

## The 'Why' and 'How' of a Dedicated Electron Diffractometer

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Electron Diffraction (ED) as such has been around since the early days of Electron Microscopy. However, only since Transmission Electron Microscopes (TEMs) are available with accelerating powers of 200 to 300 kV and 2D detectors have become fast enough, **Electron Crystallography really took off.**

So far, ED could only be done in modified TEMs, resulting in **challenging experiments and limited datasets**, yet, structures could be obtained from samples in the range of merely tens of nanometers, that were unsolvable with either conventional or even synchrotron X-ray radiation.

For some reason, no dedicated Electron Diffractometer has been available commercially so far. **Data quality would greatly benefit** from a setup that focuses on the diffraction capability over imaging and allowing for faster and more complete datasets through proper 3D electron diffraction (3D-ED).

We will present a possible **Electron Diffractometer** design for Electron Crystallography from the point-of-view of X-ray Crystallography and indicate improvements over present TEM-based as well as X-ray instruments.



**Figure 1.** The Electron Diffractometer

[1] J. Heidler et al., (2019) *Acta Cryst.*, **D75**, 458-466.

[2] T. Grüne et al., (2018) *Angew. Chem. Int. Ed.*, **57**, 16313-16317.

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