

**2nd Annual Report** (1/2 2001 – 31/1 2002)

<b>Contract N°</b>	<b>HPRI-CT-1999-40007</b>
<b>Start date of contract</b>	<b>1-Feb-2000</b>
<b>End date of contract</b>	<b>30-Apr-2003 extended without further funding to 31-Dec-2003</b>
<b>Network Title</b>	<b>THEMATIC NETWORK FOR NEUTRON AND MOUN BEAM SOURCES</b>
<b>Website address</b>	<a href="http://www.risoe.dk/afm/Neutron_Round_Table.htm">http://www.risoe.dk/afm/Neutron_Round_Table.htm</a>
<b>Name of Co-ordinator</b>	Kurt N. Clausen
<b>E-Mail address</b>	<a href="mailto:kurt.clausen@risoe.dk">kurt.clausen@risoe.dk</a>

**Partnership Summary**

Participant number (Co-ordinating partner as participant N°1)	Name of Participating Organisation	Name of Responsible Person	Role in network*
1	Risø National Laboratory (DK)	Kurt N. Clausen	OTHER
2	Orphee, LLB Saclay (FR) Laboratoire Léon Brillouin, CEA Saclay, France	Pierre Monceau	LSF-IHP
3	BER2, (BENSC), Berlin (DE), HMI-BENSC, Germany	Rainer Michaelsen	LSF-IHP
4	ISIS - Neutrons, CCLRC (GB) Rutherford Appleton Laboratory, UK	Uschi Steigenberger	LSF-IHP
5	ISIS - Muons, CCLRC (GB) Rutherford Appleton Laboratory, UK	Philip King	LSF-IHP
6	NFL, Studsvik, (SE) Studsvik Neutron Research Laboratory, Sweden	Robert McGreevy	LSF-IHP
7	ILL, (FR), Institut Laue-Langevin, France	Christian Vettier	LSF-OTH
8	Jülich, (DE), Institut für Festkörperforschung, Germany	Reiner Zorn	LSF-IHP
9	PSI, (SINQ), (CH) Laboratory for Neutron Scattering, Switzerland	Peter Allenspach	LSF-OTH
10	BNC, Budapest, (HU) Budapest Neutron Center, BNC, Hungary	Laszlo Rosta	LSF-TMR
11	ENSA, European Neutron Scattering Association, University of Leeds, UK	Robert Cywinski	SOC
12	Università di Firenze, (IT), Italia	Fabrizio Barocchi	USER
13	Interfacultair Reactor Instituut, (NL), The Netherlands	A.A. Van Well	USER
14	Universidad del País Vasco, (SP), Spain	Juan Colmenero	USER
15	Institut de Biologie Structurale CEA-CNRS, (FR), France	Joseph Zaccai	USER
16	TECHNI, Rutherford Appleton Laboratory, (UK)	Mike Johnson	OTHER
18	ESS - Project, Institut für Festkörperforschung, (DE), Germany	Dieter Richter	OTHER

Participant number (Co-ordinating partner as participant N°1)	Name of Participating Organisation	Name of Responsible Person	Role in network*
19	AUSTRON - Project, WEBCO Consulting, (AU), Austria	Helmut Weber	OTHER
20	FRM II - Munich Reactor project Technische Universität München, (DE), Germany	Winfried Petry	OTHER
21	Vesuvio, INFN Roma, (IT), Italy	Carla Andreani	OTHER
23	SCANS, Studsvik, (SE) Studsvik Neutron Research Laboratory, Sweden	Robert McGreevy	OTHER
24	ENPI, ILL Grenoble, (FR), France	Francis Tasset	OTHER

- \* LSF-IHP: a research infrastructure funded for access under the IHP Programme  
 LSF-TMR: a research infrastructure funded for access under the TMR Programme  
 LSF-OTH: a research infrastructure outside the IHP or TMR Programmes  
 USER: a research organisation representative of users of the facilities covered by the Round-Table  
 SOC: European scientific societies  
 IND: an industrial or commercial enterprise  
 OTHER: other types of participant

13 July 2002

Kurt N Clausen

## **1. Executive Summary (Database Report)**

The thematic network is focussed on the European aspect of the activities in the field of neutron and muon scattering.

The network manages the neutron round-table, which acts as the controlling body of the activities. The participants on the round-table are representatives from 1) European high and medium flux neutron and muon sources, 2) users of these facilities and 3) networks and other European initiatives in this field.

The network supports joint scientific and technical activities, which are focussed on:

- 1) improving the quality and quantity of access to neutron and muon beams.
- 2) widening the knowledge about the potential of neutron scattering.
- 3) enhancing co-ordination, collaboration and complementarity between neutron scattering centres.
- 4) building the scientific case and developing the neutron scattering instrumentation required to produce a credible European proposal for a next generation neutron source.
- 5) involving facilities and users in the new associated states in the activities above

The measures to achieve the objectives are co-ordination meetings, training of users by internationalisation of national training programmes, building networks between technical staff at the different facilities involved in the provision of sample environment for the users, supporting European wide workshops on topics related to the RTD projects, support workshops on the development of the scientific case for the next generation neutron and muon sources.

The close links between European neutron and muon scattering facilities and the close interaction with the user communities is a sign of success for the initiative.

## 2. General Meetings

Three general meetings have been held in this reporting period, whenever possible immediately following ENSA meetings – to economise on travel and maintain close links with the users. The standard agenda as described in the contract was followed, and in the list below only special topics are mentioned together with the decisions taken.

### 10-11 May 2001 at IFE, Kjeller, Norway

Main items beyond standard agenda:

- ENSA involvement in the round-table – round-table support was agreed.
- Principles for allocating round-table support from the FP5 programme discussed and agreed.
- The European Spallation Source Project – it was agreed to jointly apply for EU support

Full minutes available: [http://www.risoe.dk/afm/Neutron\\_Round\\_Table.htm](http://www.risoe.dk/afm/Neutron_Round_Table.htm)  
[http://www.risoe.dk/afm/external/kncl/Round\\_Table\\_previous\\_meetings/Oslo\\_2001/Minutes-Oslo-May-2001.pdf](http://www.risoe.dk/afm/external/kncl/Round_Table_previous_meetings/Oslo_2001/Minutes-Oslo-May-2001.pdf)

### 10 September 2001 at ICNS 2001, Munich, Germany (short meeting)

Main items beyond standard agenda:

- Evaluation of the ICNS meeting – excellent meeting with a huge attendance.
- Neutrons in the 6'th framework programme – first discussion of a common approach.

Full minutes available: [http://www.risoe.dk/afm/Neutron\\_Round\\_Table.htm](http://www.risoe.dk/afm/Neutron_Round_Table.htm)  
[http://www.risoe.dk/afm/external/kncl/Round\\_Table\\_previous\\_meetings/Munich\\_2001/Minutes-Munich-September-2001.pdf](http://www.risoe.dk/afm/external/kncl/Round_Table_previous_meetings/Munich_2001/Minutes-Munich-September-2001.pdf)

### 14 December 2001, University of Leeds, UK

Main items beyond standard agenda:

- Neutrons in FP6 – it was decided to apply for a joint infrastructure Initiative and form a group to prepare a common programme.
- The ESS presentation and the neutron users meeting in May 2002 - it was decided to have RTD network meetings and user meetings for the Access contracts as satellite meetings.

Full minutes available: [http://www.risoe.dk/afm/Neutron\\_Round\\_Table.htm](http://www.risoe.dk/afm/Neutron_Round_Table.htm)  
[http://www.risoe.dk/afm/external/kncl/Round\\_Table\\_previous\\_meetings/Leeds\\_2001/Minutes-Leeds-Dec-2001.htm](http://www.risoe.dk/afm/external/kncl/Round_Table_previous_meetings/Leeds_2001/Minutes-Leeds-Dec-2001.htm)

### **3. Work progress of the Joint Scientific/Technological Activities or Studies**

The round-table operates in two different modes. The round-table initiates and co-ordinates activities such as round-table meetings. The round-table act as a funding body and provide partial support for activities falling within the objectives of the round-table. The latter activities are arranged by an expert in the specific field.

The activities fall under the main headlines:

- 1) Technical networking, co-ordination of instrument development and spreading of new technologies and methods.
- 2) Training of new users
- 3) Updating the case for neutron and muon scattering and neutron and muon sources.

A summary of the activities is given below. The compilation of the full reports from the activities can be found in the appendix.

#### **Sample Environment Workshop "New Techniques and Developments for Sample Environment at Neutron Scattering Research Facilities, 4-6 April 2001, PSI, Switzerland.**

27 scientists and engineers from neutron scattering centres in Germany, France, Great Britain, Switzerland, Russia, U.S.A. and Canada, mostly working on sample environment, came together for a 2 days workshop. The aim of the workshop was to inform on the status of sample environment at the different neutron research centres and to exchange ideas on future developments and collaborations among them. This kind of meeting has become an annual event and has had a positive impact on both the variety and the quality of the service provided to users.

#### **PSD Workshop: Position-Sensitive Neutron Detectors – Status and Perspectives 28-30 June 2001, Berlin**

The objectives were to define the detector requirements for the future sources in comparison with the current most advanced sources ILL and ISIS, to deliver a detailed assessment of the capabilities and limitations of the presently used and of novel detector types and to summarise requirements and solutions for adequate data acquisition strategies. The outcome is available online at <http://www.hmi.de/bensc/psnd2001>

#### **VITESS Workshop, 25 – 27 June 2001, Berlin**

With the appearance of more and more advanced neutron instruments, computer simulation has become a mandatory element of instrument design and data evaluation. Two complementary software packages – a menu driven program with a graphical user interface (VITESS) and a command based package (McStas) are widely used by the user community. The development of these two packages are co-ordinated and in close collaboration. In this reporting period a co-ordination meeting with 30 participants met in Berlin to learn about new features and to suggest future developments of Vitess.

#### **Workshop: Moderator Concepts for Spallation Neutron Sources, 12 - 14 March 2001, HMI, Berlin**

To achieve the best possible combination of instruments and moderators for future neutron sources like ESS, an international workshop was recently organised by HMI, the ESS lead laboratory for instrumentation.

The Proceedings of the workshop will appear in a future issue of J. of Neutron Research. A complete set of all presentations given at the workshop has been published as ESS Report ESS 114-01-T, Mai 2001, ISSN 1433- 559X "Moderator Concepts and Optimization for Spallation Neutron Sources", Volume 1 and 2 compiled by T. Gutberlet.

**Training of new users to make optimal use of the facilities being offered access to through the FP5 programme:**

Support for participation of non-national newcomers to neutron scattering in training courses on neutron scattering were given for the following 3 schools:

Jülich summer school 18-28 September 2001, Jülich: Support of 12 students to participate in the hands on Laboratory Course Neutron Scattering. (39 participants in total)

Oxford summer school 27 August - 6 September 2001. Support of 7 students to participate in the Oxford (ISIS) neutron scattering school (31 participants in total)

BNC Neutron Scattering School 7-12 December 2001, Budapest. Support of 18 students to participate in the Central European Course and Hands-on-Training on Neutron Scattering (24 participants in total)

A CD-rom about neutrons, to be used for training of students is being prepared in French by Alain FILHOL. The Neutron Round Table has supported the translation to English. The CD will be published later this year.

**Workshop: Scientific Trends in Condensed Matter Research and Instrumentation Opportunities at ESS– Engelberg Switzerland 3-5 May 2001**

The ESS Science Advisory Committee (SAC) and ENSA organised this meeting, where the future design of the ESS was decided, on the basis of an assessment of the scientific trends and potential facility (source, instruments and software) development. A novel design, which will make the ESS a step beyond any other facility Worldwide was the outcome.

Progress report: ESS – SAC/ENSA Workshop on “Scientific Trends in Condensed Matter Research and Instrumentation Opportunities at ESS” available on the web:

(<http://www.ess-europe.de> under “Documentation”).

[http://www.ess-europe.de/documentation/ESS\\_SAC\\_ENSA\\_2001.pdf](http://www.ess-europe.de/documentation/ESS_SAC_ENSA_2001.pdf)

**Workshop: Towards a European High Magnetic Field  $\mu$ SR Facility. 15-16 January 2002, Villigen PSI**

The range of magnetic fields currently available at  $\mu$ SR facilities in Europe (max. 5 T at PSI) represents a considerable limitation on the information that can be derived from  $\mu$ SR measurements under magnetic fields. 41 leading scientists meet to discuss the future development in this field. At the workshop it was decided the a detailed scientific case should be worked out by the contributors to the workshop, and that a project group should start to work on a technical proposal for its realisation.

**Workshop: “DYPROSO (Dynamical Properties of Solids) XXVIII” Kerkrade, Netherlands 16–20 September 2001**

One of the strong holds of neutron scattering is the ability to probe the dynamics of matter over a very wide range of timescales. The workshop Dyproso XXVIII was the twenty-eighth in a series of conferences with the topic „Dynamical Properties of Solids “.For Dyproso XXVIII „Soft and Disordered Matter“ was chosen as the topic. Altogether 71 participants from fourteen countries attended the conference. One of the objectives of such an event is to follow the development in the field and use this as a guidance to the future development of instrumentation at our neutron facilities.

**Workshop entitled "Materials for Spin Electronics - Neutrons as a Fundamental Probe." Abingdon 14th and 15th of January, 2002**

There is currently an enormous worldwide drive to develop devices where the spin of the electron is used to store or process information, either in addition to or instead of the charge. Although many devices designs have been put forward, finding materials with which to implement them is a significant experimental challenge. There are two main areas of activity - developing heterostructures with magnetic components, such as spin-

valves and magnetic tunnel junctions, and also the search for materials with desirable properties such as half-metallicity.

Neutrons are a natural probe of these materials – the aim of the meeting was to demonstrate how neutrons can play an important role in this billion Euro business area. Participants were from France, Germany, Italy, Poland and the United States as well as from the UK (in total 25).

*The supported activities were in line with both the objectives and the planned work schedule for the reporting period.*

**The planned activities for the next 12 month period are:**

2 Round-table meetings: Roskilde June 2002 and Budapest October 2002.

Technical co-ordination - 2 Meetings : Sample Environment and Instrument Simulation

Support for 3-4 training courses: A Muon scattering training course at PSI/ISIS, neutron training courses at HMI and Juelich.

Support of 6 meetings and workshops: The ESS presentation, a Catalysis Workshop at ISIS, a Reflectometry workshop at ILL, a triple axis development Workshop at ILL, a polarized neutron workshop at Juelich and QENS2002 at HMI.

#### 4. **List of deliverables**

The deliverables specified in appendix I of the contract are given below, together with the status and comments. In general the programme directly follows the objectives.

Deliverables according to contract	Status
<p><b>Managing the round-table:</b></p> <p>4 round-table meetings (about 1 meeting every 9 month)</p> <p>1 or more reports in response to questions from funding agencies or large projects on questions of importance to the whole field of neutron scattering (in collaboration with ENSA)</p>	<p>Oslo May 2001, Leeds Dec. 2001</p> <p>Report on ESS – SAC/ENSA Workshop on “Scientific Trends in Condensed Matter Research and Instrumentation Opportunities at ESS”</p>
<p><b>Co-ordination of instrument development and spreading of new technologies and methods:</b></p> <p>1 annual meeting of the technical staff responsible for ancillary equipment at the facilities, arranged on a rotating basis of the different facilities.</p> <p>2 small workshops or training courses per year aimed at the spreading of knowledge acquired from the RTD networks or other joint efforts on the development of instrument components or methods.</p>	<p>Sample environment workshop - PSI</p> <p>Vitess Workshop</p> <p>PSD workshop</p>
<p><b>Training of new users:</b></p> <p>Support for 20-30 non-national young scientists' participation in 1-3 national summer schools per year.</p> <p>1 hands on training course for young scientists at the next European conference on neutron scattering.</p> <p>Collecting lecture notes and educational material on the web in order to make these available to university lecturers all over Europe. (This can in some cases mean translation into different languages)</p>	<p>Oxford summer school (7) Jülich summer school (12) Budapest summer school (18)</p> <p>No conference this period Planned for ECNS 2003</p> <p>CD-rom on neutrons (finished late 2002)</p> <p>Material under preparation, but responsible person left for a new job before the job was finished. Solution being sought.</p>
<p><b>Updating the case for neutron scattering and neutron sources:</b></p> <p>1-3 workshops per year on novel ideas or instrumentation important for the future of the field. During the first 2 years of the contract the workshops will be small (3 per year) and focused on specific topics.</p> <p>In the last 14 months, 2 larger meetings are</p>	<p>DYPROCO workshop Spin electronics workshop Moderator workshop Towards a European High field Muon facility</p>

<p>planned. These meetings should give a broader overview of the field and lead to the final delivery, which is:                  One report on recommendations for the development of present sources and the planning of new sources in Europe (delivered towards the end of the contract and prepared in collaboration with ENSA)</p>	<p>ESS SAC workshop - Engelberg                   In preparation – to be published May 2002</p>
<p>For all tasks the progress should be published and accessible to the community through the round-table home page on the web.</p>	<p>Improvements needed.</p>

## 5. **Exploitation and dissemination of results**

The ESS activities have had a direct impact on the proposed design for the facility, and especially the suggestion to change the concept from two short pulse 10 Hz and 50 Hz (1.4  $\mu$ s) target stations to a long pulse (2 ms) 17 Hz and a short pulse 50 Hz station.

The supported workshops will in general have published proceedings.

No patents or patent applications have been filed.

### **Publications:**

Progress report: ESS – SAC/ENSA Workshop on “Scientific Trends in Condensed Matter Research and Instrumentation Opportunities at ESS” Edited by Dieter Richter (May 2001) (<http://www.ess-europe.de> under “Documentation”).

ESS Report ESS 114-01-T, Mai 2001, ISSN 1433- 559X "Moderator Concepts and Optimization for Spallation Neutron Sources", compiled by T. Gutberlet.

ESS Report ESS 114-01-T, Mai 2001, ISSN 1433- 559X "Moderator Concepts and Optimization for Spallation Neutron Sources", compiled by T. Gutberlet.

ESS Report 04-127-I April 2002 Proceedings on International workshop on “Position Sensitive Neutron Detectors – Status and perspectives” **VOLUME1**. Compiled by F. Mezei, B. Gebauer, T Gutberlet and T. Wilpert.  
ISSN 1433-559X

ESS Report 04-127-I April 2002 Proceedings on International workshop on “Position Sensitive Neutron Detectors – Status and perspectives” **VOLUME2**. Compiled by F. Mezei, B. Gebauer, T Gutberlet and T. Wilpert.  
ISSN 1433-559X

In a couple of these publications Acknowledgement for support from the *European Community - Access to Research Infrastructure action of the Improving Human Potential Programme* has unfortunately only been referenced as Support from the Neutron round-table.

## 6. Management and coordination aspects

The network co-ordinator is the chairman of the general meetings. He is supported by a part time secretary and the infrastructure at Risø national laboratory. Information between the partners are mainly by e-mail and via the round-table web page, which is maintained and updated by the co-ordinator and Bente Lebech from Risø National Laboratory.

[http://www.risoe.dk/afm/Neutron\\_Round\\_Table.htm](http://www.risoe.dk/afm/Neutron_Round_Table.htm)

The different activities supported by the network are in general carried out by scientists from the participating institutions. For specific activities the round-table forms groups or nominates individual members or groups to look into topics of interest to the round-table.

There are no problems with participants not making their contribution to the various activities.

**Whereas the activities have been following the original goals and milestones, the distribution of the expenses over cost categories do not.**

In the first approved cost statement 4 activities (see table below) were included as other specific cost instead of travel and per diem:

<b>COST STATEMENT 1 – CORRECTIONS TO BE MADE</b>	
McStas workshop Risø, 24-27 January, 2001	6.709,47 €
Neutron Spin Echo workshop Berlin, 16-17 October, 2000	4.012,25 €
Protons in Protein, ILL 25-27 January, 2001	4.700,00 €
5th round-table meeting Jülich 13-14 November 2000,	2.507,07 €
<b>Total to be moved from cost category <i>Other specific cost</i> to <i>travel and subsistence</i></b>	<b>17.928,79 €</b>

The distribution over cost categories with the suggested changes due to the faulty classification in cost statement 1 and the present 2<sup>nd</sup> cost statement are as follows:

	Personnel	Travel and subsistence	Other cost	Overhead	Total
<b>Original budget</b>	<b>180.000,00</b>	<b>183.000,00</b>	<b>12.000,00</b>	<b>75.000,00</b>	<b>450.000,00</b>
1 cost statement as submitted	6.111,14	2.771,57	29.780,08	7.732,56	46.395,35
<b>Correction to 1 cost statement</b>		<b>17.928,79</b>	<b>-17.928,79</b>	<b>0,00</b>	<b>0,00</b>
<b>1 cost statement final</b>	<b>6.111,14</b>	<b>20.700,36</b>	<b>11.851,29</b>	<b>7.732,56</b>	<b>46.395,35</b>
2 cost statement as submitted	12.407,11	96.020,59	16.239,73	24.933,49	149.600,92
Correction to 2 cost statement				0,00	0,00
<b>2 cost statement final</b>	<b>12.407,11</b>	<b>96.020,59</b>	<b>16.239,73</b>	<b>24.933,49</b>	<b>149.600,92</b>

Attribution to all cost items can be found in the details in the appendix.

In the proposal it was suggested to use round-table funding to support staff being exchanged for short periods between facilities – in order to spread good practices and knowledge of technical solutions developed in the RTD networks. Experience has however shown that it is much more efficient to achieve this goal through small workshops on sample environment and RTD activities. The consequence of this is that the personnel expenses will be less than predicted, whereas the Travel and subsistence and other cost will increase accordingly.

**The round-table need advice from DGXII on how these changes can be implemented.**