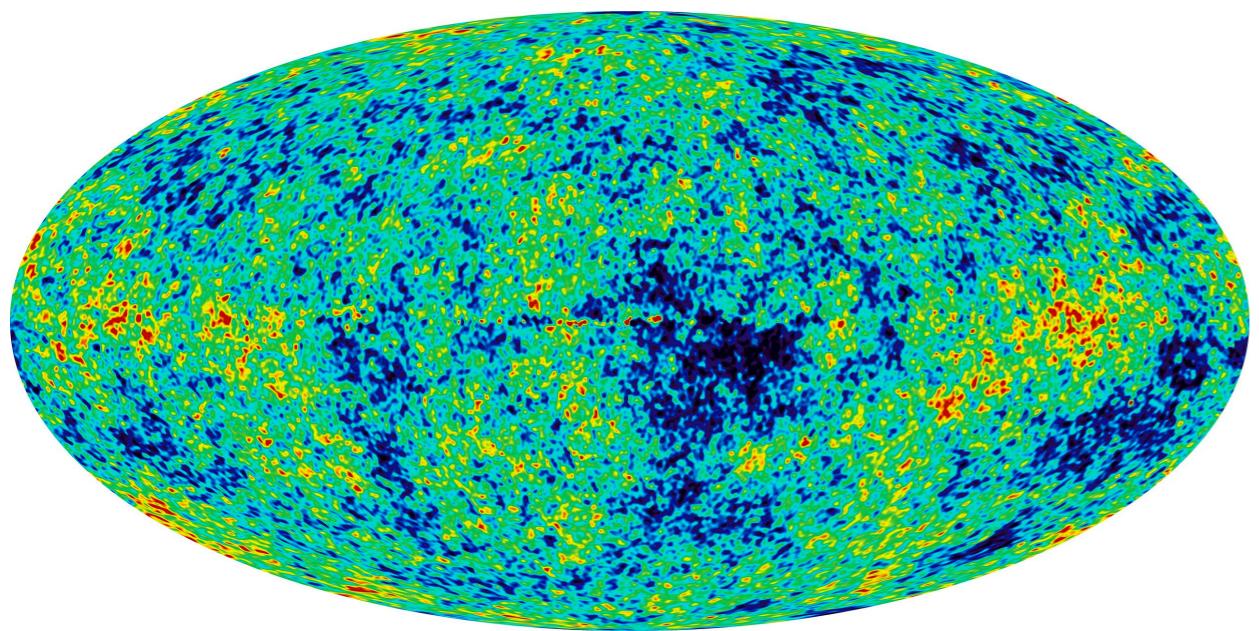


Astrostatistics

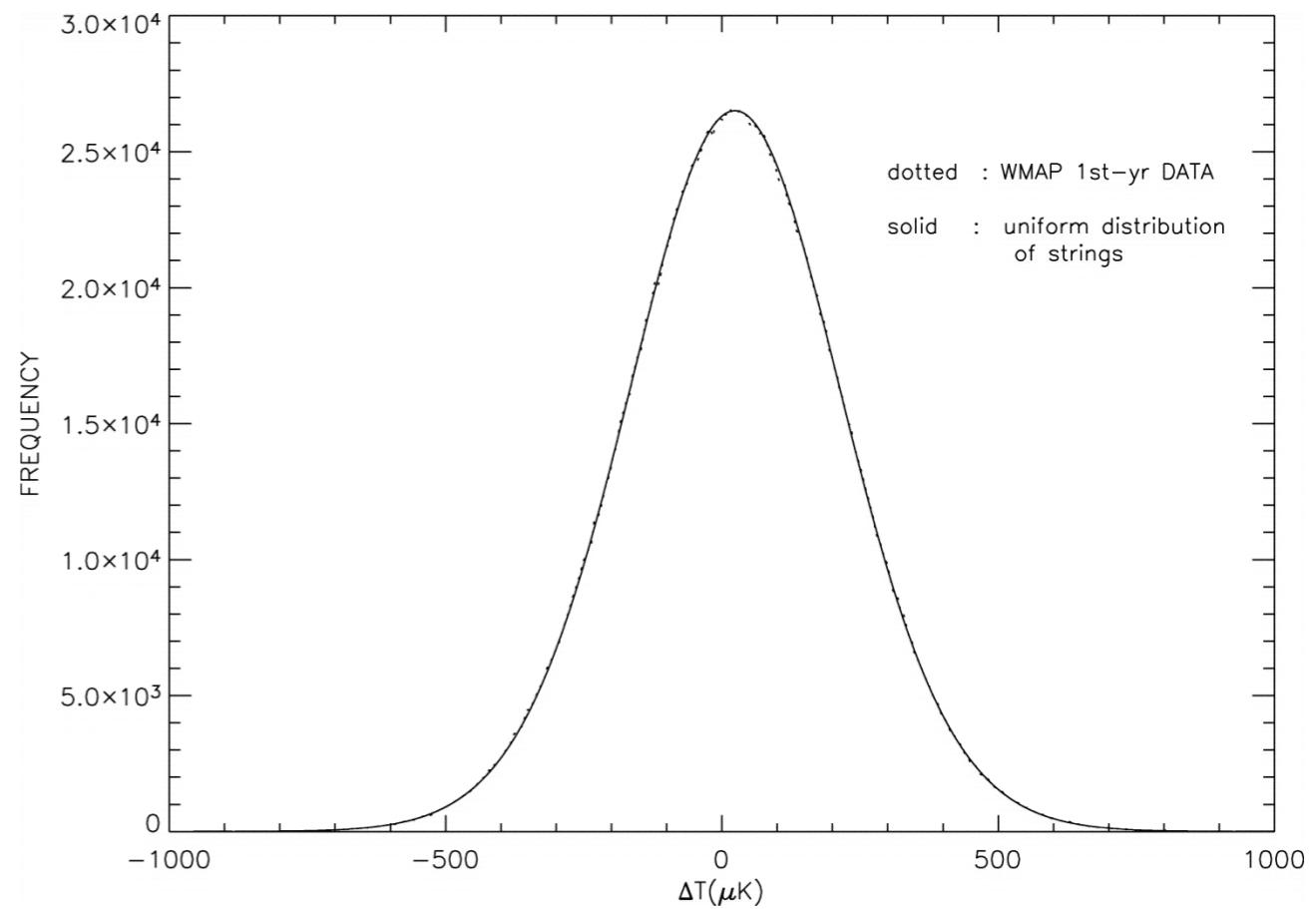
Fri, 24 January 2020

- Probability & Statistics Foundations:
 - Probability: F&B Ch 2, Ivezic Ch 3
 - Ivezic Ch 4 “Classical Statistical Inference” & Ch 5 “Bayesian Statistical Inference”
 - F&B Ch 3 “Statistical Inference”
- Frequency Properties of Statistical Estimators

Cosmic Microwave Background



WMAP of the sky



Gaussian distribution of temperatures at each pixel

Mean vs Midrange for Uniform Sample

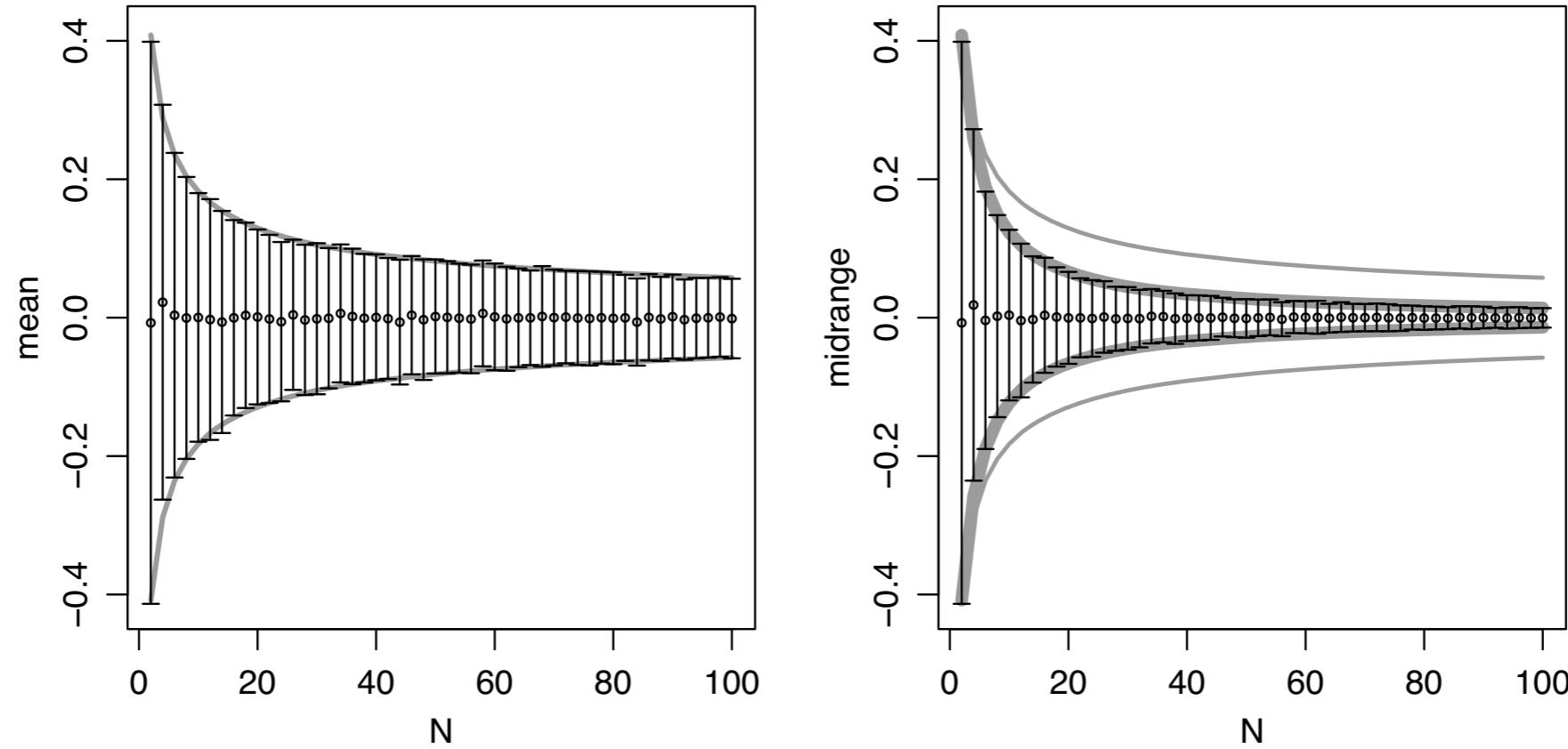


Fig. 2.3 The left panel shows the mean (circles) and standard deviation of the mean (error bars) for the mean estimator, $(1/N) \sum x_i$, of a sample of size N drawn from the uniform distribution $\mathcal{U}(-1, +1)$. The right panel shows the same but for the midrange estimator, $(x_{\max} + x_{\min})/2$. The thin grey lines (identical in both panels) show the expected standard deviation of the mean estimator, σ/\sqrt{N} (where $\sigma = 1/\sqrt{3}$ is the standard deviation of the uniform distribution). The thick grey lines in the right panel – which more or less overlap the ends of the error bars – show the expected standard deviation of the midrange estimator, $\sigma\sqrt{6}/(N+2)(N+1)$.