

Abstract Submitted
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**Holographic reconstruction from electron diffraction patterns:
true atom images of thousands of atoms** CARSTEN WESTPHAL, TOBIAS
LUEHR, Fakultät Physik, Otto-Hahn-Str. 4, 44221 Dortmund, Germany — Af-
ter its discovery in the early 70ies of the last century x-ray photo-electron diffrac-
tion (XPD) has been very successfully applied for the characterization of crystalline
systems and adsorbate structures later. The emitted electron wave contains the
full spatial information of the atoms' arrangement around the emitter atom. How-
ever, a holographic reconstruction yielding a 3-dimensional image of the investigated
structure was with the exception of a very few special cases rarely successful. In
most cases, the reconstruction contained strong image distortions due to the strong
anisotropic scattering characteristics in the electron-atom interaction. Here, we
present a new approach from angle-resolved diffraction patterns recorded at electron
kinetic energies above 10 keV for the first time. The new reconstruction scheme is
a direct method for revealing the crystal structure without any further information.
We present spatial images of different crystal systems showing thousands of atoms
at their correct location.

Carsten Westphal
Fakultät Physik, Otto-Hahn-Str. 4, 44221 Dortmund, Germany

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