**Poster**

# SINCRYS – single-crystal materials science beamline at MAX IV

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Throughout history our use and understanding of materials evolved and allowed us to develop technologies that have transformed all aspects of our lives. Today this field of science is known as materials science in which researchers study how the structure of a material gives rise to its properties. In other words, a thorough understanding of the atomic structure of a material is fundamental to the understanding of its performance. Single crystal X-ray diffraction is the preferred technique to solve the atomic structure of a crystalline material. It is now a routine technique in many research laboratories, however, the limited flux, spectral purity and focusing ability of a lab-source severely limits the size and quality of the crystals that can be studied.

The SINCRYS [1] project aims to establish a state-of-the-art small-molecule single-crystal instrument as a side branch to the DanMAX beamline [2] at MAX IV [3] (see **Figure 1**). The goal of this beamline project is to establish an instrument mimicking the macromolecular crystallography approach in terms of accessibility and state-of-the-art equipment, however, tailored for small unit-cells and materials science. The instrument will feature a very high flux for general single-crystal sciences with a focal beam size of 8 x 5 µm (up to 100 x 100 µm, FWHM) and will allow the study of micro crystals with sizes down to ~5 µm and energies in the range of 20 – 23 keV. The end station will feature a very precise mini-kappa micro-diffractometer, a sample changer robot and an EIGER2 X CdTe 4M detector mounted on a robotic arm to allow exceptional flexibility in detector placement. This will facilitate experiments ranging from highly automatised routine structure determinations, high-resolution charge-density investigations to diffuse scattering data collections. The degree of automation ensures optimal conditions to setup a *Scandinavian Crystallography Service* (SCS), a portal for service crystallography inspired by the successful UK *National Crystallography Service* [4]. First light is anticipated for the beginning of 2026.

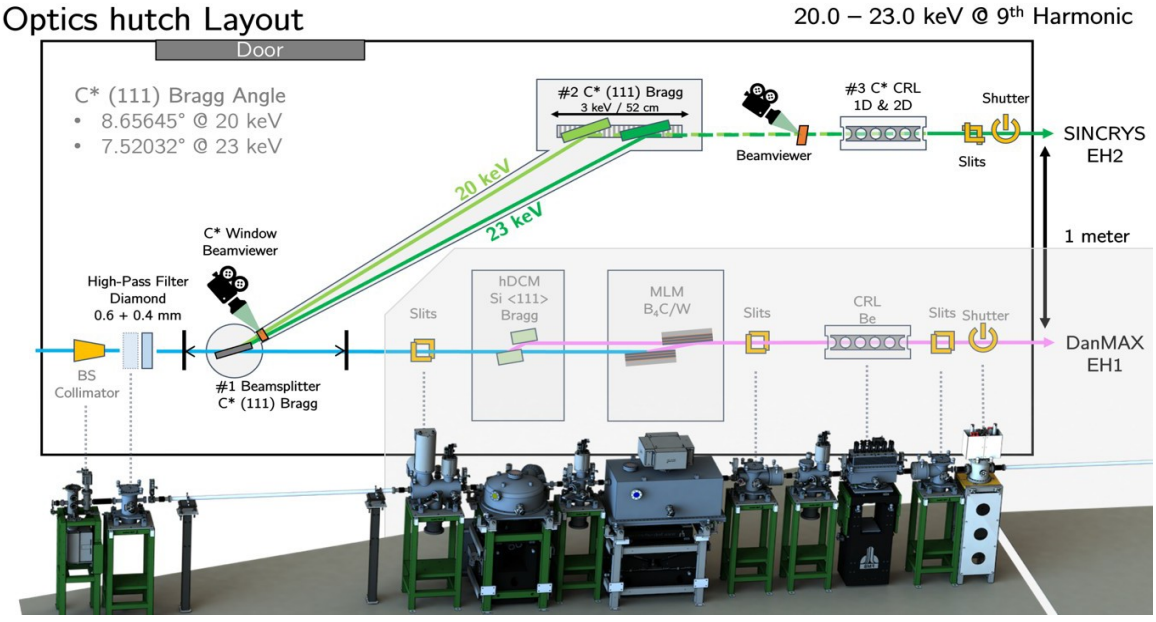


**Figure 1**. Illustration of optical components showing the DanMAX beam and the SINCRYS branch.

[1] www.maxiv.lu.se/beamlines-accelerators/beamlines/danmax/experimental-station/sincrys/

[2] www.maxiv.lu.se/danmax

[3] P. F. Tavares *et al.* (2014). *J. Synchrotron Rad.*, **21**, 862-877.

[4] www.ncs.ac.uk

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