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MS37-04 **'Digital' Electron Diffraction.** David I. Woodward,[a] Paul J. Thomas,[b] Pam A. Thomas,[a] Rudolf A. Römer,[a] Richard Beanland.[a] [a]*Department of Physics, University of Warwick, UK,* [b]*Gatan UK Ltd, Abingdon, UK.*
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Electron diffraction exhibits very small scattering angles which in convergent-beam techniques leads to overlapping data from different diffracted beams unless the angular range of the incident beam is restricted by an aperature. This fundamental problem has restricted the application of many electron diffraction techniques to materials with small lattice parameters, which give relatively widely-spaced diffracted beams. Digital image capture, in conjunction with computer control of electron microscopes, opens up possibilities for data collection and manipulation that are impossible using manual control or film-based imaging. Here, we show that it is now straightforward to combine a thousand individual diffraction patterns or more into a single dataset. Acquisition rates are sufficiently rapid for a dataset to be obtained without being limited by drift or contamination. The results show an astonishing level of detail, including the clear depiction of the presence of a centre of symmetry and the presence of Gjřnnes-Moodie crosses associated with kinematically-forbidden reflections [1]. They give a new way to apply the techniques of symmetry determination developed for convergent-beam patterns, both simplifying it experimentally and widening the range of structural systems which can be tackled. The technique can be used on any microscope with computer control and a digital camera. The technique is a promising route to the unambigious determination of local symmetry at a nanometre scale.

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