3D ellipsoid shape parameters

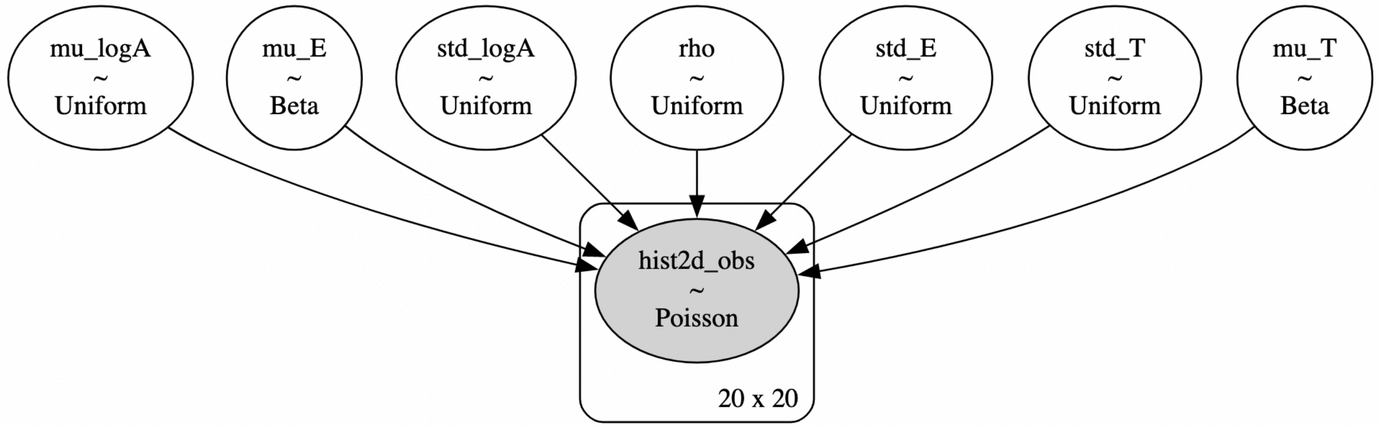
ellipticity triaxiality size

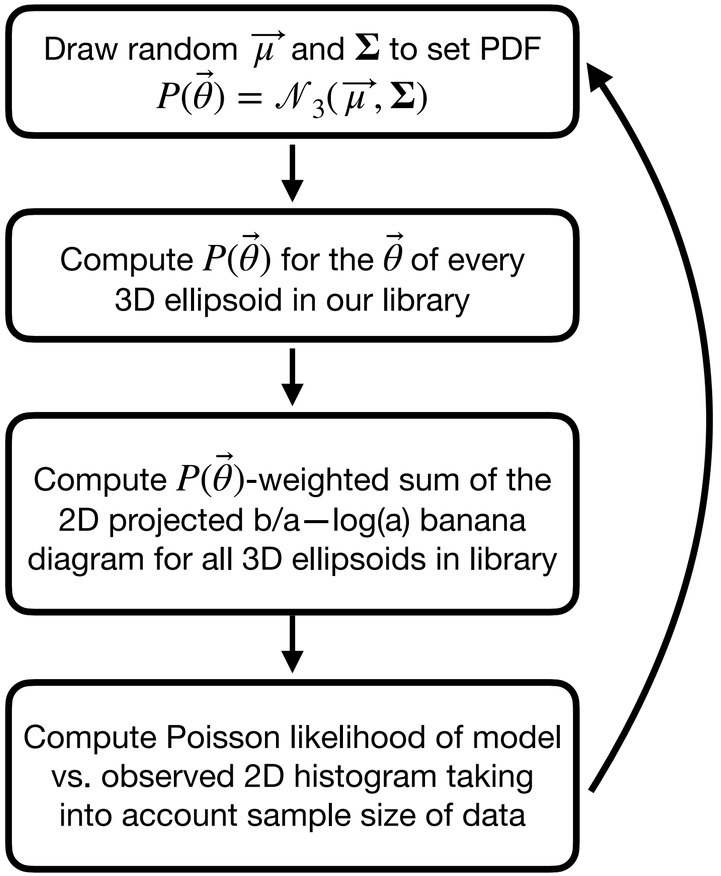
$\vec{\theta}$ assumed to be distributed as 3D Gaussian with unknown mean $\vec{\mu}$ and covariance matrix $\mathbf{\Sigma}$

$$\vec{\theta} \equiv (E, T, \log A) \sim \mathcal{N}_3(\vec{\mu}, \mathbf{\Sigma})$$

where

$$\vec{\mu} = (\mu_{\mathrm{E}}, \mu_{\mathrm{T}}, \mu_{\log \mathrm{A}}) \qquad \mathbf{\Sigma} = \begin{bmatrix} \sigma_{\mathrm{E}}^2 & 0 & \rho\sigma_{\mathrm{E}}\sigma_{\log \mathrm{A}} \\ 0 & \sigma_{\mathrm{T}}^2 & 0 \\ \rho\sigma_{\mathrm{E}}\sigma_{\log \mathrm{A}} & 0 & \sigma_{\log \mathrm{A}}^2 \end{bmatrix}$$





Observed uncertainties in b/a and log(a) are taken into account when creating the library of banana diagrams

Poisson likelihood of each bin of the 2D histogram is assumed to be independent for simplicity