

## **Poisson distribution**

A stochastic experiment is repeated many times. Let the expected number of successes be  ${\lambda}^{2}.$ Then the probability of observing n successes would be

 $P_{nu}(n) = { (nu^n e^{-nu})$  $ver{n!} }$ 

The Poisson distribution is of interest especially for TCSPC: The expected number of photons in any TCSPC channel is given by the 'real' decay (including convolution with the IRF etc.), while the stochastic nature of the measurement process (either a photon is detected or it is not) introduces noise, which follows a Poisson distribution. In the limit of large  ${ \sum {\frac{1}{2}} the Poisson distribution approaches a WGaussian distribution with a width of $\sqrt{\nu}$ centred around ${\nu}^{{}}.$ 

In the Gaussian limit least squares wfitting may be applied, otherwise MLE wfitting is preferable.

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