen both the Swiss and the European research areas in broad fields of science. Finally, Joël Mesot (see Fig. 6), representing the generation of young scientists, pointed out the role of SINQ as an important facility to contribute to a successful scientific career, a vision which became reality for himself, since he has been director of PSI since the year 2008.

**Figure 6**
The Federal Councillor Ruth Dreifuss (left) inaugurates the SINQ. Joël Mesot (right) presents the young scientists' case during the inauguration ceremony.

## The Real Costs of SINQ

The budget of 51.34 MCHF allocated by the Swiss Parliament was by far too low to realize a technically challenging project like SINQ, so that additional funding was necessary, and several activities had to be economized in order to relieve the budget. A typical example for the latter aspect is the neutron guide system which was offered by an industrial company at a price of approximately 8 MCHF. The most expensive part of a neutron guide is the supermirror coating of the glass channels. It was therefore decided to perform the coating at PSI, which was a considerable technological challenge, since the proper techniques for supermirror coatings were not yet established at that time. Nevertheless, Peter Böni and coworkers developed this technique shortly after the purchase of a dedicated sputtering plant to perfection. From this highly successful endeaver the spin-off company SwissNeutronics arose in the year 1999.

The PSI invested more than 80 MCHF out of its yearly budgets mainly for internal manpower and for the experimental infrastructure including the first generation of neutron scattering instruments. In addition, the $D_2O$ necessary for the moderator (14 MCHF) was readily available at PSI as a result of the decommissioning of the reactor Diorit. For the biological shielding of the target station dozens of tons of iron (10 MCHF) were taken from the Swiss war reserve stored at the PSI campus. In total, the real costs of SINQ amounted to typically 160 MCHF.

## Commissioning of the First Generation of Instruments (1997)

In order to define the first generation of instruments, a user meeting took place on March 24-25, 1992, at PSI which was attended by more than 100 participants. In turn an international expert group chaired by Tasso Springer (director at FZ Jülich and former director of the ILL) recommended the presented instrument concept for realization, which included two powder diffractometers (DMC and HRPT), a single-crystal diffractometer (TriCS), a small-angle scattering instrument (SANS), a multi-purpose instrument (TOPSI, which includes a USANS option), a reflectometer (AMOR), two three-axes spectrometers (DrüchaL and TASP, the latter for polarized neutrons), and a high-resolution time-of-flight spectrometer (FOCUS). In addition to this programme, the SINQ division was preparing a neutron radiography station (NEUTRA) and a diffractometer for residual stress measurements (POLDI). Since no financial contributions were foreseen within the official SINQ budget, the necessary funding came to a large extent from the annual PSI budgets, but significant financial support was also obtained from external organizations (notably from the University of Saarbrücken for FOCUS through a grant provided by the German government). Furthermore, the ancillary equipment for sample preparation and sample environment as well as some instrument components were already available from the former activities at the reactor Saphir, which contributed to a major relief of the financial pressure.

In the second half of the year 1997, SINQ was operating typically for two days/week and allowed the successful commissioning of four instruments (DMC, DrüchaL, TASP, TOPSI) at the neutron guide system and one instrument (NEUTRA) at a thermal beam tube. The commissioning of the remaining instruments followed in the two following years.

## Start of Routine Operation (1998-1999)

The SINQ started its regular operational schedule with a proton current of about 1 mA by mid-1998. The first call for proposals launched in April 1998 received an unexpectedly large response. 136 proposals involving more than 200 scientists were submitted by national and international user groups, and the available beam time was already overbooked by a factor of 2.5. The novel category of „long-term proposals" was particularly advertized to allow the execution of coherent programmes in neutron scattering. This possibility was extremely well received by the users especially for the performance of long-term experiments in the framework of Ph.D studies. In the following years, the requests for beam time were gradually increasing due to the excellent conditions at SINQ, resulting in a doubling of external users already in the year 2000. The status of SINQ in the year 2000 was described in Ref. [4].

## Upgrades and Extensions of SINQ (2000-2006)

In the year 2000, the original zircaloy target was replaced by a target consisting of lead rods in zircaloy tubes, which was called „cannelloni target" (cannelloni is an Italien dish made from dough reels filled with minced meat). At the same time, the length of the meson target E was reduced from 6 cm to 4 cm, and the proton current was increased up to 2 mA. Some years later a new, geometrically improved cold $D_2$ source was installed, which doubled the flux at the cold neutron guides. All these measures resulted in an enhancement of the neutron flux by almost an order of magnitude, which was extremely beneficial for the users and allowed to perform novel classes of neutron scattering experiments at SINQ. In fact, an expert commission of the European Union funding the user programme 2001-2004 at SINQ made the following comments: „Recent scientific highlights resulting from experiments at SINQ are impressive in quality and range of topics covered.“ This was indeed a highly gratifying statement! Some highlights resulting from experiments at SINQ during the first five years of operation are summarized in Ref. [5].

In the year 2001, the Danish neutron scattering group moved its experimental facilities from Risö National Laboratory to SINQ. A second small-angle scattering instrument (SANS II) was installed, and DrüchaL's analyzer and detector parts were exchanged against the RITA system. Moreover, a major fraction of experimental devices (magnets, cryostats, dilution inserts, etc.) were moved to SINQ, which ideally complemented and improved the existing sample environment.

Soon after the commissioning of SINQ the limited space in the SINQ buildings caused severe problems for the technical operations as well as for the realization of the second generation of instruments. It was therefore decided to extend the neutron guide hall by an additional 22 m. In the year 2004, the extension of the guide hall was completed, which greatly improved the operations of the technical sections (sample environment, electronics, mechanics) and allowed the on-site sample conditioning as well as IT activities for the users. In addition, it hosted the new backscattering spectrometer (MARS) which became operational in the year 2007.

In the second half of the year 2006, test experiments were carried out with use of a liquid lead bismuth target in the framework of the European project MEGAPIE (**MEGA**watt **Pi**lot **E**xperiment) [6]. Such a target has been under active consideration for various concepts of accelerator driven systems (ADS) to be used in transmutation of nuclear waste and other applications worldwide. For SINQ it has the potential of increasing significantly the thermal neutron flux. The temporary insertion of a liquid metal target had major technical consequences, i.e., the containment as well as the cooling system existing for a solid target had to be considerably modified, and enhanced safety precautions had to be implemented. As expected, the measured increase of the thermal neutron flux turned out to be of a factor of 1.8. After these successful test experiments, the MEGAPIE target was removed in early 2007 and exchanged against the previously used cannelloni target mainly for safety reasons.

## The Consolidation Phase (2007-2016)

The last ten years have seen a very stable operation of SINQ without any major technical incidents. Most importantly, the reliability and availability of SINQ, relating to the delivered proton beam from the accelerator, has been routinely above 98%. This excellent figure of merit has been highly appreciated by the international user community which continuously increased up to about 900 visitors per year to carry out neutron scattering measurements. On the experimental side, the existing instruments for neutron scattering have been permanently improved and partly renamed (DrüchaL→RITA-II, TriCS→ZEBRA, TOPSI→MORPHEUS), and new instruments were installed (EIGER, a three-axis spectrometer for thermal neutrons; NARZISS, a polarized neutron reflectometer; ORION, a two-axis diffractometer for cold neutrons). In addition,

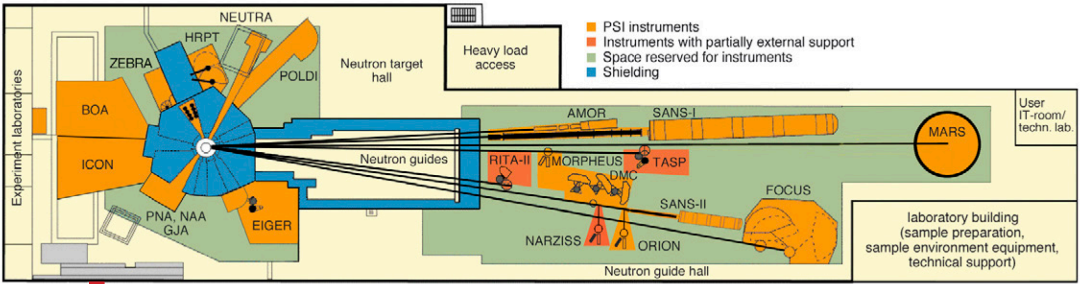


**Figure 7**
The present state of the SINQ instrumentation.

several beam lines were equipped with instruments for non-diffractive applications. An overview of the present state of the SINQ instrumentation is shown in Fig. 7.

## The Upgrade of the SINQ Guide System (2017-2020)

The aim of the symposium *20 years SINQ* held on April 18, 2017, at PSI was not only to look back at past achievements, but also to launch a neutron guide and instrument upgrade project in order to strengthen the performance of SINQ for the next 20 years. The completion of the upgrade programme is expected for the year 2020, and the overall costs are estimated to be 16.7 MCHF. The essential part of the upgrade concerns the neutron guide system which will be replaced by guides with tailor-made supermirror coatings according to the specific instrument needs, resulting in flux gains up to an order of magnitude. The international user community can therefore look into an extremely bright future of SINQ!

[1] A. Pritzker, in *The Swiss Institute for Nuclear Research SIN* (BoD, Norderstedt, 2014), p. 115 (ISBN 978-3-7386-0820-5).
[2] T. Riste, in *Neutron Beams and Synchrotron Radiation Sources* (OECD, Paris, 1994), p. 63 (ISBN 92-64-14249-5).
[3] See, e.g., W. Fischer, *SINQ – The spallation neutron source, a new research facility at PSI*, Physica **234-236**, 1202 (1997).
[4] P. Allenspach, *The Continuous Spallation Neutron Source SINQ*, Neutron News **11**, No. 3 (2000), p. 15.
[5] P. Fischer and A. Furrer, in *Swiss Neutron News No. 47* (March 2016), p. 6 (http://sgn.web.psi.ch/sgn/snn/snn_47.pdf).
[6] C. Fazio et al., *The MEGAPIE-Test Project*, Nuclear Engineering and Design **238**, 1471 (2008).

# Funding of Swiss Participation in International Neutron Scattering Facilities

**Martin Steinacher**

5 February 2017

## 1. Introduction

In the Swiss Neutron News 47 of March 2016, Peter Fischer and Albert Furrer (LNS/PSI) carefully described “Neutron Scattering in Switzerland in the 20th Century”. In their article, they focused on characteristic scientific and applied results being obtained with the use of Swiss instruments. In one of their conclusions they said: “This was made possible in Switzerland by a reasonably good level of funding”.

The SNSS President kindly asked me to look back 30 years on how such governmental support and funding was made possible for (1) the continuous Swiss partnership with the Institute Laue Langevin (ILL) in Grenoble since 1988 and (2) the Swiss participation in 2015 as a Founding Member of the European Spallation Source (ESS) being built in Lund.

## 2. Institute Laue Langevin (ILL) – the initial phase

The foundation of “Switzerland’s reasonably good level of funding” for the participation in international neutron scattering facilities was laid on 1 April 1987 when the Federal Council submitted a bill to the Parliament asking for a credit to fund membership in the European Synchrotron Radiation Facility (ESRF) and the Institute Laue Langevin (ILL), the then world-leading neutron scattering facility, both located in Grenoble.

In the early 80s, ILL – in operation since 1967 – was executing a comprehensive instrument renewal programme, which made a scientific partnership for Switzerland very attractive. It also offered above all a valuable complement and support in view of the national spallation neutron source SINQ, which was to be built at the Swiss Institute for Nuclear Research (SIN), which became part of the Paul Scherrer Institut (PSI) in 1988.

The aim of this bill was to support the Federal Government's research funding policy with regard to the promising international developments of neutron scattering and the synchrotron beam technologies. Since 1983, this objective was strongly supported by evaluations being carried out by the Swiss Science and Innovation Council, the Swiss National Science Foundation and a group of international experts (among them Nobel Prize winner Prof Mössbauer).

It was envisaged that the Federal Council would sign a contract with the ILL, establishing the desired scientific partnership between the ILL and Swiss researchers and scientists, which would henceforth be authorised to submit proposals for experiments like the scientists of the three ILL Associates (FR, DE and UK). This contract would also grant an observer seat in the Steering Committee, Scientific Council and to its subcommittees, responsible for the allocation of beam time. Swiss companies would be invited to participate in the tenders for ILL orders.

For the participation in the ILL, one assumed from a contractual agreement that Switzerland shall contribute at a rate of 1.5% of the ILL budget. The normal budget of the ILL amounted to 261 million FF in 1986. Assuming an entry into force of the relevant agreement on 1 January 1988, the funding commitment of Switzerland would amount to 6.4 MCHF over the 5-years period 1988-1992.

The bill to the Parliament concluded with statements by the Federal Council that it is in the aims of the federal research policy (1988-1991) to strengthen the international level scientific cooperation. Specifically, it promoted the interdisciplinary research, for which the planned and existing large instruments constitute an important basis. Thematically, it laid weight on new technologies in which the exploration of condensed matter takes a key position.

## 3. ILL – steady state participation

Following approval of the ESRF / ILL bill by the Parliament, Switzerland's scientific partnership with the ILL was concluded with an international treaty signed in 1988, which was extended by five years in 1993, 1998, 2004, 2008 and 2014. Switzerland is thus participating for a sixth five-year period (2014-2018) with an approved credit of 18.2 MCHF in the scientific life of the ILL.

Each extension was approved by the Federal Council upon request of the Federal Office responsible for Switzerland's participation in ILL at the time. Prior to such a request, funding had to be approved by the Parliament within the respective Education, Research and Innovation (ERI) bills. In autumn 2016, upon a proposal by the State secretariat for Education, Research and Innovation (SERI), the Parliament within the ERI bill 2017-2020 approved a credit of 14.4 MCHF for the scientific partnership of Switzerland with the ILL in the period 2019-2023. Such an early decision gives planning stability for both contracting partners.

It is not exaggerated to speak about a true success story with respect to this scientific partnership:

- The rate of utilisation of the ILL facility by Swiss researchers always exceeds the Swiss contribution because of the high quality of the proposals submitted due to the experience gained at the SINQ facility. In addition, the number of high-impact ILL publications with Swiss authors is well above the ILL average which itself justifies the level of beam time allocated.
- The use, maintenance and upgrades of the ILL infrastructure creates substantial orders for Swiss industry. The most prominent example is the company SwissNeutronics that was founded in 1999 as a spin-off company of the PSI offering products to cover a wide range of neutron optics as neutron supermirror coatings for neutron guides.

These two points together with the very positive outcome of regular external evaluations of the Swiss participation in the ILL (in 1993 by W.G. Stirling UK and in 2002 by Th. Brückel DE) were enough justification and motivation for a seamless continuation of this very fruitful partnership fully carried by the Parliament (approving the necessary funds) and by the Federal Council (approving the renewal of the contracts with the ILL).

## 4. European Spallation Source (ESS) – preparatory phase and design update

Already in 2002, the evaluation undertaken by Th. Brückel contains a recommendation saying:

> Pulsed MW spallation sources will offer fundamentally new possibilities for neutron scattering compared to current sources with gains in performance of one to two orders of magnitude for many experiments. To stay at the forefront of neutron research, Switzerland should follow closely these developments, e.g. through a participation in the ESS project or experiments at SNS and JSNS. AUSTRON provides no true alternative to the ESS project for the Swiss community. ILL will remain the world leading neutron centre for the next five years until SNS and JSNS become fully operational. None of the European spallation source projects have an impact for the Swiss involvement at ILL in the next five years.

The Federal Office for Education and Science (BBW) – responsible for Switzerland's participation in ILL at the time – and its Deputy Director for Research (P.E. Zinsli) in close collaboration with the PSI followed the different stages of the ESS project very closely. Several stakeholder group meetings throughout Europe were organised in order to discuss scientific, technical, site, governance and funding issues for the most ambitious and broad-based spallation source in the world. A European international task force gathered in Bonn in 2002 to review all the findings and a positive consensus emerged to build ESS. The stakeholders group met a year later to review the task force's progress, and in 2003, a new design concept was adopted.

Over the next five years, a competitive and yet collaborative site selection process played out and Lund, Sweden was chosen as the preferred site; the Site Selection Committee – chaired by P.E. Zinsli – announced the definitive selection of Lund in Brussels on 28 May 2009. Switzerland joined the consensus for Lund as the most competitive offer with Sweden and Denmark funding 50% of the construction costs and easily reachable from Copenhagen airport.

In 2004, the European Strategy Forum on Research Infrastructures (ESFRI) started a roadmap process, which led to a first version in 2006 and to updated versions in 2008 and 2010. In all three versions of the ESFRI-Roadmap, the ESS project was strongly supported as the world's most powerful long-pulse source of neutrons.

In March 2011, the Federal Council endorsed the Swiss Roadmap for Research Infrastructures (CH-Roadmap) compiled by the State secretariat for Education and Research (SER). The CH-Roadmap contains the ESS prominently as the most important big international infrastructure project (in-line with the ESFRI-Roadmaps) with a compelling scientific case and advanced planning for decisions in the forthcoming ERI bill 2013-2016 period.

In July 2011, the Federal Council approved Switzerland's accession to the "Memorandum of Understanding (MoU) to the participation in the design update phase and declaration of intent for the construction and operation of the ESS". In September 2011, Switzerland formally joined the international ESS collaboration by signing the multilateral MoU. Since then, Switzerland took part in the project planning for and the design of the future research facility ESS with now 17 Partner Countries on board.

Already then many of those countries provided the project with significant support for the design update phase. Switzerland was relying on further growing expertise of the PSI for the development and optimization of the target necessary for the generation of the neutrons and the neutron beam extraction. During the years 2011-2014, the SER and later the SERI financially supported the PSI for its contributions to the ESS design phase with about 5 MCHF.

In February 2012, a dedicated funding line for the participation of Switzerland in the ESS was introduced into the ERI bill 2013-2016. At that time, the total costs for the construction of the facility stood at 1.4 BCHF and the legal framework or constitution for the project yet will have to be defined. At the end of 2012, the Parliament approved the ERI bill 2013-2016 with an ESS credit line of 32.4 MCHF for the years 2014 to 2019. The 32.4 MCHF for the first six years of the project were the result of considerations by the SERI also following the recommendations given in the CH-Roadmap 2011.

## 5. ESS – participation as a Founding Member

This endeavour started on 3 September 2014, when the Federal Council requested the Parliament to approve Switzerland's accession to the world's most powerful neutron source, the

ESS, as well as Switzerland's necessary financial contributions to the facility's construction and operation until 2026. To this effect, the Federal Council submitted a dedicated ESS bill to Parliament with the aim to consolidate Switzerland's position at the forefront of international research in the understanding that the ESS will complement existing facilities and allow Swiss researchers to conduct experiments, which are not possible in Switzerland.

End of 2012, Parliament already approved Switzerland's contribution of 32.4 MCHF to the first construction phase under the ERI bill 2013-2016.Through the dedicated ESS bill, approval of an additional Swiss contribution amounting to 97.8 MCHF for the second construction and operation phase until 2026 was sought. Switzerland's participation would then amount to 3.5% of the ESS' total costs of around 3.7 BCHF.

In addition to the substantial funding request of additional 97.8 MCHF, the dedicated ESS bill asked for Parliament approval of Switzerland acceding to a new European legal framework of international research cooperation. On a proposal by the European Commission, the EU Member States approved a new legal framework called ERIC (European Research Infrastructure Consortium), a regulatory framework establishing the main characteristics of European research infrastructures and clear procedures for awarding this status. However, no agreement between Switzerland and the European Commission was necessary for Switzerland to participate in the ESS-ERIC. Switzerland just needed to issue two statements of recognition of (1) the ERIC ordinance as the legal framework for the ESS and (2) the ESS-ERIC statutes.

The politically two delicate matters in the ERIC legal framework were (1) the application of EU law and (2) the European Court of Justice as the last instance in the case of disputes and litigation. The related legal text, authorising Switzerland to join the ESS-ERIC, was appended to the ESS bill in the form of a Federal resolution, which was subject to a referendum period of 100 days after Parliament approval and publication.

The parliamentary process was conducted according to standard procedures in the following 4 steps:

1. November 2014: Detailed deliberations of the ESS bill at the Commission for Science, Education and Culture of the Council of States with positive recommendation
2. December 2014: approval of the ESS bill by the Council of States in the winter session
3. February 2015: Detailed deliberations of the ESS bill at the Commission for Science, Education and Culture of the National Council with positive recommendation
4. March 2015: approval of the ESS bill by the National Council in the spring session

SERI provided a comprehensive documentation for the work of the Commissions and the author of this article presented the ESS-ERIC project to their members. With State Secretary Dell'Ambrogio and PSI Director Mesot being present, the Q&A sessions were very supportive. Both Commissions judged the project in Lund to be outstanding and an active Swiss participation therefore as a must.

Following the two positive Commissions' recommendations, Federal Councillor Schneider-Ammann presented the bill to the plenum of the Council of States and National Council.

Despite the two “hot” topics in the ERIC legal framework mentioned above, both chambers approved the bill with comfortable majorities. As was to be expected, the parliamentarians who abstained or voted against were all members of the Swiss People's Party. It was quite impressive to see so many positive votes.

The binding approval of the requested funding level and Federal resolution with respect to the participation of Switzerland in the ESS-ERIC project was given in the final vote of both Parliament Chambers on 20 March 2015; a bright day for our country to join another important and big international infrastructure project with a compelling scientific case.

On 31 March 2015, the Federal resolution was published in the official bulletin. 100 days later, on 9 July 2015, the deadline for a possible referendum expired without any actions being taken. On 10 July 2015 – 5 days before the deadline decided by the ESS Steering Committee – Switzerland recognised (1) the ERIC ordinance as the legal framework for the ESS and (2) the ESS-ERIC statutes. On that date, Switzerland became an ESS-ERIC Founding Member and the ESS credit line was increased by 97.8 MCHF from 32.4 MCHF to 130.2 MCHF for the period until 2026.

In this ESS-ERIC approval process, the motivation, dedication and joint effort of all the stakeholders in a quite ambitious schedule was key in order to achieve “mission accomplished” in good time.

## 6. Summary and conclusions

As referred to in the introduction of this article, the Swiss participation in ILL and ESS was indeed made possible by a reasonably good level of funding at the time needed. However, as illustrated in this article, no funding would be available without proper application and execution of the democratic processes and well defined procedures in connection with decisions taken by the Federal Council and the Parliament.

In my view, there are three pillars for having been so successful over the past 30 years on funding of the Swiss participation in international neutron scattering facilities:

1. The excellent relations and strong interactions among all stakeholders (BBW, SER, SERI, PSI, EPFL, SNSS represented by its President, …)
2. Outstanding Swiss scientists and researchers in this field submitting compelling proposals and getting high beam time allocations leading to over proportional high-impact publications
3. The continuous increase in experience gained at the SINQ and PSI’s expertise in target, shielding and modelling matters topped with key competencies in instrument development

Let me conclude by thanking all my collaborators and friends for their unbroken support and valuable contributions over the past 20 years. It was a joint undertaking for the many prolongations of our scientific member contract with the ILL and the participation in the ESS-ERIC as a Founding Member. For both endeavours, I wish all persons involved continuous success in the future.

# Announcements

## SGN/SSDN Members

Presently the SGN has 212 members. New members can register online on the SGN website: http://sgn.web.psi.ch

## SGN/SSDN Annual Member Fee

The SGN/SSDN members are kindly asked to pay their annual member fees. At the general assembly 2013 of the society, the fee has been increased from CHF 10 to **CHF 20**. It can be paid either by bank transfer or in cash during your next visit at PSI. The bank account of the society is accessible for both Swiss national and international bank transfers:
Postfinance: 50-70723-6 (BIC: POFICHBE),
IBAN: CH39 0900 0000 5007 0723 6.

The SGN is an organization with tax charitable status. All fees and donations payed to the SGN are **tax deductible**.

## PSI Facility News

Recent news and scientific highlights of the three major PSI user facilities SLS, SINQ and SμS can be found in the **quarterly electronic newsletter** available online under:
https://www.psi.ch/science/facility-newsletter

## SINQ Call for Proposals

The next **deadline** for the submission of beam time requests for the Swiss spallation neutron source 'SINQ' (http://sinq.web.psi.ch) is:
**Feb 20, 2018**

## Registration of publications

Please remember to **register all publications either based on data taken at SINQ, SLS, SμS or having a PSI co-author** to the Digital User Office: https://duo.psi.ch. Please follow the link 'Publications' from your DUO main menu.

## Open Positions at SINQ and ILL

To look for open positions at SINQ or ILL, have a look at the following webpages:
https://www.psi.ch/pa/stellenangebote/
https://www.ill.eu/careers/all-our-vacancies/?L=0

## PhD positions at ILL

The PhD program of the Institut Laue-Langevin, ILL, is open to researchers in Switzerland. Consult the page: https://www.ill.eu/science-technology/phd-students/home/
for information on the PhD program of ILL or get in contact with the managers of the program using the email address phd_rep@ill.eu.
The Swiss agreement with the ILL includes that ILL funds and hosts one PhD student from Switzerland.

# Minutes of the SGN/SSDN General Assembly 2016

**Date/Location**
November 10, 2016, Paul Scherrer Institut

**Start**
17:00

**End**
18:00

**Participants**
14 members of the society, 4 non-members

U. Gasser
January 2017

## 1. Welcome

Michel Kenzelmann, board member of the SGN/SSDN, welcomes the participants to the general assembly 2016. The president of the society, Henrik Ronnow, is not present due to a neutron related meeting in Bern.

## 2. Minutes of the General Assembly 2015

The minutes of the general assembly of the SGN/SSDN from 2.9.2015, published in Swiss Neutron News #46 are accepted without objections.

## 3. Annual Report of the Chairman

M. Kenzelmann reports on the activities of the SGN/SSDN in the years 2015 and 2016:
a) The second (2015) and third (2016) Young Scientist Prize of the SGN/SSDN sponsored by Swiss Neutronics have been awarded to Dr. Jonas Okkels Birk and to Dr. Andrea Scotti, respectively.
b) Two issues of Swiss Neutron News have appeared in March and October 2015 and another two have appeared in March and September 2016.
c) The SGN/SSDN has 201 members at the time of the assembly.

## 4. Report of the Treasurer

The annual balance sheet 2015 is presented: Assets SGN/SSDN on 1.1.2015: **SFr 4860.00**

| | **Revenues [SFr]** | **Expenses [SFr]** |
|---|---|---|
| Membership-fees (cash box) | 230.00 | |
| Membership-fees (postal check acc.) | 580.00 | |
| Donations | 15.00 | |
| Deposit prize money (A. Scotti) | 1000.00 | |
| Interest | 0.40 | |
| | | |
| Expenses PC account | | 66.20 |
| Apero Lyceum Alpinum Zuoz | | 476.00 |
| Payout prize money | | 1000.00 |
| Total | 1825.40 | 1542.20 |

| | | |
|---|---|---|
| Net earnings 2015 | **SFr 283.20** | |

| **Balance sheet 2015:** | **Assets [SFr]** | **Liabilities [SFr]** |
|---|---|---|
| Postal check account | 5143.20 | |
| Cash box | 0.00 | |
| **Assets on 31.12.2014** | **5143.20** | |

## 5. Report of the Auditors

### Bericht der Revisoren

Die Rechnungsrevisoren haben die Belege, die Abrechnungen und die Bilanz für das Jahr 2015 geprüft und für in Ordnung befunden!

| | | | |
|---|---|---|---|
| 7.1.16 | | 26.1.16 | |
| Datum | Dr. M. Zolliker, PSI | Datum | Dr. K. Krämer, Uni Bern |

Both Auditors (K. Krämer and M. Zolliker) have examined the bookkeeping and the balance 2015. They have accepted it without objection.

The participants therefore unanimously vote for the release of the SGN/SSDN board.

## 6. Budget 2017

M. Kenzelmann presents the following proposal for the budget 2017:

| | **Receipts [SFr]** | **Expenditures [SFr]** |
|---|---|---|
| member fees | 800.00 | |
| interest | 0.00 | |
| welcome receptioN | | |
| PSI Summer School | | 600.00 |
| fees PC account | | 50.00 |
| Total | 800.00 | 650.00 |
| Total receipts 2016 | 150.00 | |
| assets 31.12.2017 | 5010.00 | |

The participants accept the budget proposal unanimously.

## 7. SGN board for the period Sept. 2015 - Sept. 2018

The SGN board, Prof. Henrik Ronnow (president), Prof. Michel Kenzelmann, Dr. Eleonora Livia Bove, and Dr. Urs Gasser (secretary) was re-elected at the general assembly 2015. Livia Bove has now left EPFL and is back in France. Therefore, she may be replaced before the term of the board ends in 2018. Recommendations for a successor of Livia Bove are welcome and should be sent to the SGN board.

## 8. News from ENSA (from H. Ronnow)

a. Since 2015, Christiane Alba-Simionesco (LLB, France) is the chairperson of ENSA, and Ferenc Mezei (ESS) is the vice-chairman.
b. As ESS is now being built, ENSA is working on its role and to find a balance between a “support all” and a “opinionated expert’s voice” role.
c. Opinions and input of the SGN members concerning the European neutron landscape and the future need of access to ESS and ILL are welcome and should be

communicated directly to ENSA or to the SGN board.

d. Within ENSA, there is a discussion about the need for compact neutron sources with a cost on the order of 100 MCHF, which is mainly driven by the research centers Jülich and Saclay.

## 9. News from ILL (from Ch. Rüegg)

a. The ILL reactor has been operated in 2016 with three reactor cycles, and three cycles are also planned for 2017 and 2018. In 2019, only two cycles are planned due to a half-year shutdown for work on the reactor. This reduction of neutron production will coincide with the SINQ upgrade, which implies a strongly reduced access to neutron sources for Swiss researchers. Three or four reactor cycles are planned for 2020 and 2021.
b. There was again a very high request for beam time by Swiss users who got about 6% of the available beam time at ILL. This is about twice the beam time that Switzerland pays for.
c. As in 2015, the ENDURANCE program continues with high-priority projects. These include new sample environments, the Bastille software project, new neutron guides, the fission product prompt gamma-ray spectrometer FIPPS, and the high-density ultra-cold neutron source SuperSUN. ENDURANCE also comprises updates D7+, D10+, XtremeD, and Panther, which are mostly for magnetism, as well as Figaro/Rainbows, Ramses, and IN5+.
d. The Swiss Parliament has opened a new funding line amounting to 14.4 MCHF, which sets the ground for a possible renewal of the scientific membership of Switzerland in ILL over the years 2019-2023. The Swiss contributions to ILL is 22.8 MCHF for 2009-2013, 18.2 MCHF for 2014-2018, and 14.4 MCHF for 2019-2023.
e. As announced earlier, EPFL and CEA have signed a contract for a Swiss participation in the CEA-CRG instruments IN22, IN12, and D23. Proposals for  access to these instruments have to be submitted via the usual proposal process of ILL.

## 10. News from ESS (from Ch. Rüegg)

a. The European Spallation Source (ESS) is under construction in Lund, Sweden, and is planned to become operational in 2019. Switzerland is among the 17 member countries.
b. ESS is planned to have 16 operational instruments by 2025. Switzerland is involved in five instrument projects: the imaging beam line ODIN selected in 2013, the reflectometer ESTIA, the spectrometer BIFROST, and the powder diffractometer HEIMDAL selected in 2014, as well as the MAGIC single crystal diffractometer selected in 2015. These instrument projects are carried out in collaboration with Denmark, Germany, France, and Norway. Furthermore, Switzerland contributes to the neutron optics and the software of ESS.
c. First neutrons are planned for 2019 and the first eight instruments will be installed in 2020/21. These include ESTIA, BIFROST, ODIN, and MAGIC with Swiss participation.

The commissioning of the first instruments and the ramp-up to a power of 2 MW are planned for 2022.

## 11. News from SINQ (from Ch. Rüegg)

a. The SINQ upgrade project is close to receiving final approval. Two instruments are planned to be replaced or to receive a major upgrade: the powder diffractometer DMC and SANS-II. Both these instruments are planned to be placed in new positions in the guide hall. The reflectometer AMOR will receive a Selene guide and will be rebuilt to allow for tilting angles up to 20 degrees in the horizontal plane. The spectrometer Rita2 gets more space for the CAMEA setup. The instruments TASP, FOCUS, SANS-I, and Rita2 will not be rebuilt. All neutron guides from the source to the instruments will be upgraded. The cost of the guide upgrade is estimated to be 11 MCHF.
b. The timeline of the SINQ upgrade includes a SINQ shutdown in 2019 for the exchange of the neutron guides and work in the neutron bunker. The commissioning of the instruments with minor upgrade (FOCUS, TASP, SANS-I, Rita2, Morpheus) is planned for January and February 2020. The second commissioning phase for AMOR, DMC, SANS-II and the instruments Orion and Narziss without user access is planned to follow later in 2020.

## 12. Miscellaneous

a. Eberhard Lehman proposes to change the name of the society from “Swiss Neutron Scattering Society” to “Swiss Society for Neutron Research”, as this new name would include neutron imaging, and other users of SINQ, e.g. from radio chemistry. It is decided that this proposal will be emailed to all SGN members and a vote will be organized.
b. Peter Fischer asks about the status of the SINQ target after the SINQ failure in summer 2016. The replacement of the target with one having the same design has been approved with the restriction of a limited total flux. This implies that neutron production might end before the end of December in 2017.

# Conference Report: European Crystallographic Meeting in Basel

**August 28 to Sept. 1, 2016**
**Surrounded by eight satellites meetings**

**Katharina Fromm**
University of Fribourg (chair),

**Jürg Schefer**
Paul Scherrer Institut (co-chair)

Reprint from SGK/SSCr Newsletter No. 97, page 7-13.

In 2012, the general Assembly of the SGK/SSCr in Zurich decided to bid for an ECM meeting in Switzerland, which was approved in August of the same year by the council of the European Crystallographic Association (ECA) in Bergen, Norway. After four years of preparation the European Crystallographic Meeting 2016 (ECM-30) finally saw the light on Sunday, August 28th, 2016 at 17h with some 500-600 people attending the opening ceremony in room San Francisco of the Basel Conference Center. The alphorn trio Solodurum entertained with its performance in a typical Swiss way. Chemical experiments after the welcoming talk by Katharina Fromm and the welcome address by Mauro Dell'Ambrogio, the Swiss State Secretary for Education, Research and Innovation were leading over to the scientific scope of the event. Hans-Peter Wessels from the Government of the Canton of

Alphorn Trio Solodurum, http://www.solodurum.ch/

Katharina Fromm (chair) and Jürg Schefer (co-chair) of ECM30 presenting chemical experiments.


Opening words of Joël Mesot, director of Paul Scherrer Institute, Villigen.

Basel-City welcomed the participants on behalf of the hosting town, followed by Joël Mesot, Director of the Paul Scherrer Institute, Piero Macchi, President of the Swiss Society for Crystallography and Alessia Bacchi, President of the European Crystallographic Association.


Mauro Dell'Ambrogio, Swiss State Secretary for Education, Research and Innovation, addressing ECM30.

During the second hour of the opening session, Udo Heinemann presented the Max Perutz Prize to Vaclav Petříček from Prague, who gave his prize lecture in the following. The welcome reception was sponsored by the City of Basel. The exhibitor area was the perfect place for this, allowing the participants and exhibitors to mix: ECM's are (and should be) also a yearly event for the crystallographic "family".

The second day started with the plenary lecture by Nobel Prize Laureate Ada Yonath from Israel. Her fascinating talk was appreciated by a very large and broad public, and her energy and enthusiasm were a model to many

Ada Yonath, Nobel Prize Laureate in Chemistry (2009) during the opening plenary.

young scientists. The microsymposia kicked off at 10h with seven parallel sessions. Especially fascinating were the new approaches to overcome the problem of resistance to present antibiotics. Several special interest groups met over lunch time, a commercial user workshop and the software fayre also took place between 12h and 14h. From 14h-16h, again seven microsymposia took place. The next highlights were the keynote talks by Peter Schurtenberger and Francesca Fabbiani (in parallel from 16h30-17h30, while all participants had a chance to mix and meet around the first poster session which lasted until 19h30. A Young Crystallographers' Mixer took place later that evening 105m above Basel in the Bar Rouge, to which 100 out of the 200 registered young scientists turned up.

Tuesday morning started at 8h30 with two well-attended, excellent keynote lectures by François Diederich and Birger Dittrich, followed by six parallel microsymposia until 12h. The lunch break was again occupied by special and general interest group meetings, the software fayre and a commercial user workshop, as well as the first ECM-31 program committee meeting, where Katharina Fromm will be a member. Following the six parallel


Group picture of the participants of the first ECM science slam sponsored by STOE.

sessions from 14-16h, Sandra W. Jacob, and Marcus Neumann delivered their highly interesting keynote lectures. At 19h, a world premiere, the very first ECM-Science-Slam sponsored by STOE took place in room Sydney in front of ca. 300 listeners. Six young scientists from across Europe were selected from the poster abstracts and invited three months before the conference to participate. All six accepted the challenge, and the well-attended session was filled with six excellent three-minutes-presentations by these talented young candidates. It was Gregor Hofer from Zürich who convinced, in the end, the public with his presentation on the Zurich street parade to explain the pair-distribution-function. The Science Slam was immediately followed by the Bertaut Prize ceremony, during which Udo Heinemann presented the prize to Linda Reinhard.

Wednesday morning saw two brilliant keynote presentations by Jan Pieter Abrahams and Simon Parsons before kicking off with six parallel sessions until 12h. The lunch break was again used for the ECA Council, several special and general interest groups, the software fayre and the general assembly of the Swiss Society for Crystallography. After six parallel microsymposia between 14h and 16h, Makoto Fujita and Olivier Thomas as well as Robert von Dreele and Petra Fromme delivered their excellent keynote talks. Some 350 participants then joined the apéro and the conference dinner at the zoo of Basel. The excellent Basel transport system allowed a gapless transfer from the last session to this event.

Thursday started with two keynote lectures by Werner Paulus and Bob Cernik, followed again by six parallel sessions. The lunch breaks got filled with meetings of the Euro-

Lively discussion during  the two poster sessions in the modern congress center, among them our long term members Hans Grimmer and Howard D. Flack (picture on the left).

pean Crystallographic Association (ECA) and the special and general interest groups (SIG/ GIG), the software fayre and some commercial presentations. The afternoon sessions were again well attended, as throughout the conference (the organizers were surprised to see the smaller lecture halls often more than full), before the last keynote lectures by Marek Grzelczak and Martin Schmitt took place. The room Sydney crowded up for the second plenary lecture by Nobel Prize Laureate Jean-Marie Lehn from Strasbourg, who gave a scientifically brilliant and fascinating talk. Immediately following this talk, the poster prize ceremony took place, and ECM-30 delivered a total of 21 prizes to promising young scientists. A list of the winners and the sponsors will be published on the ECA website. Short presentations invited the participant to future meetings, in particular, the crystallography school in Warsaw and ECM-31 in Oviedo. With short speeches from Piero Macchi, Alessia Bacchi, and Katharina Fromm, the conference was declared closed.

Some 60 participants had the opportunity to visit the SwissFEL just some weeks before its inauguration. As further social events, some 30-40 persons visited the Roche and Novartis Campus, and about the same number participated in the historical city tour, while others chose to participate in a guided tour through the zoo before the conference dinner.

Apéro at the Basel Zoo next to the new modern elephant territory, just prrior to the conference dinner.

Assembling in front of the PSI School building, ready for the SwissFEL tour at Paul Scherrer Insitute.

In total, 931 participants from 47 countries were registered, showing that ECMs are not only visible in Europe but throughout the world. Indeed, participants from as far as Australia, Malaysia, Ecuador, Brazil, Mexico, Singapore, Canada, Taiwan, Hong Kong, Japan, the US or Korea were present. Close to 1/3 of all participants was female. 178 participants came from Switzerland, 166 from Germany, 116 from the UK. The fact that 47 different countries were present shows that the mobility of scientists across borders is very important for our community. Hence, the fact that governments hinder scientists from traveling is not acceptable as pointed out also in the opening ceremony by Swiss officials. A few registered members could not attend due to last minute visa issues.

The participation to the conference microsymposia proved to be very good and intense from the first to the last day including the closing ceremony. In particular, the exhibitors appreciated the conference center allowing an excellent mix of their exhibition and the participants. Also the professional tools of the professional Congress organizer (Congrex, Basel) such as the on-line program proved to be running perfectly. The atmosphere was thus overall excellent with a lot of smiles on people's faces. The opening with chemical experiments, the newly introduced Science Slam and the conference dinner at the zoo were perceived as "charming highlights" in addition to the top scientific talks of the conference. As an experience also from previous ECM's, it was hard to predict which sessions would be attended by how many delegates. It thus happened that some rooms got packed with people standing inside and outside of the room, despite the fact that we had taken into account the results/numbers from previous ECMs. Serving hot lunches and including this service into the conference fee allowed the participants to stay permanently in the conference venue, using the time for discussions with other participants and exhibitors.


8th Erwin Felix Lewy Bertaut Prize (ECA/ENSA) winner Linda Reinhard from the Department of Cell and Molecular Biology of the Karolinska Institute at DESY, Hamburg during the prize presentation. Right: Alessia Bacchi (president ECA), left: Udo Heinemann (Vice president ECA).

Young Crystallographers Mixer in the "Bar Rouge", displaying the ECM30 logo even before the conference start at the top of the Messetower, 105 meter above Basel.

Concerning satellite meetings, there was a total of eight such workshops/meetings, organized mainly before ECM-30:

- PSI Powder Diffraction School PDS2016 – Modern Synchrotron Methods (PSI Villigen)
- Robert F. Stewart School on Electron Density and Related Properties (the University of Lorraine, Nancy, France)
- Young Crystallographers ECM-30 Satellite Meeting (Pharmacenter, University of Basel)
- Crystallography in the Pharmaceutical Industry Workshop (Biocenter, University of Basel)
- The CSD Python API: A Foundation for Innovation (Biocenter, Basel)
- High Data Rate MX Satellite Meeting (Biocenter, Basel)
- A Workshop on Methods in Crystallographic Computing (Lossburg-Wittendorf, Germany)
- SMARTER 5 Meeting – Structure elucidation by combining Magnetic Resonance, Computational Modelling and Diffraction (University of Bayreuth, Germany)

The Young Crystallographers, for instance, had organized a satellite meeting on Sunday at which some 25 members participated. The Pharmaceutical Industry workshop counted 60 participants and was also held on Sunday. Most of the venues for these satellite meetings were at universities or research centers, bringing them closer to research but also benefitting from lower infrastructure costs.

For setting up the program, we counted on the help of all the SIGs and GIGs. However, we would suggest programming half a day by the local organizer to allow the ECM's to include local and global trends faster, attracting new communities and build up new SIGs.

ECM30 in Basel showed that crystallography is essential for today's science topics. Not only fields of physics, chemistry and biology are merging, but also the used technologies are widening, as reflected by talks involving microscopy or local probing techniques. We hope this will also be reflected in future teaching efforts in Switzerland, maybe by a common effort of universities.

Only thanks to the generous support from governments, science foundations and the support from volunteers all over the world, it was possible to organize this conference in the beautiful city of Basel. Overall, the conference was very successful from a scientific and organizational point of view. It was worth taking the risk to bring such a conference to Switzerland. We are glad having proposed it to the General Assembly of the Swiss Society for Crystallography in 2010 and thank all the participants, boards, and sponsors for making the meeting a success.

## Appendix: Picture Galerie from the Plenary and the Keynote Lectures

### Plenary Lecturers:

Ada E. Yonath
Nobel Prize Laureate
in Chemistry, 2009

Jean-Marie Lehn
Nobel Prize Laureate
in Chemistry, 1987

### Keynote Lecturers:

Peter Schurtenberger

Francesca Fabbiani

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**Picture Credits**

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# Conferences and Workshops 2017 and beyond

An updated list with online links can be found here:
http://www.psi.ch/useroffice/conference-calendar

## May 2017

Macromolecular Crystallography School 2017
May 5-10, 2017, Madrid, Spain

Advanced Workshop on Cryo-Electron Tomography, May 6-12, 2017, Vienna, Austria

Swedish National Cryo-EM Facility Inaugural Symposium, May 8-9, 2017, Stockholm and Umeå, Sweden

CETS2017 - 11th Central European Training School on Neutron Techniques
May 8-12, 2017, Budapest, Hungary

US School on Total Scattering Analysis
May 8-12, 2017, Oak Ridge National Laboratory, TN, USA

HG2BG2017: 3rd installment of 'The Hitchhiker's Guide to the Biomolecular Galaxy'
May 10-11, 2017, Purdue, IN, USA

Understanding Biology Through Structure 2017, May 13-17, 2017, Santa Fe, NM, USA

11th International Symposium on the Characterization of Porous Solids (COPS-XI)
May 14-17, 2017, Avignon, France

Protein quality control: Success and failure in health and disease
May 14-19, 2017, Sant Feliu de Guixols, Spain

IPAC17: 8th International Particle Accelerator Conference
May 14-19, 2017, Copenhagen, Denmark

13th Canadian Neutron Scattering Summer School, May 15-17, 2017, Chalk River, Canada

DEUNET: Deuteration for Neutron Scattering – Workshop, May 15-17, 2017, Oxford, UK

19th HERCULES Specialized Course Quantitative Imaging with X-rays and Neutrons
May 15-17, 2017, Grenoble, France

Membrane Proteins: Structure & Function. A Cold Spring Harbor Asia conference
May 15-19, 2017, Suzhou, China

iNEXT course: X-ray and neutron diffraction studies of macromolecules - from data collection to structures
May 15-19, 2017, Oulu, Finland

13th Canadian Neutron Scattering Summer School, May 15-19, 2017, Chalk River Laboratories, Deep River, Canada

9th MaMaSELF Status Meeting
May 16-19, 2017, Rigi Kulm, Switzerland

Modern Trends in Mathematical Crystallography – 2nd Manila International Workshop on Mathematical Crystallography
May 20-24, 2017, Manila, Philippines

Molecular and Cell Biology of Membranes
May 21-23, 2017, EMBL Heidelberg, Germany

2017 MicroED: First of two back-to-back workshops, May 21-24, 2017, Ashburn, VA, USA

E-MRS Spring Meeting and Exhibit
May 22-26, 2017, Strasbourg, France

IBSBM2017: Instruct Biennial Structural Biology Meeting
May 24-26, 2017, Brno, Czech Republic

2017 MicroED: Second of two back-to-back workshops, May 24-27, 2017, Ashburn, VA, USA

2017 Annual Meeting of the American Crystallographic Association
May 26-30, 2017, New Orleans, LA, USA

PARI2017: Public Awareness of Research Infrastructures - Communicating the importance of science to society
May 29-30, 2017, Garching, Germany

JDN2017: Journées de la Diffusion Neutronique 2017, May 29-31, 2017, Carry le Rouet, France

6th International School on Biological Crystallization
May 29 - June 2, 2017, Granada, Spain

Total Scattering for Nanotechnology on the Como Lake: To.Sca Lake 2.0
May 29 - June 2, 2017, Como, Italy

6th ALMA Conference 'painting as a Story' and 2nd CrysAC Workshop
May 31 - June 3, 2017, Brno, Czech Republic

## June 2017

International School of Crystallography 50th Course: Integrative Structural Biology
June 2-11, 2017, Erice (Sicily), Italy

IMMW20: International Magnetic Measurement Workshop, June 4-9, 2017, Diamond Light Source, Didcot, UK

Bioenergetics (GRC)
June 4-9, 2017, Andover, NH, USA

Nucleic Acids (GRC)
June 4-9, 2017, Biddeford, ME, USA

Membrane Protein Folding (GRC)
June 4-9, 2017, Easton, MA, USA

Superconductivity (GRC)
June 4-9, 2017, Waterville Valley, NH, USA

New directions in porous crystalline materials: Faraday Discussion
June 5-7, 2017, Edinburgh, UK

canSAS: Small Angle Scattering Workshop
June 5-7, 2017, San Francisco, CA, USA

8th Workshop on Neutron Scattering Applications in Structural Biology
June 5-9, 2017, Oak Ridge, TN, USA

Session I - Fundamentals of X-ray Powder Diffraction. ICDD X-ray Diffraction Clinic
June 5-9, 2017, Newton Square, PA, USA

International Workshop on Computational Nanotechnology
June 5-9, 2017, Windermere, UK

4th NovAliX Conference: Biophysics in Drug Discovery 2017
June 6-9, 2017, Strasbourg, France

Neutrons in Structural Biology
June 7-9, 2017, Grenoble, France

47th Annual Mid-Atlantic Macromolecular Crystallography Meeting
June 7-9, 2017, Baltimore, MD, USA

8th Workshop on Neutron Scattering Applications in Structural Biology
June 9-15, 2017, Oak Ridge, TN, USA

Shanghai International Crystallographic School Working with Bilbao Crystallographic Server, June 11-17, 2017, Shanghai, China

Zurich School of Crystallography 2017: Bring Your Own Crystals
June 11-22, 2017, Zurich, Switzerland

School on Charge Density and MoPro
June 12-15, 2017, Mexico City, Mexico

UXSS2017: Ultrafast X-ray Summer School
June 12-15, 2017, Hamburg, Germany

Session II - Advanced Methods in X-ray Powder Diffraction. ICDD X-ray Diffraction Clinic
June 12-16, 2017, Newton Square, PA, USA

Joint FEBS – EMBO ADVANCED LECTURE COURSE Molecular Architecture, Dynamics and Function of Biomembranes
June 12-21, 2017, Cargèse, Corsica, France

Joint annual XRF and XRD meetings of the BCA Industrial Group
June 14-15, 2017, Leicester, UK

Mineral Fibres: Crystal Chemistry, Chemical-Physical Properties, Biological Interaction and Toxicity, June 19-23, 2017, Modena, Italy

10th annual CCP4 crystallographic school “From data collection to structure refinement and beyond”
June 19-26, 2017, Argonne, IL, USA

Gordon Research Seminar on Crystal Growth and Assembly: From Atomic to Hierarchical Assemblies in Crystal Growth
June 24-25, 2017, Biddeford, ME, USA

CLEO/Europe - EQEC2017
June 25-29, 2017, Munich, Germany

Gordon Research Conference on Crystal Growth and Assembly: From Atomic to Hierarchical Assemblies in Crystal Growth
June 25-30, 2017, Biddeford, ME, USA

µSR2017: 14th International Conference on Muon Spin Rotation, Relaxation and Resonance
June 25-30, 2017, Sapporo, Hokkaido, Japan

ACA Summer Course, June 25 - July 2, 2017, Northwestern Univ., Evanston, IL, USA

ICTMS 2017: 3rd International Conference on Tomography of Materials and Structures
June 26-30, 2017, Lund, Sweden

IMOD/PEET Workshop for Cryo-Tomography of Biological Specimens
June 26-30, 2017, Rocky Mountain Labs, NIAID, NIH Hamilton, MT, USA

DSL2017: 13th International Conference on Diffusion in Solids and Liquids
June 26-30, 2017, Vienna, Austria

LCF8. Eighth International Conference on Low Cycle Fatigue
June 27-29, 2017, Dresden, Germany

MLZ conference on Neutrons for Health
June 27-30, 2017, Bad Reichenhall, Germany

48th BACG Annual Conference
June 27-30, 2017, Manchester, UK

## July 2017

2Erice School on Neutron Science and Instrumentation: Neutron Precession Techniques
July 1-8, 2017, Erice, Sicily, Italy

ECS4: 4th European Crystallographic School - High throughput structure analysis - from routine chemical problems to advanced applications, July 2-7, 2017, Warsaw, Poland

3rd Functional Oxide Thin Films for Advanced Energy and Information Technology Conference, July 3-5, 2017, Rome, Italy

VHCF7: Seventh International Conference on Very High Cycle Fatigue
July 3-5, 2017, Dresden, Germany

mmc2017: Microscience Microscopy Congress
July 3-6, 2017, Manchester, UK

Diffusion Fundamentals VII
July 3-7, 2017, Moscow, Russia

7th FEZA Conference The ZEOLITES: Materials with Engineered Properties
July 3-7, 2017, Sofia, Romania

Materials chemistry research and the economic health of the nation
July 4, 2017, Liverpool, UK

NOP2017: International Conference on Neutron Optics, July 5-8, 2017, Nara Kasugano International Forum, Japan

EMBO Practical Course: High-throughput protein production and crystallization
July 6-14, 2017, Harwell, UK

FEZA school, July 8-9, 2017, Sofia, Romania

ICNS 2017: 9th International Conference on Neutron Scattering, July 9-13, 2017, Daejeon Convention Center, Korea

UK Colloids 2017
July 10-12, 2017, Manchester, UK

MC13: 13th International Conference on Materials Chemistry
July 10-13, 2017, Liverpool, UK

19th IUPAB Congress and 11th EBSA Congress: IONIC LIQUIDS meet BIOMOLECULES
July 16-20, 2017, Edinburgh, UK

NTTI2017: New Trends in Topological Insulators, July 16-21, 2017, Congressi Stefano Franscini, Monte Verita, TI, Switzerland

25th International Symposium: Synthesis in Organic Chemistry
July 17-20, 2017, Oxford, UK

International Conference on Strongly Correlated Electron Systems
July 17-21, 2017, Prague, Czech Republic

1st SPSLNX: Sao Paulo School on Scattering: Diffraction and Imaging using Light, Neutrons and X-rays, July 17-21, 2017, Sao Paulo, Brazil

PPXRD-15: Pharmaceutical Powder X-ray Diffraction Symposium
July 18-20, 2017, Hyderabad, India

16th European Conference on Solid State Chemistry
July 23-26, 2017, Glasgow, UK

PS31.Protein Society's 31st Annual Symposium
July 24-27, 2017, Montreal, Canada

9th International Conference on Borate Glasses, Crystals and Melts and 2nd International Conference on Phosphate Glasses
July 24-28, 2017, Oxford, UK

ACCGE-21: 21st American Conference on Crystal Growth and OMVPE-18: Epitaxy and 18th US Workshop on Organometallic Vapor Phase Epitaxy (OMVPE-18)
July 30 - August 4, 2017, Santa Fe, NM, USA

Denver X-ray Conference (DXC)
July 31 - August 4, 2017, Big Sky, MT, USA

## August 2017

NXS 2017: National School on Neutron and X-ray Scattering, August 5-19, 2017, Argonne (IL) and Oak Ridge (TN), USA

M&M2017: Microscopy & Microanalysis
August 6-10, 2017, St. Louis, MO, USA

X-ray Nanoimaging: Instruments and Methods III, August 6-10, 2017, San Diego, CA, USA

Magnonics 2017, August 7-11, 2017, Oxford, UK

LT28: 28th International Conference on Low Temperature Physics
August 9-16, 2017, Gothenburg, Sweden

Q2XAFS2017: International Workshop on Improving Data Quality in XAFS Spectroscopy
August 14-15, 2017, Diamond Light Source, Oxfordshire, UK

Crystallographic Computing School
August 15-20, 2017, Bangalore, India

PPXRD-15: Pharmaceutical Powder X-ray Diffraction Symposium
August 18-20, 2017, Hyderabad, India

ICCM-21: 21st International Conference on Composite Materials
August 20-25, 2017, Xi'an, China

Microscopy Conference 2017
August 21-25, 2017, Lausanne, Switzerland

XXIV Congress & General Assembly of the International Union of Crystallography
August 21-28, 2017, Hyderabad, India

IXS2017: 10th International Conference on Inelastic X-ray Scattering, August 28 - September 1, 2017, DESY Hamburg, Germany

International School on Fundamental Crystallography and Workshop on Structural Phase Transitions
August 30 - September 4, 2017, Odisha, India

## September 2017

7th Cambridge Symposium on Nucleic Acids Chemistry and Biology
September 3-6, 2017, Cambridge, UK

ISIC20. 20th International Symposium on Industrial Crystallography
September 3-6, 2017, Dublin, Ireland

2017 edition of the Italian Association for Crystallography (AIC) International Crystallography School (AICS2017)
September 3-6, 2017, Pavia, Italy

55th EHPRG Meeting: High Pressure Science and Technology
September 3-8, 2017, Poznan, Poland

COLA 2017: International Conference on Laser Ablation
September 3-8, 2017, Marseille, France

15th Oxford School on Neutron Scattering
September 3-15, 2017, Oxford, United Kingdom

YUCOMAT 2017: 19th Annual Conference
September 4-8, 2017, Herceg Novi, Montenegro

IMF-2017: International Meeting on Ferroelectricity
September 4-8, 2017, San Antonio, TX, USA

PSI Master School 2017
September 4-15, 2017, Villigen, Switzerland

21st Laboratory Course Neutron Scattering
September 4-15, 2017, Jülich and Garching/Munich, Germany

EMBO practical course on image processing for cryo-electron microscopy
September 5-15, 2017, London, UK

Nanoanalysis and Structural Alloys
September 7-8, 2017, Drymen, UK

QMol 2017: Operating Quantum States in Atoms and Molecules at Surfaces
September 10-14, 2017, Ascona, Switzerland

EMBO Practical Course: Small angle neutron and X-ray scattering from proteins in solution
September 11-15, 2017, Grenoble, France

Swiss Society of Crystallography Annual Meeting, September 12, 2017, Geneva, Switzerland

6th German-French Workshop on Oxide, Dielectric, and Laser Crystals 2017
September 14-15, 2017, Bordeaux, France

EUROMAT2017 Symposium: Materials Science with Synchrotron Radiation X-rays
September 17-22, 2017, Thessaloniki, Greece

2017 E-MRS Fall Meeting and Exhibit
September 18-21, 2017, Warsaw, Poland

MECA SENS 2017: 9th International Conference on Mechanical Stress Evaluation by Neutron and Synchrotron Radiation
September 19-21, 2017, Skukuza, South Africa

WIRMS 2017: Infrared Microscopy and Spectroscopy with Accelerator Based Sources Workshop, September 25-28, 2017, Oxford, UK

NSS-9: The 9th International Workshop on Nanoscale Spectroscopy and Nanotechnology
September 25-28, 2017, Gyeongju, Rep. of Korea

SAXS Excites: The International SAXS Symposium 2017
September 26-27, 2017, Graz, Austria

20th Heart of Europe Bio-Crystallography (HEC meeting), September 28-30, 2017, Wojanow Castle (Jelenia Gora), Poland

## October 2017

ic-rmm3: 3rd International Conference on Rheology and Modeling of Materials
October 2-6, 2017, Miskolc-Lillafüred, Hungary

6th Joint Workshop on High Pressure, Planetary and Plasma Physics (HP4)
October 4-6, 2017, Göttingen, Germany

International School on Fundamental Crystallography and Electron Crystallography
October 8-13, 2017, Sofia, Bulgaria

VIII AUSE Congress and III ALBA User's Meeting, October 9-11, 2017, Madrid, Spain

Condensed Matter Research at the IBR-2
October 9-12, 2017, Dubna, Russia

ARW 2017: 6th Accelerator Reliability Workshop, October 15-20, 2017, Versailles, France

The 75th Annual Pittsburgh Diffraction Conference, October 19-21, 2017, Indiana, PA, USA

2017 Nuclear Science Symposium and Medical Imaging Conference, together with the 24th Symposium on Room-Temperature X- and Gamma-Ray Detectors
October 21-28, 2017, Atlanta, GA, USA

Advanced Topics in EM Structure Determination: Challenges and Opportunities
October 29 - November 3, 2017, New York, NY, USA

## November 2017

25th Protein Structure Determination in Industry Meeting
November 12-14, 2017, Cambridge, UK

Macromolecular Crystallography School 2017
November 13-23, 2017, Montevideo, Uruguay

ICG: Italian Crystal Growth
November 20-21, 2017, Milan, Italy

2017 MRS Fall Meeting and Exhibit
November 26 - December 1, 2017, Boston, MA, USA

## February 2018

MBV49: PSI Particle Physics Users' Meeting 2018
February 12-14, 2018, Villigen, Switzerland

## April 2018

mIPAC18: International Particle Accelerator Conference 2018
April 29 - May 4, 2018, Vancouver, BC, Canada

## May 2018

Fatigue 2018
May 27 - June 1, 2018, Poitiers, France

## June 2018

SRI 2018: 13th International Conference on Synchrotron Radiation Instrumentation
June 11-16, 2018, Taipei, Taiwan

## July 2018

SXNS15: 2018 International Conference on Surface X-ray and Neutron Scattering
July 15-19, 2018, Pohang Light Source, Republic of Korea

XAFS2018: 17th International Conference on X-ray Absorption Fine Structure
July 22-27, 2018, Kracow, Poland

## August 2018

XRM2018: 14th International Conference on X-ray Microscopy, August 19-24, 2018, Saskatoon, Saskatchewan, Canada

ECM31: 31st European Crystallographic Meeting, August 22-27, 2018, Oviedo, Spain

7th EuCheMS Chemistry Congress
August 26-30, 2018, Liverpool, UK

## October 2018

SAS2018: XVII International Conference on Small-Angle Scattering
October 7-12, 2018, Traverse City, MI, USA

# Editorial

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Swiss Neutron Scattering Society



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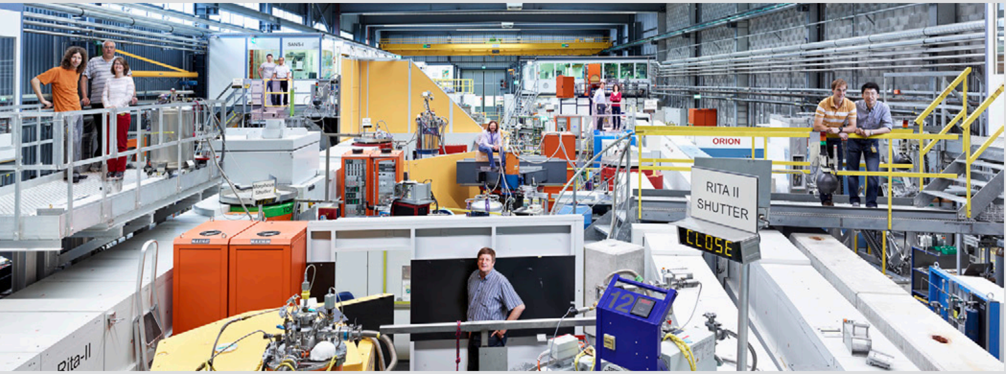


Tuesday, 18 April 2017 :: 9:30 h :: Auditorium :: Paul Scherrer Institut

# 20 years SINQ

## Programme

| | | |
|---|---|---|
| 09:30 | **Arrival of guests and welcome coffee** | |
| 10:00 | **Welcome** | Joël Mesot, Kurt Clausen |
| 10:10 | **SINQ – history, technical challenge and its performance** | Bertrand Blau |
| 10:30 | **Basics, current status and future of HIPA** | Mike Seidel |
| 10:50 | **Instrumentation at SINQ** | Peter Böni |
| 11:10 | **SINQ in the international context** | Helmut Schober |
| 11:30 | **Danscatt: Collaboration with Denmark** | Kell Mortensen |
| 11:50 | **Lunch break** | |
| 13:30 | **SINQ upgrade programme** | Uwe Filges |
| 13:50 | **Spectroscopy development** | Henrik Rønnow |
| 14:10 | **Discovery of a superconducting quantum critical point** | Daniel Mazzone |
| 14:20 | **Magnetic frustration effect in spinels** | Shang Gao |
| 14:30 | **Neutron imaging and electro-chemical systems** | Pierre Boillat |
| 14:50 | **Coffee break** | |
| 15:30 | **Neutron diffraction – status and prospects** | Dominik Schaniel |
| 15:50 | **Soft matter viewed with neutrons** | Ulf Olsson |
| 16:10 | **Kurt Clausen's career** | Robert Feidenhans'l, Colin Carlile, Joël Mesot |
| 16:40 | **SINQ Quo vadis** | Christian Rüegg |
| 17:00 | **End of programme / Apéro at PSI OASE** | |
| 18:00 | **Dinner** | |
| | **After dinner speaker** | Gabriel Aeppli |