Contribution ID: **218** Type: **talk**

Review of single photon imaging techniques with fast timing for applications in space and particle physics, and the life sciences (in-person)

Tuesday 14 September 2021 10:30 (15 minutes)

There is an increasing demand for photon counting detectors capable of time-resolved imaging in many fields. In this paper we review the available detector and electronic technologies available and under development for applications such as Cherenkov imaging in particle physics and gamma-ray astronomy, and for wide-field fluorescence lifetime imaging in the life science field. While traditional vacuum tube devices such as the microchannel plate image intensifier still offer state of the art timing performance, the recent and rapid development of silicon photomultipliers, single photon avalanche detector arrays, and other hybrid devices are providing ever stronger competition. Advances in multichannel ASIC electronics for high throughput multichannel waveform capture and time to digital conversion have kept up with detector development and systems with 100 Mcount/s throughput at sub-100 ps single photon timing are becoming realistic. We discuss the requirements of various applications in terms of imaging, time resolution and throughput and compare the advantages and disadvantages of the competing technologies.

Your name

Jon Lapington

email

jsl12@le.ac.uk

Title

Nationality

Institute

University of Leicester

Authors: Prof. LAPINGTON, Jon (University of Leicester); Prof. KATARIA, Dhiren (Mullard Space Science Laboratory, University College London)

Presenter: Prof. LAPINGTON, Jon (University of Leicester)

Session Classification: Applications in Astronomy, Planetary and Space Science 1

Track Classification: Applications in Astronomy, Planetary and Space Science