

Top 10

Most important things in applied statistics

1. Errors decrease with the **square root of N**
2. **ChiSquare** is simple, powerful, robust and provides a **fit quality** measure
3. **Binomial** distribution → **Poisson** distribution → **Gaussian** distribution
4. **Error propagation** is **craftsmanship** - **fitting** is an **art**
5. Error on a (Poisson) number, N : \sqrt{N} on a fraction, $f=n/N$: $\sqrt{f(1-f)/N}$.
6. **Correlations** are important and needs consideration
7. Hypothesis testing of H_0 (null) and H_1 (alt.) is done with a test statistic t
8. The **likelihood** (ratio) is generally the optimal estimator (test)
9. Low counting statistics is terrible – needs special attention
10. Prior probabilities needs attention, i.e. Bayes' Theorem