

Summary of contribution to the ICANS-X panel discussion

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Users are a nuisance, but they are essential to ensure the long-term funding and optimum utilisation of research facilities as expensive as advanced neutron sources. Users are also naive, and so we should follow the tradition set by Lord Reith, the founder of the BBC, and give them what is good for them rather than what they want! The typical user wants ten times more flux, ten times better resolution and ten times more beam time! But the history of neutron scattering shows that advances are instrument-led rather than science-led. This is perhaps inevitable in a field such as condensed matter studies where neutron scattering is but one (albeit a very important one) of the techniques available.

The current generation of accelerator-based pulsed neutron sources represent one such major advance giving, as we have seen at this conference, significant improvements in resolution (from the sharpness of the pulses) and signal-to-noise (from the time discrimination of fast and thermal neutron). Source reliability at greater than the 80% level is essential for efficient scheduling of a user programme, and that has now been shown to be achievable. Powerful computing tools are also essential to allow the user to extract the meaningful information from the deluge of data, and these will continue to be developed in a user friendly way. One promise held out by pulsed sources is the exploitation of the fixed-scattering geometry to allow the use of exotic sample environment. Development funds spent in this area will be well rewarded.

For the next generation neutron source we should try to combine the newly discovered advantages of the high resolution, sharp pulse spallation sources with the experience built up over the years on steady state sources. The SDI programme has shown that the current generation of accelerators are nowhere near their technological limit. A relatively modest increase in proton current, to say 1-2 mA, would not only boost the performance of traditional time-of-flight instruments but also give sufficient flux from an unpoisoned moderator to compete effectively as a steady state source whilst retaining all the advantages of a pulsed source. Incorporation of time discrimination for order and background suppression on a triple-axis crystal spectrometer is a truly exciting prospect.
