UppCANs: Bringing neutrons to the users

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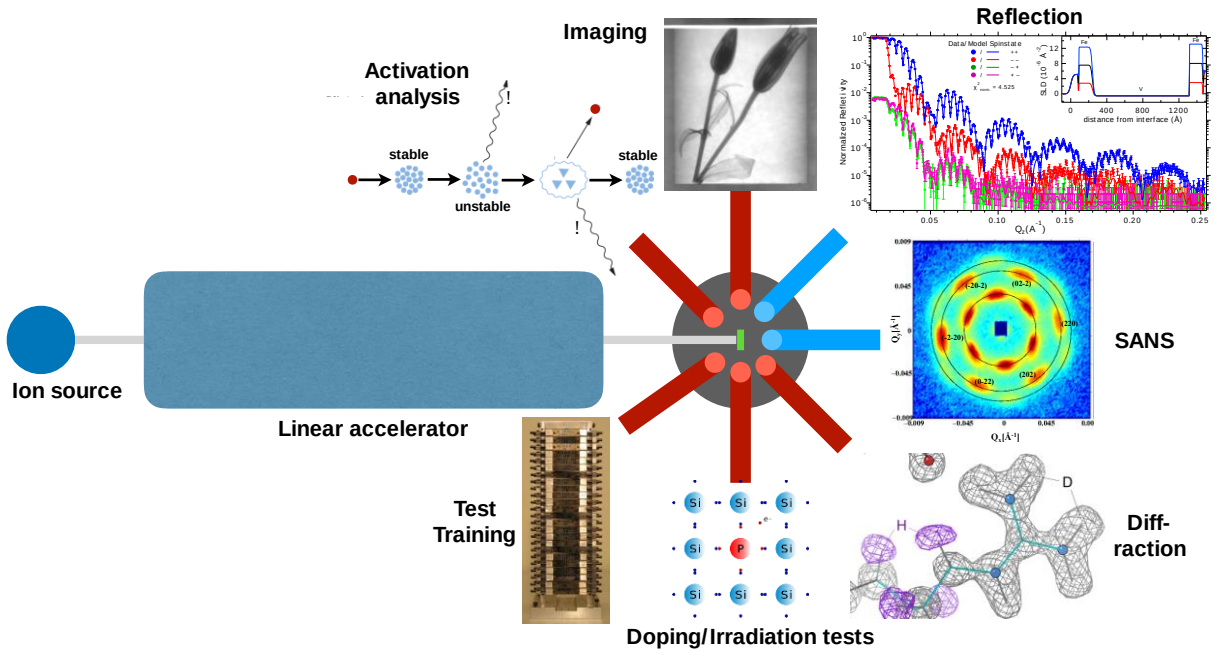
Neutrons provide unique and essential tools for research across many disciplines ranging from basic sciences of materials, biology and chemistry to engineering and studies of heritage artefacts. The present neutron facilities are currently decreasing in number. This overall shortage will not be compensated by ESS offering the best available brilliance but a limited total number of beam days.

Ultra-compact accelerator driven neutron sources (UCANS) can provide small facilities and enable easy accessibility by bringing neutron instruments close to the users. These use modest energy protons (~18 MeV) that impact on a light target. This allows an extremely compact design of the moderators. The small size and optimised source design provide good brilliance at reasonable cost. Dedicated instrumentation can compete in performance with current small to medium size facilities and complement high brilliance sources in an ideal way.

I will present a project for UppCANs in Uppsala. When built, this would provide neutrons for 5 to 7 beam ports and offer a broad range of modern capabilities allowing the existing community to both complete straightforward measurements and prepare to exploit world leading instruments elsewhere. In addition UppCANs will provide neutrons at a lower cost for experimental methods that are very relevant for industry, in particular, imaging, doping and activation analysis and the ready accessibility will encourage use in newer domains such as medical and environmental sciences and heritage studies.



Schematic diagram of an ultra-compact neutron source: Protons are accelerated in a linear accelerator and send onto a light target. The resulting neutrons can be moderate and used for experiments