

WP2

Dissemination & Outreach

WP4

NaMES - Schools

Inês Crespo
Information Manager

WP2

- *Task 2.1 Internet portal as internal and external communication tool*
- *Task 2.2 Scientific and public outreach*
- *Task 2.3 Developing the Muon user community*

WP4

- *Task 4.1 Regular exchange of information*
- *Tasks 4.2-15 – Schools*

■ nmi3.eu

~2700 visitors
per month

■ Videos

19 videos



■ e-newsletter

30
~1 per month



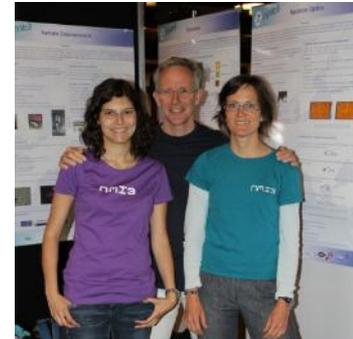
Neutron News

15 ads



Notiziario

Events



NMI3 on EC news service

Interesting?

CORDISwire
HORIZON

- in different languages
- taken by international sites

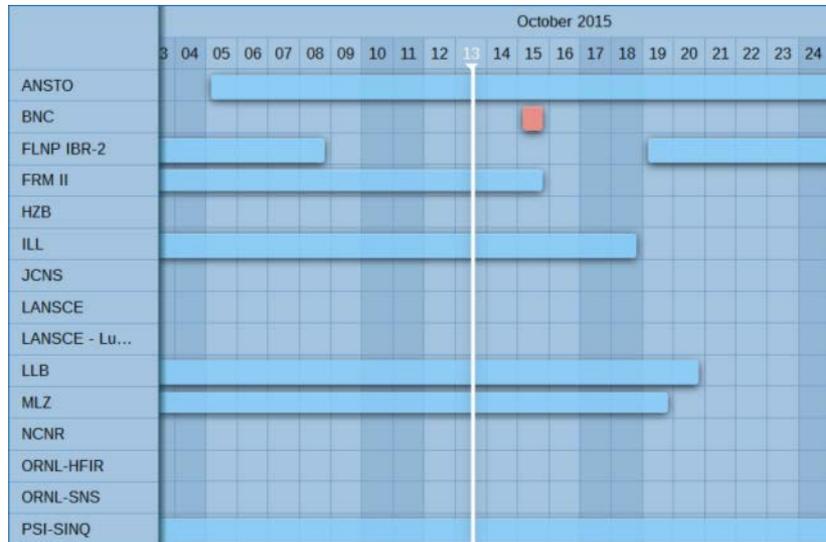
- A taste of what's to come? Flavour-changing gum gives disease early warning, *Horizon*
- Muons help understand mechanism behind hydrogen storage
 - Copied from *CORDIS* to <http://fuelcellsworks.com/>
 - Linked at <http://www.renewanews.com/>
- Neutrons help visualising materials, *Phys.org* – including our video
- Europe readying world's brightest neutron beam, *Horizon*
- High-tech solution for tackling brain disease, *CORDIS News* -> in 3 different languages
 - Taken by *Physics.org*, *FP7 Ireland*, *FP7 Welcome Europe* blog, several “news aggregator” in Italian, French, Greek, Polish, Lithuanian, etc, and linked on *The European Brain Council's Weekly Ext. Env. Update*.
- Training Europe's future scientists in atomic scale research, *CORDIS News*

~1300 visitors
per month

50 contributors

4 PR meetings

Search Jobs Press contacts Contact



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12.10.2015
ISIS, UK

Brand new opportunity for international Post-Docs at STFC and Diamond

STFC and Diamond Light Source are offering 36 positions to post-doctoral researchers over the next five years as part of the brand new Rutherford International Fellowship Programme.

[read more](#)

07.10.2015

From NeutronSources

The birth of time-of-flight neutron powder diffraction at pulsed sources



There is a new article on our History section. You can now learn about the birth of time-of-flight neutron powder diffraction at pulsed sources by [tzabela M. Sosnowska](#).

[read more](#)

Job openings

[Jobs RSS](#)

In this page you can find the latest job openings in the neutron centres worldwide as well as direct links to the institutions' job webpages. We collect many of the posts from the [neutron mailing list](#). If there is a vacancy in your facility, don't hesitate to send us the call at news@neutronsources.org. You may use the template provided below.

13. October 2015 - University of Maryland, College Park

Faculty Assistant

Engineer – Neutron Optics

07. October 2015 - Helmholtz Zentrum Berlin für Materialien und Energie (HZB)

Triple Axis Spectrometer FLEXX - Instrument Scientist

Triple Axis Spectrometer FLEXX - Instrument Scientist

- Discoveries that changed the world: James Chadwick (1891-1974) and Lise Meitner (1878 – 1968)
- The Early History of Neutron Stress Measurements
- Fifty years of neutron diffraction: the advent of neutron scattering
- On fifty years of the neutron discovery - special issue



Muons Outreach

Developing the Muon User Community was an important part of our work

Focus was on High Field μ SR,
an area of facility development

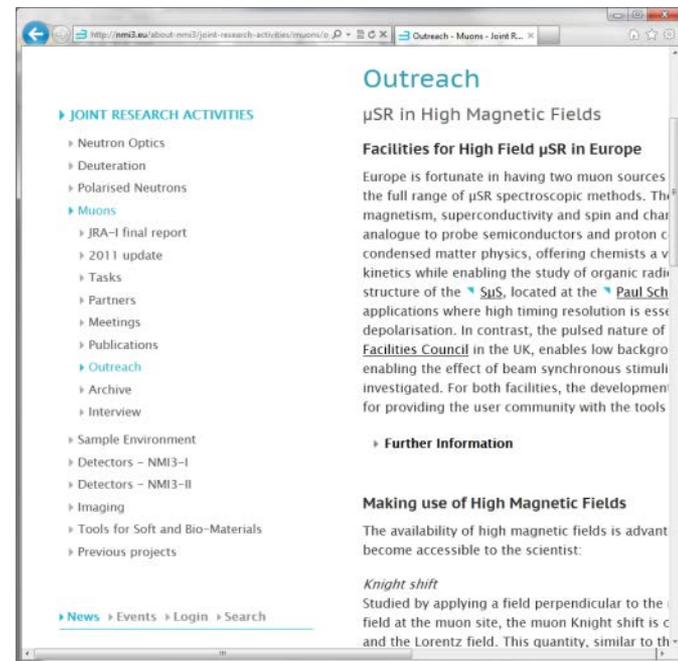


What we've done ...

Publicising the High Field facilities at PSI and ISIS ...

A Website...

Making scientists aware of the facilities, and applications of High Field μ SR



Publicity material ... applications of High Field μ SR

Avoided
Level
Crossing

High
Resolution
 μ SR

What can LCR tell us about free radicals?

Structure

The structure of a free radical can be inferred from the muon and nuclear hyperfine couplings.

^{13}C hyperfine couplings can be determined from the positions of the resonances. They indicate that the muon is located on a carbon atom on a side chain substituted at the tubular sites.

P.W. Perle et al., Chem. Phys. Lett. 348 (1995) 90

Molecular dynamics

The resonance line shape provides information about molecular dynamics in the solid state.

The linewidth indicates that muon radical is rapidly rotating around its axis parallel to C3-C5.

M. Accorzi et al., Phys. Lett. A 179 (1996) 310; J. Borner et al., Chem. Soc. Rev. 27 (1998) 337

Reaction rates

Radical reaction rates can be measured from the broadening of resonances, as a function of reactant concentration.

Reaction of cyclohexanone radical with peroxymyric acid.

J. Borner et al., Physica 8 334-375 (2004) 377

Muon LCR: the basic idea

Once implanted inside a material, muons interact with their local atomic environment. The interaction can be particularly strong when an energy level in the muon system matches one within the environment. The "speaking terms", and the can strongly affect the muon's behaviour.

Such resonances – called level crossing resonances, LCR (or sometimes, "avoided level crossing resonances") – between the muons and their environment can be produced by changing the applied magnetic field in a muon experiment. The resonances can be detected by observing the muon polarisation: they are seen as a dip in the polarisation as the applied field is changed. Observation of such resonances gives an additional information about the muon's atomic environment.

High resolution muon spectroscopy: the basic idea

Once implanted inside a material, muons interact with their local atomic environment. In some cases the interaction can be strong, and fast timing polarisation is required to follow the evolution of the muon spin polarization. In these cases the magnetic systems, large internal fields give rise to fast precession frequencies, while broad internal field distributions will lead to a rapid decay of the muon polarisation. In chemical systems, the measurement of detailed spectroscopic information requires large precession fields which, in turn, give rise to energy level splittings of the order of hundreds of MHz.

The beam structure of the $5\mu\text{s}$, located at PSI, Switzerland is implanted into the sample one by one, allowing accurate timing of the interval between muon arrival and the detection of the detector position. With careful instrument design and specialist detection technologies, timing resolutions of $\sim 10\text{ps}$ are possible.

This is illustrated by the transverse field experiment, where fast applied perpendicular to the muon external magnetic field precession frequencies of $\sim 1.3\text{GHz}$ are measured. In this case the muon response and the corresponding shape of the Fourier transform reflects the microscopic field distribution sensed by the muon.

Example applications of High Resolution muSR

Superconductivity

The vortex state induced in a type-II superconductor when a strong magnetic field is applied can be studied using muons. The technique probes the magnetic field on a length scale much shorter than the inter-vortex distance, enabling information about the internal vortex structure and interactions to be obtained.

Field distribution of a vortex lattice formed in $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ at 1 K and 20 T external field of 100 T.

Adrian G. Edwards et al., Phys. Rev. Lett. 80 (1998) 2055

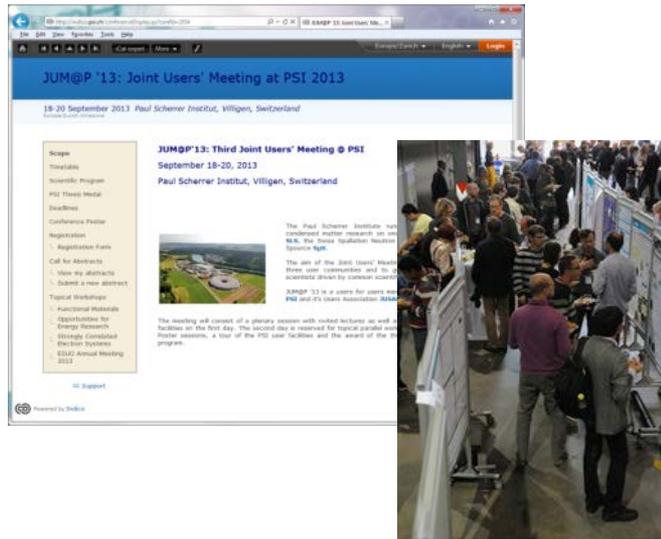
Muons are now routinely used to determine characteristic length scales, such as the magnetic penetration depth and coherence length, and the muon technique enables vortex lattice topology to be investigated. Muons are also playing a key role in the search for experimental evidence for exotic vortex states. For example, a change in the spatial field distribution around the vortex cores has been predicted for clean superconductors at low temperatures and at fields close to the upper critical field. Measurements capable of extended temperature and field measurements promise to bring a new insight to these studies.

Models for conventional (MFI) and exotic (right vortex states) can be investigated using muon spectroscopy.

A. Honecker et al., Phys. Rev. Lett. 93 (2004) 2570

Themed Science Workshops ...

Function Materials



Held at PSI (part of JUM@P '13) September 2013

Soft Matter, Excitations and Muon Induced Perturbations



New Application of μ SR: Studies of Soft Matter and Spectroscopy of Excited States

** Registration for the meeting has now closed, but it may still be possible to attend the meeting. Please contact Steve Cottrell if interested in attending. **

3-4 September, Queen Mary, University of London

A workshop is planned with a focus on introducing new applications of μ SR.

Sessions are anticipated discussing measurements of soft matter systems and the development of novel experimental methods for studying excited states. The programme will also include time for discussion of the phenomena of Muon induced perturbations and their impact on the muon experiment.

There will be an opportunity for students to contribute to the programme; abstracts are invited at the time of registration.

An up to date programme and abstract book for the meeting will be sent by email. The meeting instructions including directions can be found here, <http://royal.com/MuSR2013Meeting@actions>

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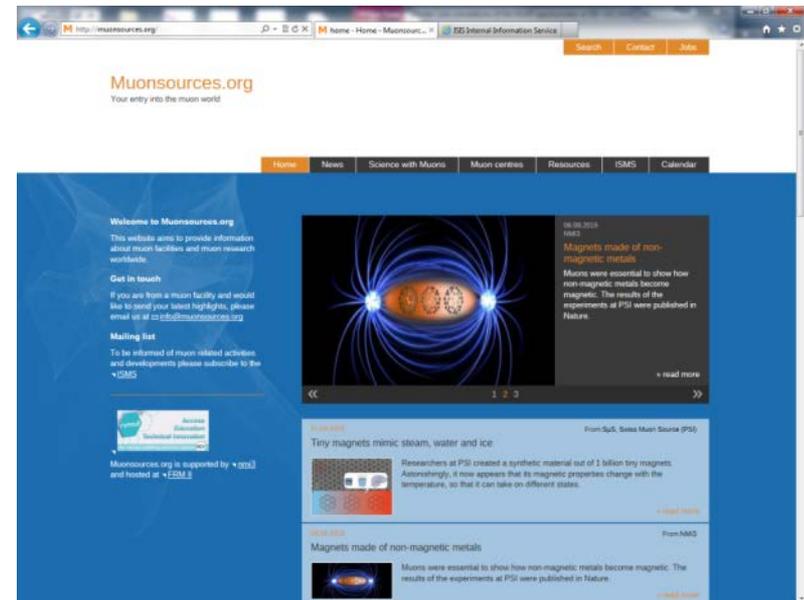


Held at Queen Mary University of London, September 2015

Hosted by Alan Drew, ERC grant holder developing laser stimulated μ SR at ISIS

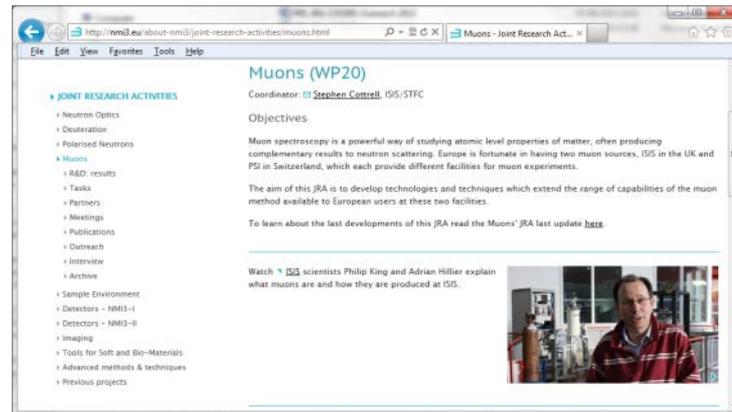
Developing muonsources.org ...

- A Portal for Scientists Using Muon Techniques
- A companion website to neutronsources.org



Watch our page on the NMI3 website...

<http://nmi3.eu> ...



where we are posting project news and results

D2.1	Newsletter summarizing the work in progress	3	8.00	O	PU	✓	6
D2.2	Newsletter summarizing the work in progress	3	8.00	O	PU	✓	18
D2.3	Newsletter summarizing the work in progress	3	8.00	O	PU	✓	30
D2.4	Newsletter summarizing the work in progress	3	8.00	O	PU		42
D2.5	New Internet portal finished	3	15.00	O	PU	✓	24
D2.6	Advertising material for conferences and journal advertising	3	4.00	O	PU	✓	36
D2.7	Evaluation of possible presentations on conferences, workshops	2	1.00	R	PU	✓	6
D2.8	Brochure for target group 1	2	1.00	O	PU	✓	16
D2.9	Report on outreach activities	2	1.00	R	PU	✓	12
D2.10	Report on outreach activities	2	1.00	R	PU	✓	24
D2.11	Report on outreach activities	2	1.00	R	PU	✓	36
D2.12	Report on outreach activities	2	1.00	R	PU		48
D2.13	High field developments website	5	1.00	O	PU	✓	4
D2.14	High field publicity material	5	1.00	O	PU	✓	8
D2.15	Workshop on aspects of Functional Materials	5	2.00	R	PU	✓	18
D2.16	Workshop on aspects of Soft Matter	5	2.00	R	PU	✓	30

+ Neutronsources.org
+ Muonsources.org

The e-newsletter is sent out more frequently

N.B. Beneficiary is 3

WP4

NaMES

Neutron and Muon European Schools

- NaMES Brochure (2012)
- 15 supported schools
 - 2012: 11 schools (447 students)
 - 2013: 10 schools (372 students)
 - 2014: 10 schools
- Evaluation from Advisory Committee 2013: schools are broadly successful
- Schools directors meetings: GA 2013, GA 2014
- Synergies with e-learning WP3 and materials provided



HERCULES	February
HZB	February
Muon	March
CETS	May
ICMA	May
Bombannes	June
SISN	June/July
PSI	August
JDN	September
JCNS	September
Oxford	September
HZG	October
BSANS	October
Fullprof	November
Fan du LLB	December

nmi3.eu



Thank you!

Inês Crespo, Information Manager

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