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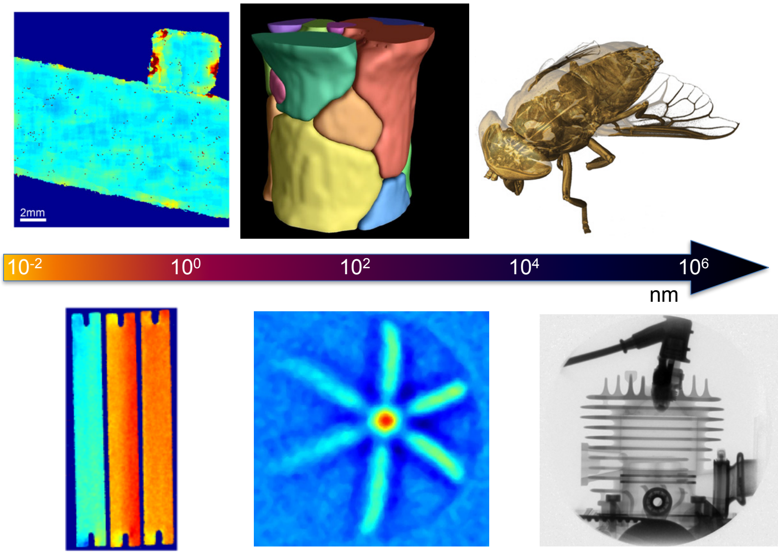
SWISS NEUTRON NEWS



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

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ON THE COVER:

Schematic of the length scales to be covered by the ODIN neutron imaging beamline at ESS. This includes the diffraction imaging regime (10^{-2} - 10^{1} nm), the SANS imaging regime (10^{1} - 10^{3} nm), and conventional imaging (10^{3} nm and beyond). See the related article "Designing and building a world-leading neutron imaging beamline at ESS: the ODIN project" by M. Morgano et al. Top left: 2D map of the full width at half maximum of the Bragg peak giving rise to the (-1 -1 0) reflection in a sample made of two iron crystals (result still to be published). Bottom left: The energy-selective image of three pyrolithic graphite crystals showing inhomogeneities in their crystalline orientation. Top middle: Reconstruction of the grain volume in a multi-crystalline Aluminum sample obtained by neutron diffraction imaging. More details on these three pictures are found in S. Peeterman's Ph.D. thesis "Energy-selective neutron imaging for materials science" (2014). Bottom middle: Transmission image obtained by means of Neutron Grating Interferometry of the flux line of the Shubnikov phase in a a type-II Niobium superconductor, picture used with permission from the authors (arXiv:1308.3612). Top right: High resolution 3D reconstruction of a fly. Bottom right: Radiography of a chainsaw engine..

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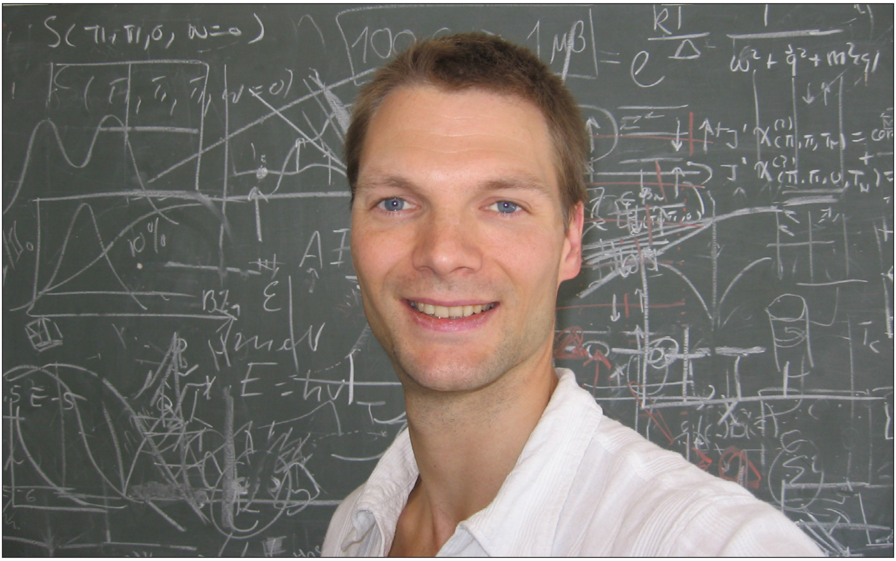

DEAR COLLEAGUES

Welcome to the autumn 2015 issue of Swiss Neutron News. In fact, writing this in the midst of a long heat-wave, I am almost looking forward to the autumn.

The first half of 2015 has as usual seen a number of exciting scientific achievements using neutron scattering, more of which we can look forward to hear about at the European Neutron Scattering Conference in Zaragoza, where I also expect to learn about interesting developments and inventions in the realms of instrumentation.

However, there have also been a number of challenges: J-PARC suffered several unexpected off-periods, ILL faces potentially increasing fuel prices, intention was announced to close down LLB in 2019. ESS will provide initially 16 instruments with performances much beyond existing capabilities – something that will undoubtedly lead to numerous breakthroughs. However, 16 instruments is less than any of the existing neutron sources, so in terms of volume or capacity for science not needing the ultimate flux or resolution, the existing sources are extremely important for our community. We must therefore strive to maintain capacity. Until ESS is completed this must be achieved by avoiding premature closure of facilities, and by ensuring that facilities are operated at their maximum capacity. Given the large fraction of fixed costs, operating a facility at partial capacity is simply put an extremely poor economical choice. If closure of a given source is unavoidable, we must seek that part of the liberated budget is invested into improving longevity and "through-put capacity" of remaining sources. Perhaps think about upgrading national sources to regional or European sources.

Related to the above considerations is the asymmetry of source-funding and beam-time allocation currently in place. ILL and in the future ESS are jointly funded by many countries, and beam-time is distributed according to contributions – thankfully with significant flexibility. The remaining sources allocate beam-time to users from anywhere in the world – solely based on scientific quality of the proposal. This latter scheme works when averaged over other types of large scientific infrastructure. The former scheme only really works if all sources were to do a % allocation per % contribution operation. I have no solution to this asymmetry short enough to describe on this president's page, but appeal to everybody – neutron scatterers, neutron managers, and neutron funders – to consider the broad picture and work towards a future where we have sufficient access to both flagship and workhorse experiments.

Chaleureusement,
Henrik M. Ronnow

Designing and building a world-leading neutron imaging beamline at ESS: the ODIN project

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ABSTRACT

Switzerland will play an important role in the construction of the European Spallation source, a large scale facility now under construction in Lund, Sweden, which will have a great impact for neutron research worldwide. ODIN will be one of the first three instruments that will be realized at ESS and it will be a future world-leading neutron imaging instrument. In this paper, we present the state of the work for the design and the realization of this a beamline, with a particular attention to the Swiss contribution for this flagship instrument that will foster new science and technical applications for the next decades.

INTRODUCTION

ESS will be a large-scale research facility opening the way towards new frontiers in neutron science [1]. It is now under construction in Lund (Sweden), while the organization is transforming into a European Research Infrastructure Consortium (ERIC), which is specific for establishing a legal framework for the construction and operation of research facilities of European interest [2]. In particular, ESS will be the world's most powerful neutron source, foreseen to be 30 times brighter than today's brightest European sources [3] (Fig. 1).

The project is to be realized through a substantial amount of in-kind contributions

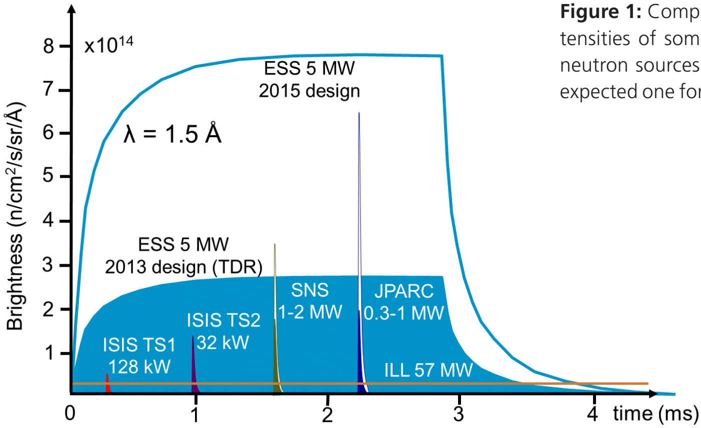

Figure 1: Comparison between the intensities of some of the more intense neutron sources in the world with the expected one for ESS.

by the 19 partners, with a large fraction of the building and operating costs (about 50%) covered in this manner [4]. Its operation is planned to start in late 2019. Among the first 3 instruments to pave the way for the construction of 19 others and starting commissioning with the source by that time, the Optical and Diffraction Imaging with Neutron (ODIN) beamline was chosen [5] (Fig 2).

Neutron imaging might be a less well known technique compared to X-ray imaging, however, it meanwhile is employed routinely not only for industrial and engineering applications but has demonstrated exciting potential for materials research [6]. Its purpose is the non-invasive structural and functional investigation of the interior of bulk samples from the macroscopic to the microscopic scale

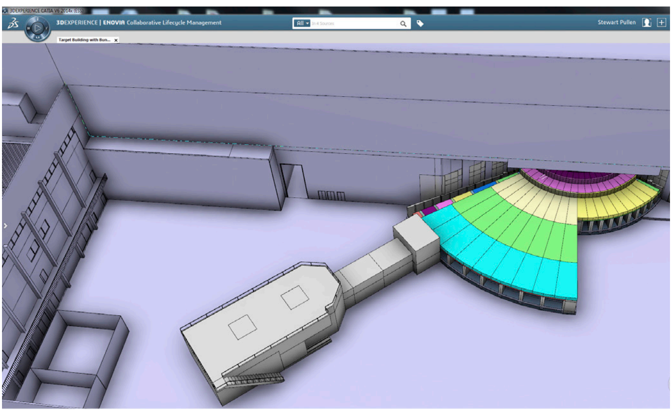

Figure 2: Preliminary 3D representation of the interior of the ESS main hall. ODIN is the only beamline shown in this picture, taking up one of the beamports in the sector for medium-length instruments.

and beyond. The basic principles are similar to those of X-ray imaging and conventional applications are based on the attenuation of the transmitted beam by the sample materials. Unlike the case of X-rays, the contrast achieved by neutrons, is given by nuclear processes, rather than atomic ones, which allows for an isotopic sensitivity unknown to X-rays. In addition to that, most metals tend to be penetrated easily by neutrons, while hydrogenated materials provide high contrast, and the opposite is true for X-rays. That is why the two techniques are often considered complementary.

Neutron interactions with matter are also highly dependent on the energy of the neutrons, which is a feature that can be exploited for instance to tune the contrast, to visualize crystalline features, to be sensitive to stress and strain in samples, or to suppress incoherent scattering from organic materials [7]. There are several ways to select particular energies/wavelengths from a polychromatic neutron beam, but with the availability of efficient pulsed sources, the most straight-forward method is the measurement of the time of flight (ToF) of neutrons arriving at the detector. To do so, one also has to know with sufficient precision when a detected neutron entered a well-defined flight path, a feature employed at pulsed sources such as the ESS. However at ESS in particular, the pulse is relatively long as compared to other state-of-the-art pulsed neutron sources, which requires a careful and challenging design of the beamline, which in return provides the flexibility to tune the energy resolution (and correspondingly the required exposure time and efficiency) to the requirements of a specific measurement. The ODIN beamline will fully exploit this flexibility which, paired with the very high flux produced by the source, will make it the world leading neutron imaging instrument.

In particular, this project will also benefit from the "lessons learned" in the similar projects RADEN (installed at J-PARC in Mito, Japan) and IMAT (under commissioning at ISIS target station 2 in Didcot, United Kingdom) [8]. The instrument leaders of these two ToF neutron imaging beamlines are both members of the Scientific and Technical Advisory Panel for ODIN, and are part of a broad open and communicative community that gathers especially during the yearly NEUWAVE meetings that are specifically organized to update all the other partners on progresses in the topic of energy selective neutron imaging. This continuous communication with external and experienced partners is bound to help in the process of building a successful instrument in time and on budget in the best possible way.

FEATURES OF THE ODIN BEAMLINE

A typical challenge for an imaging beamline is to be able to accommodate a large variety of objects to be investigated. The user base of such an instrument, in fact, is arguably the most diverse of all neutron instruments, ranging from fundamental science to engineering materials, from archeology to paleontology, from food to nuclear fuel research, from cultural heritage to geoscience and meteorites, not to mention the variety of industrial applications. The basic requirement for an imaging beamline is therefore to provide a large and homogeneous field of view (FoV) without significant spatial and spectral variations (that potentially hinder normalization and quantification). A FoV of 20x20 cm^2 at a distance of 10 meters from the neutron pinhole at the entrance of the beam to the instrument cave is foreseen in the case of ODIN [9]. This FoV should not have steep changes in intensity over the illuminated area because they are difficult to remove even with flat-field correction and, even in the case of proper removal, there would be a position-dependent noise level, which is of course undesirable. Furthermore, the spectrum should be independent of the position in the FoV, i.e. the area should be as spectrally homogenous as possible. For all these reasons, the neutron transport system is of utmost importance. The careful design of the supermirror-based guide system has to enable the transport of a divergence of 0.7 degrees for a very wide spectral range, i.e. from 1 to at least 10 Angstrom [9]. The requirement of spectral ranges of 4.5 and 9 A for normal and single pulse suppression modes, as needed for particular operation modes foreseen, coupled with the repetition rate of the source (14 Hz), but more importantly the loosest ToF resolution required coupled with the burst time of 2.86ms lead to the choice of the length of the instrument which is 60m. This implies that a guide system is required and is to be designed with great care. The efficiency of the transport has also a big impact on the final performance of the instrument: the higher the flux that can be transported, the faster the dynamical processes that can be reliably followed and visualized. With the planned performance of the source, an unprecedented time resolution shall be achievable. However, the spatial resolution limitations of today will also be affected by the high flux provided from the source as flux limitations play a significant role in improving resolution, not only in time but also in space, with the target of reaching the single micrometer regime.

To fully exploit the characteristics of the ESS source, a carefully designed transport system is not enough. The long pulse structure is only beneficial concerning the flexibility it allows for, if a chopper system is designed to flexibly tune the energy resolution, and hence allows for efficient lossless trade of resolution for flux. This is first achieved by a pair of choppers (referred to as Pulse Shaping Wavelength Frame Multiplication Choppers – WFMC [10]) at a variable distance from each other. These, together with a sophisticated cascade of choppers to remove spurious frame overlap, allow the instrument to reach various energy resolutions between the natural one of 10% (5%, 2.5%) at 2A (4A, 8A) and continuously from 1% down to 0.3% with constant wavelength resolution over the named spectral range [9] (Fig. 3).

The beamline has been designed around these parameters to allow for as large a variety of experiments as possible, from polychromatic neutron imaging, where no energy resolution is needed, to dark field imaging [11], where 10% energy resolution is sufficient

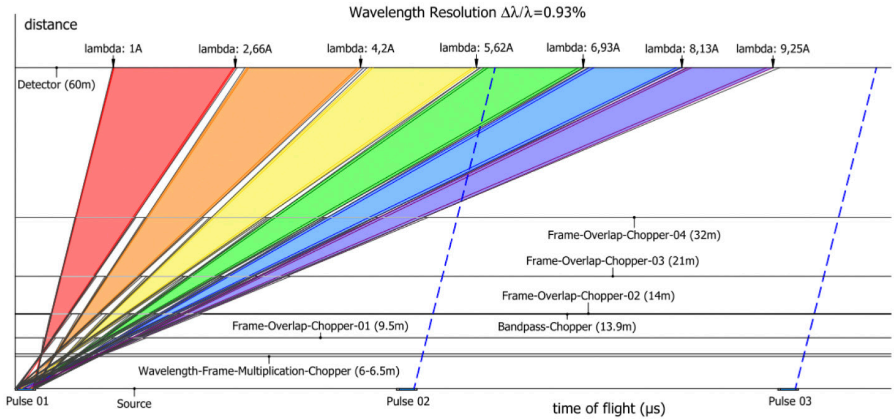

Figure 3: Time of flight plot for the maximum energy resolution mode of ODIN. The key component in shaping this time structure is the WFM chopper at 6.5m distance.

and any higher will just increase the data recording time, to Bragg edge imaging of crystalline phase distributions and changes and polarized neutron imaging requiring wavelength resolutions around 1% and finally stress and strain imaging, where to appreciate the subtle differences in crystal lattice arrangements induced by external forces, a very high energy resolution in the sub-percentage regime is required [12].

To add yet another level of flexibility, the endstation (the so-called "cave") of the instrument, where the actual experiments will be run, will be designed in such a way as to allow diffraction experiments to be run also simultaneously with the imaging with ample space and the possibility to employ more than one detector at the same time. Other add-ons already foreseen to complement the suite of techniques available at ODIN include a microfocus x-ray tube for simultaneous neutron and x-ray imaging, a set of polarizer, analyzer and spin flipper for magnetic imaging [13] and a grating [14] and SEMSANS [15] device for structural and magnetic structure imaging investigations in the (U)SANS regime.

THE ODIN PROJECT

The ODIN project started officially as one of the flagship day-one instrument at ESS, and in 2013 it was recommended for construction by the scientific and technical advisory panel. Paul Scherrer Institut (Switzerland), Helmholtz Zentrum Berlin and Technische Universität München (TUM, Germany) were the main partners of ESS, together with Delft University of Technology (Netherlands). Currently the partners for the construction of ODIN are working towards forming the formal consortium to deliver the so-called "tollgate 2 review" (TG2) in winter 2015 when, upon positive outcome, the preliminary design phase will end and detailed design will begin. Around this stage, the consortium shall be reorganized and, according to plan, ESS will transfer the project leadership to TUM, which shall provide the biggest part of ODIN with contributions of about 50%. PSI as another consortium partner plans about 35% total value of the contributions, and the remaining 15% will preliminarily be kept by ESS, while the final budget and initial scope of the project remain to be defined at TG2. Depending on scope and staging plan further (in-kind) partners might contribute as well.

Correspondingly a TUM contribution will be to appoint the lead engineer and the lead instrument scientist who will be the leader of the project and will be responsible to deliver, together with the other partners in 2019, the scope of the first stage of the instrument for commissioning. The main parts of the TUM contributions apart from the project lead are the shielding of the instrument which is of paramount importance for radiation safety and the minimization of the cross-talk between neighboring beamlines, the complete disc chopper system which, according to the current design, accounts for at least 7 chopper axes [16]. Other somewhat less visible but not less important components planned to be provided by TUM include the beamstop (part of shielding), the motion controls, and the heavy shutter system.

ESS will keep the responsibility to deliver the best time-of-flight imaging detector system, a crucial component to exploit ODIN at its best. In addition to that, the development and design of methodical configurations for dark-field imaging, polarized imaging etc., which are not certain in the scope of the initial project remain together with the potentially required T0 chopper (used for a precise shaping of the neutron pulse and a proper reduction of the background) within the responsibility of ESS. Apart from that, like in every instrument project ESS provides some key components like the safety system, the shielding bunker etc., which are, like the data handling and reduction and analysis software therefore not defined as a part of the ODIN project scope.

THE SWISS WORK PACKAGE IN DETAIL

PSI, the Swiss in-kind partner, has an important role in the delivery of the instrument. When the tollgate review currently foreseen in December 2015 will be completed, PSI plans to have another ODIN instrument scientist in place. This person will be in charge of delivering the agreed upon contribution of the project in the consortium.

The main part of the Swiss in-kind contribution is the beam extraction and transport system. The initial design of this system was provided by the former partner of this project HZB and was slightly adapted by ESS and TUM, before it eventually became part of the Swiss contribution. This system can be roughly divided into three interconnected systems: the extraction system, the transport system and the conditioning system in the instrumental cave.

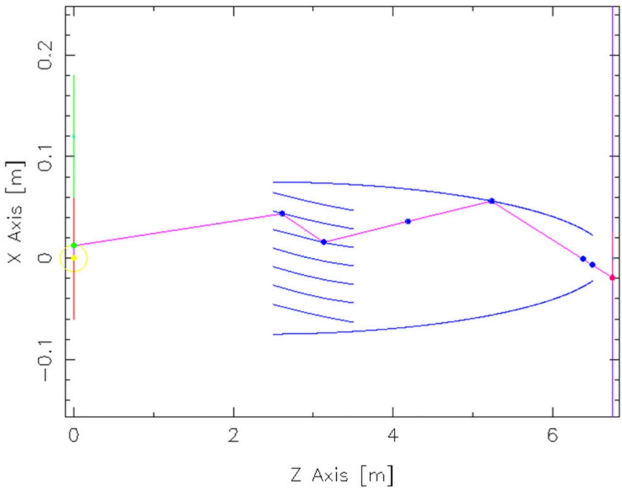

Figure 4: McStas output of the newly designed component for the bi-spectral extraction system. In the figure, the elliptical feeder contains in itself the pseudo-curved mirror for the extraction of the neutrons from the cold moderator (in green).

The extraction system is a neutron guide which is located in the source monolith, well within the heavy shielding that constitutes with the target and moderators the heart of the facility. In this heavily irradiated environment, the neutrons are generated and must be safely extracted and delivered to the instruments. This is a particularly sensitive area, where access will be almost impossible after the source becomes operational. Hence, any problems occurring in this region are likely to result in an underperforming instrument for a substantial duration before any actions can be taken to fix it. For ODIN in particular, this will be the place where a bi-spectral extraction system will be installed [17] (Fig. 4). Due to the peculiar geometry of the moderators, it will be possible to point the instrument towards the thermal moderator and, thanks to a series of carefully placed neutron supermirrors, extract also a cold neutron beam from the cold moderator. This is by no means a standard configuration for an instrument in general, and for an imaging station in particular. The simulations performed at PSI and the construction, that is foreseen to be accomplished by Swiss Neutronics, will need to be of the highest precision in order to avoid severe intensity and spectral modulations at the detector position 60m downstream of the source.

Downstream of the extraction system, the second part of the guide system will transport the neutrons to the pinhole configuration required for imaging. The current baseline model consists of an elliptical section (Fig. 5) where the beam cross section is expanded for an easier transport by the long straight (possibly tapering) neutron guide which will end in a focusing elliptical mirror that will focus the beam to the pinhole aperture just before the cave entrance. This is necessary as the full guide system requires a first focal spot between the pulse shaping choppers, in order

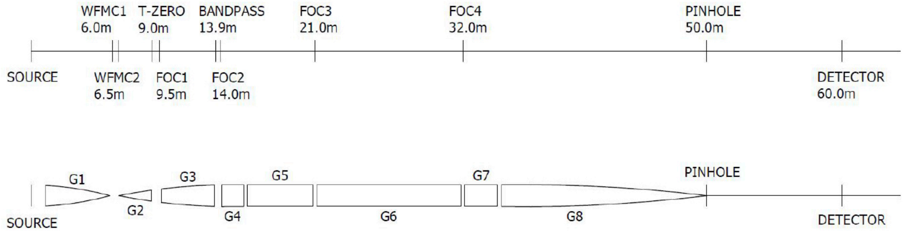

Figure 5: First layout of the baseline model for the neutron transport system of ODIN. G1 is the bi-spectral feeder. G2 and G3 are the elliptical expansion part of the ballistic guide. G4, G5, G6 and G7 are the straight sections. G8 is the guide that focuses the neutrons at the pinhole. 10 meters after the pinhole, the detector will be placed. All the gaps between guides are to house the required choppers.

to enable precise chopping for higher resolution modes.

This design proved very successful in the simulations, but recently the design of the moderators was changed from the previous height of 12 cm to just 6 cm. This will have an impact on the design and simulations are already running to re-optimize the whole transport system to this new boundary condition. The design of the transport system must also be part of a feedback loop between PSI and TUM for at least two reasons. From the radiation background point of view, the choice of a straight line-of-sight beamline like the current baseline model has an impact on the amount of shielding required and can even be impossible depending on the ESS regulations on radiation safety and budgetary boundary conditions. However, simulations of a transport system loosing line of sight have always been and are still part of the ODIN guide simulations in order to mitigate such risks from the beginning by having at least one alternative solution ready. In the past, hese have shown that a straight beamline will have a clear advantage in the homogeneity of the illumination of the FoV [18], which is of significant importance for imaging as pointed out earlier. In addition to that, the physical cross section of the beam at the positions of the choppers has a profound impact on the potential of spurious neutron contamination in the ToF frames. A big cross section results, in fact, in a longer full closing time of the guide by the choppers, which in turn can lead to neutron cross talk between separate time frames of the Wavelength Frame Multiplication (WFM) system. A constant communication with the scientists working on the chopper system will be the pre-requisite for a successful instrument and is in any case indispensable for the integration of the whole system.

The second big portion of the Swiss in-kind contribution to ODIN will be the cave interior, including the final beam shaping and pinhole system. Everything that will go inside the cave will be designed and built within the Swiss work package (Fig. 6). This includes for now means for the exchangeable mode configurations (polarized, gratings, x-rays, SEMSANS etc.), as the system design is required to be prepared for such and potentially other

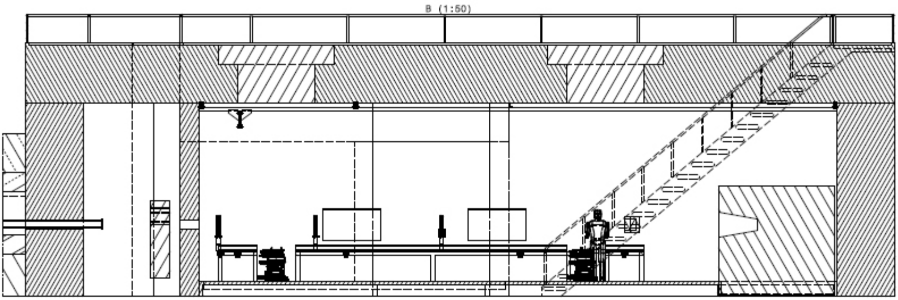

Figure 6: Preliminary CAD drawing of the experimental hutch. The design is not still definitive, but the general size and look will be similar to those represented in this figure.

systems later on. The interior also includes all the motorized stages to remotely move and align samples and detectors, the conventional and high resolution white beam detector system and their integration within the ESS infrastructure. This will be of course the heart of the instrument, where the day-to-day experiment work will be performed and it must be designed in such a way as to be the most flexible and user friendly as possible, yet allowing for future upgrades and changes. Since ESS is being built from the ground up, there is the possibility to design the endstation without compromises, profiting from the very long experience of user support and scientific excellence of PSI. Regarding the standard detector suite choice, a review has already been made available for an overview of the requirements and the state-of-the-art in this field [19].

Finally, PSI will have responsibility in yet another project that, while not strictly part of the ODIN project, will feature ESS' flagship imaging beamline as one of the main stakeholders: the imaging data management and analysis. This project aims to involve neutron imaging instruments all over the world in order to develop a common open-source platform of software to treat the imaging data in a uniform fashion. This user-oriented project will be beneficial to all the instruments at ESS that offer imaging capabilities, and of course in particular to ODIN which will be both the benchmark for this software and the main recipient of the advances in this field.

CONCLUSION

ODIN will be an imaging instrument that will unlock opportunities in neutron imaging never available before. The European effort to build the strongest neutron source ever built will take profit by Swiss scientific excellence and by PSI multi-year experience in running SINQ, one of the most intense spallation source to date and in neutron imaging. The fruits of this effort will be seen in at least four years, but the work is to be commenced immediately.

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Announcements

SGN/SSDN MEMBERS

Presently the SGN has 199 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. The coordinates are as follows: 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: http://www.psi.ch/info/facility-news

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: **November 15, 2015**

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 ILL

To look for open positions at ILL, please have a look at the following webpage of ILL: http://www.ill.eu/careers

PHD POSITIONS AT ILL

The PhD program of the Institut Laue-Langevin, ILL, is open to researchers in Switzerland. The contact person at ILL is Anne-Claire Dupuis (PhD@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 2015

Date/Location:	*September 2, 2015, ECNS Conference, Zaragoza, Spain*
Start:	*14:00*
End:	*15:00*
Participants:	*12 members of the society, 13 non-members*

1. WELCOME

The president of the SGN/SSDN, Henrik Ronnow welcomes the participants to the general assembly 2015.

2. MINUTES OF THE GENERAL ASSEMBLY 2014

The minutes of the general assembly of the SGN/SSDN from 26.11.2014, published in Swiss Neutron News #45 are accepted without objections.

3. ANNUAL REPORT OF THE CHAIRMAN

H. Ronnow reports on the activities of the SGN/SSDN in the year 2014:

a) The second Young Scientist Prize of the SGN/SSDN sponsored by Swiss Neutronics has been awarded to Dr. Jonas Okkels Birk.
b) As of Nov. 2013, the SGN has tax charitable status. The membership fees and donations are tax deductible.
c) One issue of Swiss Neutron News has appeared in March 2015, a further issue will appear in autumn 2015.
d) The SGN/SSDN has presently 199 members.

4. REPORT OF THE TREASURER

The annual balance sheet 2014 is presented:

Assets SGN/SSDN on 1.1.2014: **SFr 4011.54**

	Revenues [SFr]	Expenses [SFr]
Membership-fees (cash box)	80.00	
Membership-fees (postal check acc.)	575.66	
Donations (cash box)	1030.00	
Interest	1.90	
Expenses PC account		61.50
Tax solution		777.60
Total	1687.56	839.10

Net earnings 2014:	**SFr 848.46**	

Balance sheet 2014:	**Assets [SFr]**	**Liabilities [SFr]**
Postal check account	4580.00	
Cash box	280.00	
Assets on 31.12.2014	**4860.00**	

5. REPORT OF THE AUDITORS

Bericht der Revisoren

Die Rechnungsrevisoren haben die Belege, die Abrechnungen und die Bilanz für das Jahr 2014 geprüft und für in Ordnung befunden!

26.1.14	[signature]	30.1.15	[signature]
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 2014. They have accepted it without objection. The participants therefore unanimously vote for a release of the SGN/SSDN board.

6. BUDGET 2016

H. Ronnow presents the following proposal for the budget 2016:

	Receipts [SFr]	Expenditures [SFr]
member fees	800.00	
interest	0.00	
welcome reception Zuoz 2016		600.00
fees PC account		50.00
Total	800.00	650.00
Total receipts 2016	150.00	

The participants accept the budget proposal unanimously.

7. ELECTION OF BOARD MEMBERS

The term of the SGN board, Prof. Henrik Ronnow (president), Dr. Michel Kenzelmann, Dr. Eleonora Livia Bove, Dr. Urs Gasser (secretary), ends in 2015 and, therefore, the board has to be renewed. All four board members volunteer to serve another term.

Henrik Ronnow is reelected unanimously as president. Michel Kenzelmann is reelected unanimously as board member. Eleonora Livia Bove is reelected unanimously as board member. Urs Gasser is reelected unanimously as board member and secretary.

The term of the newly elected board will end in 2018.

8. NEWS FROM ENSA (H. RONNOW)

a) Christiane Alba-Simionesco (LLB, France) is now the new chairperson of ENSA and Ferenc Mezei (ESS) has become the new vice-chairman.

b) As ESS is now being built, ENSA can focus on the long term development of the neutron landscape.

c) Concerning the future European neutron landscape including ESS, sacrifices at other neutron sources may have to be made when ESS becomes operational. Where and how such sacrifices could be made needs to be discussed. The input of all neutron users is welcome and should be communicated directly to ENSA or the national neutron scattering associations.

9. NEWS FROM ILL (CH. RÜEGG, COMMUNICATED BY H. RONNOW)

a) The future operation of the ILL research reactor is being discussed. The reactor fuel and the reactor cycles are in the focus of this discussion. In particular, the length of the cycles and the neutron flux during operation can be changed. For Switzerland, the maximum neutron flux is most interesting, as a very high neutron flux is most complementary to SINQ. Comments regarding the operation of ILL should be directed to Ch. Rüegg, the Swiss representative in the ILL Scientific Council.

b) The ENDURANCE program continues with a first round of high-priority projects. These include new sample environments, software projects, new neutron guides, the fission product prompt gamma-ray spectrometer FIPPS, the high-density ultra-cold neutron source SuperSUN, the white beam reflectometer RAINBOWS, and the polarized thermal time-of-flight spectrometer PANTHER.

c) 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 SINQ (CH. RÜEGG)

a) In 2014, SINQ has received 438 new proposals. The number of experiment days in 2014 (1965) was somewhat higher than in 2013 (1841). Accordingly, the number of visits in 2014 (962) was also higher than in 2013 (870).

b) About 50% of the beam time in 2014 was used by Swiss users. The largest Swiss user groups are PSI, EPFL, and ETH Zürich.

c) There are three running instrument upgrades: The extreme conditions spectrometer (CAMEA) upgrade of Rita-II is planned to become operational in 2017. The single-crystal diffractometer Trics will be replaced with the new diffractometer ZEBRA in 2016. On the ICON imaging beamline, the neutron imaging microscope upgrade (N-microscope) is being realized.

d) The major upgrade of the neutron guide system of SINQ is planned for 2019/2020. This is planned to include a focusing reflectometer (SELENE), an extreme conditions instrument for high fields and high pressure (Xtreme), and a SANS instrument optimized for small samples.

11. NEWS FROM ESS (CH. RÜEGG)

a) The European Spallation Source (ESS) is now under construction in Lund, Sweden, and is planned to become operational in 2019. Switzerland is among the 17 member countries and contributes 3.5% to the construction budget of 1.8B €.

b) ESS is planned to have 16 operational instruments by 2025. Switzerland is involved in six instrument projects: The Danish-Swiss extreme environments spectrometer CAMEA, the Swiss-Danish focusing reflectometer SELENE, the Danish-Swiss diffraction instrument HEIMDAL, and the German-Swiss neutron imaging beamline ODIN have been approved for the 'engineering design' phase. The Danish-Swiss proposal for a compact, chopped SANS was not accepted for the design phase, as this proposal has significant overlap with another SANS project. Switzerland is also involved in a proposal for a magnetic crystal diffractometer (MAGiC) together with France and Germany. This proposal has been recommended by the Scientific Advisory Committee of ESS.

12. YOUNG SCIENTIST PRIZE OF THE SGN 2015, SPONSORED BY SWISSNEUTRONICS

The 2015 Young Scientist Prize of the Swiss Neutron Scattering Society sponsored by SwissNeutronics is awarded to Dr. Jonas Okkels Birk for his outstanding work on neutron instrumentation in the CAMEA project for the European Spallation Source. The amount of the prize is CHF 1000 and is sponsored by SwissNeutronics. After the award ceremony, Jonas Okkels Birk presents his contribution to the CAMEA project in a 20 minute presentation.

U. Gasser
September 2015

Winner of the Young Scientist Prize 2015 of the Swiss Neutron Scattering Society, sponsored by SwissNeutronics

The Young Scientist Prize 2015 of the society is awarded to a young researcher for his outstanding achievements using neutron scattering in the framework of his PhD thesis. The prize is awarded at the European Neutron Scattering Conference 2015 in Zaragoza, Spain.

THE PRIZE IS AWARDED TO

Dr. Jonas Okkels Birk

in recognition of his outstanding work on neutron instrumentation in the CAMEA project for the European Spallation Source.

Young Scientist Prize 2016 of the Swiss Neutron Scattering Society, sponsored by SwissNeutronics

CALL FOR NOMINATIONS

The Swiss Neutron Scattering Society hereby announces the call for nominations for the 3rd Young Scientist Prize of the Swiss Neutron Scattering Society.

The prize will be awarded to a young Scientist in recognition of a notable scientific achievement in the form of a PhD thesis. The science should include the use of neutron scattering, and eligible nominees should have a clear affiliation with Swiss Neutron Scattering (be member of the Swiss Neutron Scattering Society, be based in Switzerland, or have conducted experiments at Swiss neutron facilities). The PhD must have been awarded within two years of the announcement of this Call. The prize amounts to 1'000 CHF and is sponsored by SwissNeutronics.

Nominations for the prize should be submitted to the Swiss Neutron Scattering Society, Dr. Urs Gasser: (Urs.Gasser@psi.ch). The deadline for nominations is January 31st, 2016. Nominations should include:

- A nomination letter including the motivation for the award
- A CV and publication list of the nominee
- Digital copy of the nominated work (PhD thesis)
- Letter documenting the acceptance of the nomination by the nominee
- Letters of support from authorities in the relevant field are accepted

Nominations for the prize will be treated confidentially. Nominations for the prize will be evaluated by a Selection Committee appointed by the board of the Swiss Neutron Scattering Society. The nominations will be acknowledged, but there will be no further communication.

Conferences

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

OCTOBER 2015

- Basic & Advanced Rietveld Refinement & Indexing Workshop, October 1-2, 2015, Newton Square, PA, USA
- Workshop on Neutron Imaging and Tomography, October 5-6, 2015, Evian Les Bains, France
- Imaging Workshop, October 5-6, 2015, Berlin, Germany
- JCNS Workshop 2015: Neutron Scattering on Nano-Structured Soft Matter: Synthetic- and Bio-Materials, October 5-8, 2015, Tutzing, Germany
- JDN 23: Les journées de la Diffusion Neutronique 23, October 5-8, 2015, Evian Les Bains, France
- MASR 2015: Medical Applications of Synchrotron Radiation, October 5-9, 2015, Grenoble, France
- 2nd International Conference on Rheology and Modeling of Materials, October 5-9, 2015, Lillafured, Hungary
- Powder diffraction of organic compounds, October 6-8, 2015, Frankfurt a. M., Germany
- 8th International Conference on Electromagnetic Processing of Materials, October 12-16, 2015, Cannes, France
- NMI3-II: General Assembly 2015, October 14-16, 2015, Copenhagen, Denmark
- Maud school on combined analysis October 19-23, 2015, Trento, Italy
- LiQ2015: Current frontiers on liquid-liquid interfaces, October 21-23, 2015, Grenoble, France
- IUMRS-ICAM2015, October 25-29, 2015, Jeju, Republic of Korea
- International Conference on Protein Engineering, October 26-28, 2015, Chicago, USA

NOVEMBER 2015

- BioCAT Advanced SAXS Training Course, November 2-5, 2015, Chicago IL, USA
- 3rd Euro-Mediterranean Conference on Materials and Renewable Energies. EMC-MRE-3, November 2-6, 2015, Marrakech, Morocco
- Third CCP4-OIST school: From data processing to structure refinement and beyond, November 2-7, 2015, Okinawa, Japan
- 5th Annual Niels Bohr International Academy Workshop on ESS Science: Condensed Matter Theory and Advanced Software, November 9-13, 2015, Copenhagen, Denmark
- 16th International Feofilov Symposium on spectroscopy of crystals, November 9-13, 2015, St Petersburg, Russia
- Jülich Soft Matter Days 2015, November 10-13, 2015, Bad Honnef, Germany
- Cristallographie Electronique, November 16-20, 2015, Villeneuve d'Ascq, France
- The 1st African Light Source Conference and Workshop, November 16-20, 2015, Grenoble, France
- In Situ Serial Crystallography Workshop, November 17-19, 2015, PSI Villigen, Switzerland
- Inelastic neutron scattering school, November 22-27, 2015, ANSTO near Sidney, Australia
- AOFSRR 2015 in conjunction with User Meeting 2015, November 25-27, 2015, Clayton, Victoria, Australia
- 2015 MRS Fall Meeting and Exhibit, November 29 - December 4, 2015, Boston, MA, USA

DECEMBER 2015

- Colloque RX & Matière 2015, December 1-4, 2015, Grenoble, France
- AsCA2015: The 13th Conference of the Asian Crystallographic Association, December 5-8, 2015, Kolkata, India
- 4th Nano Today Conference, December 6-10, 2015, Dubai, United Arab Emirates
- BESSY II - THz to Soft X-ray Workshop, December 7-8, 2015, Berlin, Germany
- Fan du LLB, December 7-10, 2015, Gif-sur-Yvette, France
- ECRISLA 2015. Module I: Crystallization, December 7-11, 2015, Florianopolis, Brazil
- NMBS workshop: New synchrotron radiation and optical techniques for nanoscale microscopy of biological systems: from single molecules to cells, December 9-10, 2015, Trieste, Italy
- RESONANCE workshop: Multicolor FEL pulses and coherent control on the attosecond time scale opening new science perspectives, December 10-11, 2015, Trieste, Italy
- ECRISLA 2015. Module II: Crystallography, December 14-18, 2015, Florianopolis, Brazil

JANUARY 2016

- BioXFEL STC 3rd Annual International Conference, January 13-15, 2016, San Juan, Puerto Rico
- SUM16: 11th SOLEIL Users' Meeting, January 21-22, 2016, SOLEIL, Palaiseau, France

FEBRUARY 2016

- MIIFED - IBF 2016: International Fusion Energy Days (MIIFED) combined with the ITER Business Forum, February 8-11, 2016, Monaco
- NACMP 2016: 3rd Conference on New Advances in Condensed Matter Physics, February 28 - March 1, 2016, Beijing, China

MARCH 2016

- 9th International Workshop on X-ray Radiation Damage to Biological Crystalline Samples, March 9-11, 2016, Lund, Sweden

MAY 2016

- High-Pressure Crystallography: Status Artis and Emerging Opportunities. 49th Erice Course, May 27 - June 5, 2016, Erice, Sicily, Italy

JUNE 2016

- EPDIC15: 15th European Powder Diffraction Conference, June 12-15, 2016, Bari, Italy

JULY 2016

- ICCBM-16: 16th International Conference on the Crystallization of Biological Macromolecules, July 3-7, 2016, Prague, Czech Republic

AUGUST 2016

- Neutron Powder Diffraction School 2016, August 22-26, 2016, Villigen, Switzerland
- ECM-30: European Crystallographic Meeting, August 28 - September 1, 2016, Basel, Switzerland
- EMC2016, August 28 - September 2, 2016, Lyon, France

SEPTEMBER 2016

- ISMC 2016: 4th International Soft Matter Conference, August 12-16, 2016, Grenoble. France

OCTOBER 2016

- MEDSI2016: Mechanical Engineering Design of Synchrotron Radiation Equipment and Instrumentation, October 2, 2016, Barcelona, Spain

JULY 2017

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

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