Accepted Manuscript

Direct imaging detectors for electron microscopy

A.R. Faruqi, G. McMullan



 PII:
 S0168-9002(17)30778-7

 DOI:
 http://dx.doi.org/10.1016/j.nima.2017.07.037

 Reference:
 NIMA 59986

To appear in: Nuclear Inst. and Methods in Physics Research, A

Received date :10 May 2017Revised date :29 June 2017Accepted date :19 July 2017

Please cite this article as: A.R. Faruqi, G. McMullan, Direct imaging detectors for electron microscopy, *Nuclear Inst. and Methods in Physics Research*, A (2017), http://dx.doi.org/10.1016/j.nima.2017.07.037

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

1	Direct Imaging Detectors for Electron Microscopy.
2	A.R.Faruqi [*] , G.McMullan
3	MRC Laboratory of Molecular Biology, Cambridge CB2 0QH, U.K.
4	

5 Abstract

6 Electronic detectors used for imaging in electron microscopy are reviewed in this paper. Much of the detector 7 technology is based on the developments in microelectronics, which have allowed the design of direct detectors 8 with fine pixels, fast readout and which are sufficiently radiation hard for practical use. Detectors included in this 9 review are hybrid pixel detectors, monolithic active pixel sensors based on CMOS technology and pnCCDs, which share one important feature: they are all direct imaging detectors, relying on directly converting energy in a 10 semiconductor. Traditional methods of recording images in the electron microscope such as film and CCDs, are 11 12 mentioned briefly along with a more detailed description of direct electronic detectors. Many applications benefit 13 from the use of direct electron detectors and a few examples are mentioned in the text. In recent years one of the 14 most dramatic advances in structural biology has been in the deployment of the new backthinned CMOS direct 15 detectors to attain near-atomic resolution molecular structures with electron cryo-microscopy (cryo-EM). The 16 development of direct detectors, along with a number of other parallel advances, has seen a very significant amount of new information being recorded in the images, which was not previously possible - and this forms the main 17 18 emphasis of the review.

19 *Keywords*: Direct detectors; Electron Microscopy; Imaging detectors; Electron cryo-microscopy; CMOS detectors

*Corresponding author. Tel.:0044-1223-207816; e-mail: arf@mrc-lmb.cam.ac.uk

Download English Version:

https://daneshyari.com/en/article/8167422

Download Persian Version:

https://daneshyari.com/article/8167422

Daneshyari.com