Compressed sensing applied to HAADF STEM

In compressed sensing (CS), a signal is recorded in a "scrambled" way. The advantage is that when the scrambling is done right, the original signal can be retrieved from far fewer measurements than prescribed by the Nyquist theorem. The requirement being that the signal is sparse, i.e. is represented by many zeros in a certain basis set.

In this project we apply CS to high angle annular dark field scanning transmission electron microscopy (HAADF STEM), an imaging mode in electron microscopy that is excellently suited for atomic resolution imaging.

Email: vandenbroek@physik.hu-berlin.de | **url:** https://www.physik.hu-berlin.de/en/sem
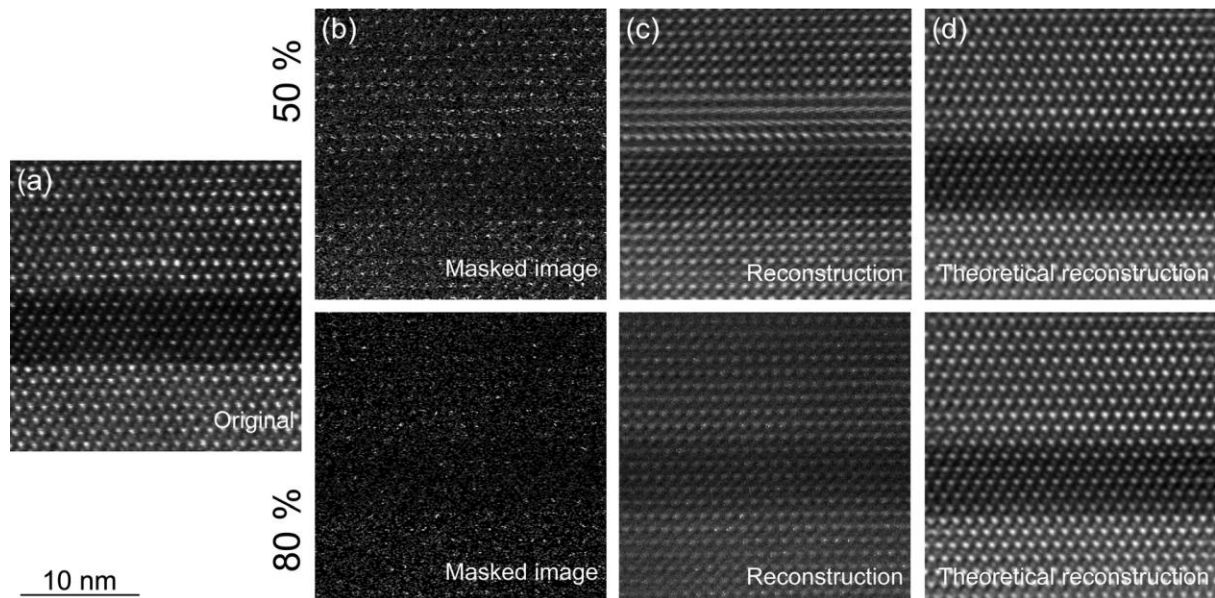

Fig. 1. Experimental acquisition of STEM images at atomic scale: (a) original unblanked, (b) images with either 50% or 80% of pixels blanked, (c) reconstructed images, and (d) reconstructed images from a masked original image. Source: Béché et al. Appl. Phys. Lett. **108**, 093103 (2016)