



SVENSKA KEMISAMFUNDET

Sektionen för ytkemi och materialkemi

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The recent and comprehensive suggestion by VR for the strategy for Swedish participation and hosting of ESS includes a range of concrete and sensible suggestions for a long term benefit to Sweden in the use of neutrons, and the coordination with the colocalised MAX-IV.

Amongst these suggestions are:

- i) that strong research areas with the potential to utilise neutron scattering should be identified and
- ii) that efforts should be made to ensure that at least one of the instruments 17-22 should be driven from Sweden.

Surface Science and Materials Science is an area in which Sweden is world-leading, and on a per capita basis must be amongst the strongest countries in the world. These disciplines underpin many of the important research challenges currently addressed in Sweden. They encompass colloid science, soft matter, biological materials, functional coatings and thin film magnetism. The last decennia have seen a revolution in terms of recognising the importance of nanostructures and integrating them into research across the disciplines. Taking advantage of the nanostructure of cellulose to produce new sustainable composites and materials is for example the focus of current National Research Initiatives from the Forest Products Industry. Energy harvesting devices such as solar cells, and novel fuel cells and batteries depend heavily on functional films in this size range and interfacial phenomena are currently major obstacles limiting their reliability, function and implementation. Finally, biomedical materials, cell signalling phenomena and the development of a new generation of drugs to replace antibiotics and thus combat the threat of multiresistant bacteria all rely intensively on the understanding, application and generation of nanoscale features at both interfaces and in materials.

As a section of the Swedish Chemical society, we represent at a national level the interests of our disciplines and our members in both academia and industry, independently of research politics and university association. We would state emphatically that our community is strong and vibrant and is an obvious potential user group of a suitable neutron scattering technique.

Such a technique is GISANS – Grazing Incidence Small Angle Neutron Scattering. It has unique possibilities in terms of studying the distribution of distances, particles and length scales in complex hierarchical materials on the nanometre to micrometre size range and probing buried interfaces that are not accessible by any other technique. Furthermore it offers the possibility of probing magnetic materials using polarised neutrons that is a unique aspect of the approach. The technique exists today but is of limited application and use due to the relatively low intensity of neutrons in contemporary facilities. It offers complementary information to the X-ray scattering equivalent GISAXS, with which it shares many technical and analytical similarities. There would thus be a synergy to be achieved from a cross fertilisation with GISAXS instrumentation at MAX-IV.

There is no nation more suitable than Sweden to lead the development of a GISANS instrument, and to reap the benefits of its development and implementation. It would allow Sweden to maintain and advance its leading position in surface and materials science. Our section looks forward to working together with the relevant actors in Sweden and abroad to build support and contribute to the science case for GISANS.

We would like to suggest that there is a clear and present opportunity to design and develop a GISANS instrument capable of meeting the demands of Swedish academia and industry, and a community ready to embrace, maintain and exploit it.

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