

# Photometry

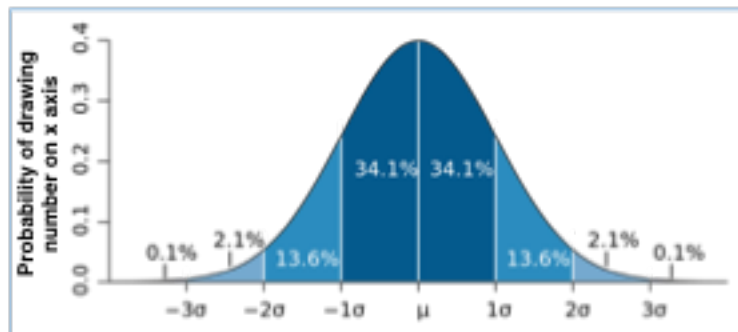
- Statistics!
  - Gaussian
  - Poissonian/"shot noise"
- Signal and Noise in Astronomy
- CCD Detectors

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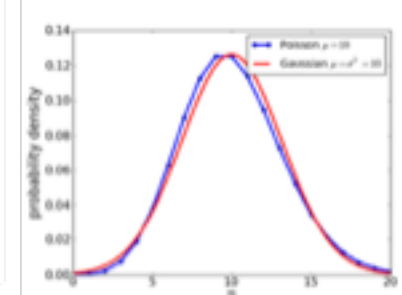
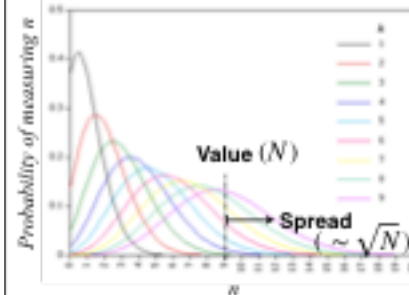
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# Gaussian Statistics



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# Poisson Statistics



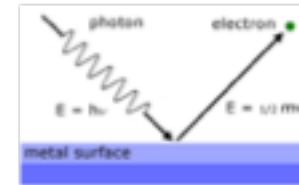
- Rule of thumb:  
Poisson  $\sim$  Gaussian when you are counting  $\gg 20$  of something
- That is,  $\sigma \approx \sqrt{N}$

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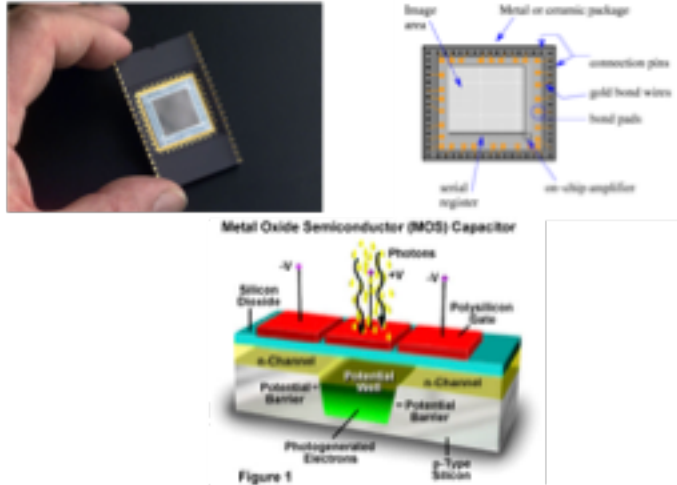
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## Photoelectric Effect



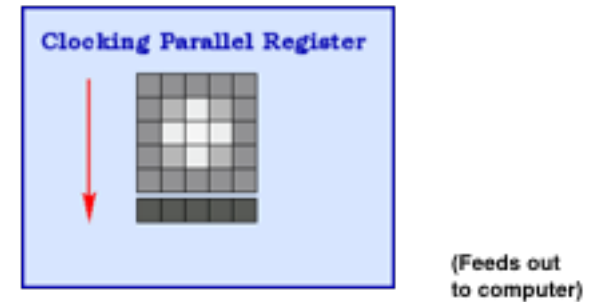
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## Charge-Coupled Devices (CCDs)



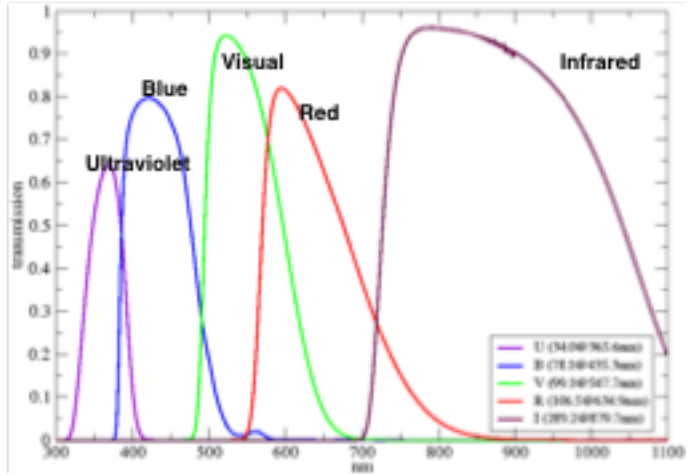
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## CCDs



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## Johnson Filters



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## Noise sources in CCD astronomy...

- Source self-noise (generic)
- Sky noise (generic)
- "Read noise" (CCDs only)
- "Dark current" (CCDs only)

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