UK Neutron & Muon Science and User Meeting 2022

Summary, and notes for future meetings

For ISIS User Committee, June 2022

The UK Neutron & Muon Science and User Meeting is held annually and is a chance for UK users of neutrons and muons to hear about latest science using these techniques, together with facility updates and other news of interest to the community. In April 2022 the meeting was held over three days at the Warwick conference centre. This was the first time that the meeting had been held physically since 2019 due to the Covid pandemic. The structure of the meeting was:

- Monday 25 April, pm : **Student day**. A chance for students who are using neutrons or muons in their projects to meet other students, learn more about neutron and muon techniques and present their work.
- Tuesday 26 April: **Science day**. Plenary talks together with parallel sessions based around five themes. A chance to hear latest results from members of the community.
- Wednesday 27 April, am: **User day**. Facility updates and other news of interest to ISIS and ILL users.

For the first time the science day was organised by the IoP/RSC Neutron Scattering Group on behalf of the user community. The programme for the meeting can be found at the end of this document.

There were 270 attendees overall, and 95 attendees for the student day.

Following the meeting, a questionnaire was sent to all attendees to get their views on the meeting; in particular, what they enjoyed and what didn't go so well about each of the three days, any comments on the venue, food, accommodation, etc., and any other comments. Respondents were also asked to give the meeting a score between 1 and 10, with 1 indicating they would advise colleagues not to attend, 10 being they would strongly urge colleagues to attend.

The questionnaire was returned by 88 people (33% of attendees). In terms of the score respondents were asked to give, the distribution is shown here:

Score	Number of occurrences
6	3
7	5
8	24
9	26
10	30
Average score	*8.85*

No-one scored below a 6; most gave 8, 9 or 10; and the average score was 8.85. This suggests that the meeting was very positively appreciated by almost all attendees. The general comments supported this, with a variety of expressions of enjoyment in the meeting, particularly the chance to meet together again physically, with the organisation and overall structure of the meeting being welcomed.

Regarding the student day, things most enjoyed included the talks by students, the chance to meet other students, the chance to mix with students and instrument scientists, the introductory technique talks and the overall ambience. Things to improve upon included better briefing for the students chairing the sessions, better use of microphones, more time for questions, a slightly less intense programme.

For the science day, things appreciated included the diversity of science presented, the chance to talk over coffee and interact with colleagues, the chance to meet in person, the mix of plenary and breakouts, the quality of the talks, the poster session, and the sense of the community. Things that could be improved upon included the space allocated to the poster session, more time to chat between sessions and a less intense programme with more breaks, publicising the list of speakers more in advance, moving between buildings too frequently, a longer discussion session with suggested questions available in advance, breakout session talks starting at the correct time to allow movement between sessions, 20 min rather than 30 min talks, more participation by ILL.

For the final morning, things appreciated included updates from facilities, the plenary talk, the opportunity for student talks. Things to be improved upon included the panel session, which was felt not to work well, not keeping to time, the length of the session, more focus on science updates from the facilities, lack of diversity amongst the facility speakers.

Regarding the venue, overall the food, accommodation and amenities were liked and the overall appeal of the venue was good. There were some specific comments regarding food, particularly the lack of choice or appropriate options for vegetarians, and that queues were too long to get food at times.

Response to comments

The organisers from ISIS and the IoP/RSC Neutron scattering Group met and reviewed the comments. Particular suggestions which will be taken forward into the organisation of the next meeting will include (in no particular order):

- making talk speakers and titles available earlier, pre the registration deadline
- more space for the poster session
- encouraging more ILL involvement
- modifying or removing the panel session on the final morning
- involving the chairs earlier in the planning of the breakout sessions
- ensuring earlier communication with speakers regarding their talks
- continuing with having half invited and half contributed talks
- possibly having longer for the discussion session and moving the discussion time so it isn't at the end of the breakout sessions. Publicising suggested questions in advance.
- Considering shorter talks in the science sessions
- Possibly starting the student day in the morning
- Better briefing for the student day chairs
- Involving the ISIS User Committee more in the final day, alongside the IoP/RSC Neutron Scattering Group
- Ask the Directors' talks to focus on science opportunities, and to consider how diversity in the Directors' talks can be improved
- Ask the venue to improve vegetarian options
- Publicity for the meeting through the IoP / RSC

	Monday 25 April - Student Day (for UK PhD students using neutrons or muons in their research)	**Neutron and Muon Science and User Meeting arrivals**
12:00	Lunch – Radcliffe Restaurant Registration - reception area at Radcliffe	
13:00	Welcome and overview – *Dr Philip King* Meeting Space 2 – Radcliffe	
13:10	Session 1: Group Talks *Chair: Mingrui Liao* Crystallography — *Silvia Capelli* Spectroscopy — *Svemir Rudic* Excitations and polarisation — *Aleksandra Krajewska* Muon Spectroscopy — *Adam Berlie*	
14:10	*Short Break*	
14:20	Session 2: Student Talks *Chair: Sarah Dugmore* High Ammonia Adsorption in MFM-300 Materials – *Wanpeng Lu, University of Manchester* Negative muon spin rotation analysis techniques – *George Gill, University of Oxford* Inelastic neutron scattering study of endofullerenes: CH4@C60 – *Mohamed Aouane, ILL* The Magnetic Structure of $V_{1/3}NbS_2$ – *Amelia Hall, University of Warwick*	
15:20	*Group photograph*	
15:30	*Coffee — Coffee Lounge*	
16:00	Session 3: Group Talks *Chair: Zac Amato* Small angle neutron scattering — *Olga Matsarskaia* Disordered materials — *Esther Girón Lange* ISIS support laboratories — *Daniel Nye* How to write a successful proposal – *Adrian Hillier*	
17:00	*Short Break*	
17:15	Session 4: Student Talks *Chair: Samuel Sneddon* Adsorption at the Calcite-Oil Interface as seen with Neutron Reflection – *Lana Farren, University of Cambridge* Mimetic bacterial membranes challenged by multivalent cations and quadruply charged peptides– *Xuying Guo, Bristol* e-learning at ISIS – *Rhina Houinato and Madeleine McRoberts, ISIS* Synthesis of deuterated materials for neutron studies – *Rebecca Asquith and Shaun Olok-Jacobs, ISIS*	
18:30	*Free time*	**18:00** Registration open – reception area at Scarman House
19:00 - 21:00	Student Dinner - Lakeview Restaurant section 1	**19:30 – 21:00** Buffet Dinner - Lakeview Restaurant section 2

Tuesday 26 April – Science Day

08:30	*Registration and coffee – The Slate*				
	Plenary session – Slate 1 Chair: Donna Arnold (Kent)				
09:00	**Welcome**				
09:05	**Plenary: Tom Lancaster (Durham)** "Using muons to explore low-dimensional and topological magnetism"				
09:35	**Plenary: Abbie McLaughlin (Aberdeen)** "Ionic Conduction in Hexagonal Perovskite Derivatives"				
10:05	**Plenary: Peter Moody (Leicester) "**Neutrons to find deuterons in enzyme crystals > Heme Peroxidase mechanisms"				
10:35	*Coffee – Slate 2*				
	Parallel Sessions (individual breakout rooms)				
11:00 – 13:00	**Energy & Functional Materials Scarman Space 41** Chair: Eddie Cussen, Emma McCabe 11.00 Jan-Willem Bos (Heriot-Watt) "In-situ neutron powder diffraction investigations of thermoelectric and electrode materials" 11.30 Stephen Skinner (Imperial) "Using in-situ neutron scattering to develop electrode materials for solid oxide cell applications" 12.00 Silvia Ramos Perez (Kent) "X-ray spectroscopy techniques in the development of new materials for energy applications" 12.30 Nicolás Flores-González (Glasgow) "Understanding the effect of lattice polarisability on the electrochemical properties of lithium haloaluminates, LiAlX4 (X = Cl, Br, I)"	**Magnetism & Superconductivity Scarman Space 42** Chair: Lucy Clark, Sean Giblin 11.00 Thomas Hicken (Royal Holloway) "Muons, solitons, and skyrmions: muSR studies of Cr1/3MS2 and GaV4S8" 11.30 Otto Mustonen (Brimingham) "Tuning magnetism in oxides using diamagnetic d10 and d0 cations" 12.00 Viviane Pecanha-Antonio (Oxford) "f-d electron hybridisation in iron garnets" 12.30 Geetha Balakrishnan (Warwick) "Investigations of skyrmion materials"	**Biosciences & Soft Matter Scarman Space 29** Chair: Jian Lu 11.00 Delaram Ahmadi (Manchester) "At last, some hard truths about soft stuff" 11.30 Tom Arnold (ESS) "LOKI & FREIA: The UK Instruments at ESS" 12.00 Zongyi Li (Manchester) "SANS study of Lipid Nanoparticles (LNPs) for Plasmid-DNA Delivery" 12.30 Olga Matsarskaia (ILL) "Towards a microscopic picture of coacervation in elastin-like peptides"	**Molecular Systems and Catalysis Scarman Space 24** Chair: Gosia Swadzba-Krasny 11.00 Alan Drew (Queen Mary) "Recent results on dynamics in small molecular semiconductors, probed by MuSR" 11.30 Camilla Di Mino (UCL) "Cooperative O-H···π and C-H···O Hydrogen Bonding in the Liquid State" 12.00 Zac Amato (Open University) "Exploiting Neutrons to Unveil Star-Formation: Exploring Dynamical Amorphous Ice Systems" 12.30 Terri-Louise Hughes (ISIS) "Combined Total Neutron Scattering and NMR Studies of Confined Hydrocarbons"	**Engineering Scarman Space 25** Chair: Richard Moat 11.00 Catrin Davies (Imperial) "Residual stresses in Laser powder bed fusion components" 11.30 Alexander Korsunsky (Oxford) "Diffraction studies of deformation and transformation in shape memory nitinol samples" 12.00 Dong Liu (Bristol) "In situ high-temperature neutron diffraction on unirradiated and irradiated nuclear graphite materials" 12.30 Matthew Roy (Manchester) **"**EASI-STRESS benchmarks: preliminary results from neutron diffraction measurements"

13:00	*Lunch – The Slate*				
14:15 – 15:45	Chair: Eddie Cussen, Emma McCabe 14.15 Rob House (Oxford) "Detection of trapped molecular O2 in a charged Li-rich cathode by Neutron PDF" 14.45 Shriparna Mukherjee (Reading) "Effect of Copper diffusion in low thermal conductivity of thermoelectric Tetrahedrites" 15.15 Andy Sode Anker (Copenhagen) "Using Generative Adversarial Networks to match experimental and simulated inelastic neutron scattering data"	Chair: Lucy Clark, Sean Giblin 14.15 Nicola Kelly (Cambridge) "Magnetism on the stretched diamond lattice in lanthanide orthotantalates" 14.45 Sudeep Kumar Ghosh (Kent) "Spin-triplet superconductivity in Weyl nodal-line semimetals" 15.15 David Jonas (Warwick) "A muon-spin relaxation study of type-I rhenium investigating time-reversal symmetry breaking in the superconducting state"	Chair: Wuge Briscoe 14.15 Kirill Nemkovskiy (ISIS) "Dynamics in liquids and soft matter studied by polarized QENS on the LET spectrometer" 14.45 Naomi Elstone (York) "Determination of bulk and interfacial properties and structure of IL mixtures" 15.15 Alexander Armstrong (ISIS) "Probing the Adsorption of the Organic Friction Modifier glycerol monooleate (GMO) at the iron oxide-dodecane Interface with Neutron Reflectometry"	Chair: Sanghamitra Mukhopadhyay 14.15 Mi Tian (Exeter) "Dynamics of H2 in different pore geometries via QENS" 14.45 Adam Jackson (ISIS) "Simulation of inelastic neutron scattering with AbINS" 15.15 George Bacanu (Southampton) "Inelastic neutron scattering of noble gas endofullerenes"	Chair: Hongbiao Dong 14.15 Christopher Lawson (ISIS) "Neutron Imaging of an Operational Dilution Refrigerator" 14:45 Alan Williams (Wallace Collection) "Shah Jahan and Mughal steel" 15.15 Adrian Hillier (ISIS) "Elemental analysis using muons"
15:45	*Coffee – served outside each breakout room*				
16:10 – 17:00	Chair: Eddie Cussen, Emma McCabe 16.10 Dave Growney (Lubrizol) "Neutralising Acid in Engine Oil – How Stopped-Flow Neutron Scattering Transformed our Perspective" 16.40 **Discussion**	Chair: Lucy Clark, Sean Giblin 16:10 Deniza Chekrygina (STFC) "Parameter estimation for Inelastic Neutron Scattering using Machine Learning." 16.40 **Discussion**	Chair: Jian Lu, Wuge Briscoe 16.10 Adam Squires (Bath) "From fibrils to membranes: new techniques to study self-organisation using deuterated biomolecules" 16.40 **Discussion**	Chair: Sanghamitra Mukhopadhyay, Gosia Swadzba-Krasny 16.10 Sihai Yang (Manchester) "Confined Catalysis of Small Molecules in Porous Materials" 16.40 **Discussion**	Chair: Richard Moat, Hongbiao Dong 16.10 None 16.40 **Discussion**
14.00 – 17.00 LENS Council Meeting: (for those who are members of the LENS Council) *Scarman Space 23* *Tea and Coffee will be available at 15:00*					
Plenary Session – The Slate					
17:15	**Willis Prize for neutron scattering: award and talk**				
18:00 - 19:20	*Poster session with drinks - Lakeview Restaurant – Scarman House*				
19:30	*Conference dinner – The Slate*				

Wednesday 27th April – User Meeting

Chair: Donna Arnold (Kent)

The Slate

09:00	**Welcome: Donna Arnold**
09.10	**Plenary: David Lennon (Glasgow)** "Neutron scattering techniques for the understanding of heterogeneously catalysed processes"
09.40	**Student talk:**
09.55	**Student talk:**
10:10	**Update from STFC and UKRI – Alan Partridge (STFC Executive Director for Large Scale Facilities)**
10:30	**STFC Panels: Kathi Edkins (Manchester, member of STFC's Life Sciences and Soft Matter Advisory Panel)**
10:35	**Update from facilities – ESS – Helmut Schober (ESS Director General)**
10:55	*Coffee - Slate 2*
11:15	**Update from facilities – ILL – Paul Langan (ILL Director)**
11:35	**Update from facilities – ISIS – Roger Eccleston (ISIS Director)**
11:55	**Update from facilities – Diamond – Andrew Harrison (Diamond Chief Executive)**
12:15	**Table discussions**
12:20	**Panel Q&A**
12:40	**Poster Prize award and talks**
13:00	**Closing remarks**
13:15	*Lunch – The Slate*