

# Applications of Soft X-ray Detectors in Coherent Diffractive Imaging

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The ability to computationally transform coherent diffraction patterns into high spatial resolution images in coherent diffractive imaging (CDI) experiments at synchrotrons relies on the detection of weak signals of scattered photons. CDI techniques, such as X-ray ptychography, in the soft X-ray regime have been hampered by the challenging photon detection in this energy range. Nonetheless, microspectroscopy with soft X-rays is invaluable for the characterisation of chemical and ferroic properties of materials. The recent development of the iLGAD EIGER 1, which is the first single-photon counting detector in the soft X-ray energy range has improved ptychographic imaging. An overview of recent imaging experiments in condensed matter physics 2 3 4 and other scientific areas that stand to benefit from CDI in the soft X-ray energy range will be provided.

- 1 F. Baruffaldi *et al.*, *Commun. Phys.* **8**, 321 (2025).
- 2 T. A. Butcher *et al.*, *Adv. Mater.* **36**, 2311157 (2024).
- 3 T. A. Butcher *et al.*, *Phys. Rev. Appl.* **23**, L011002 (2025).
- 4 T. A. Butcher *et al.*, *Phys. Rev. B* **111**, L220409 (2025).

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