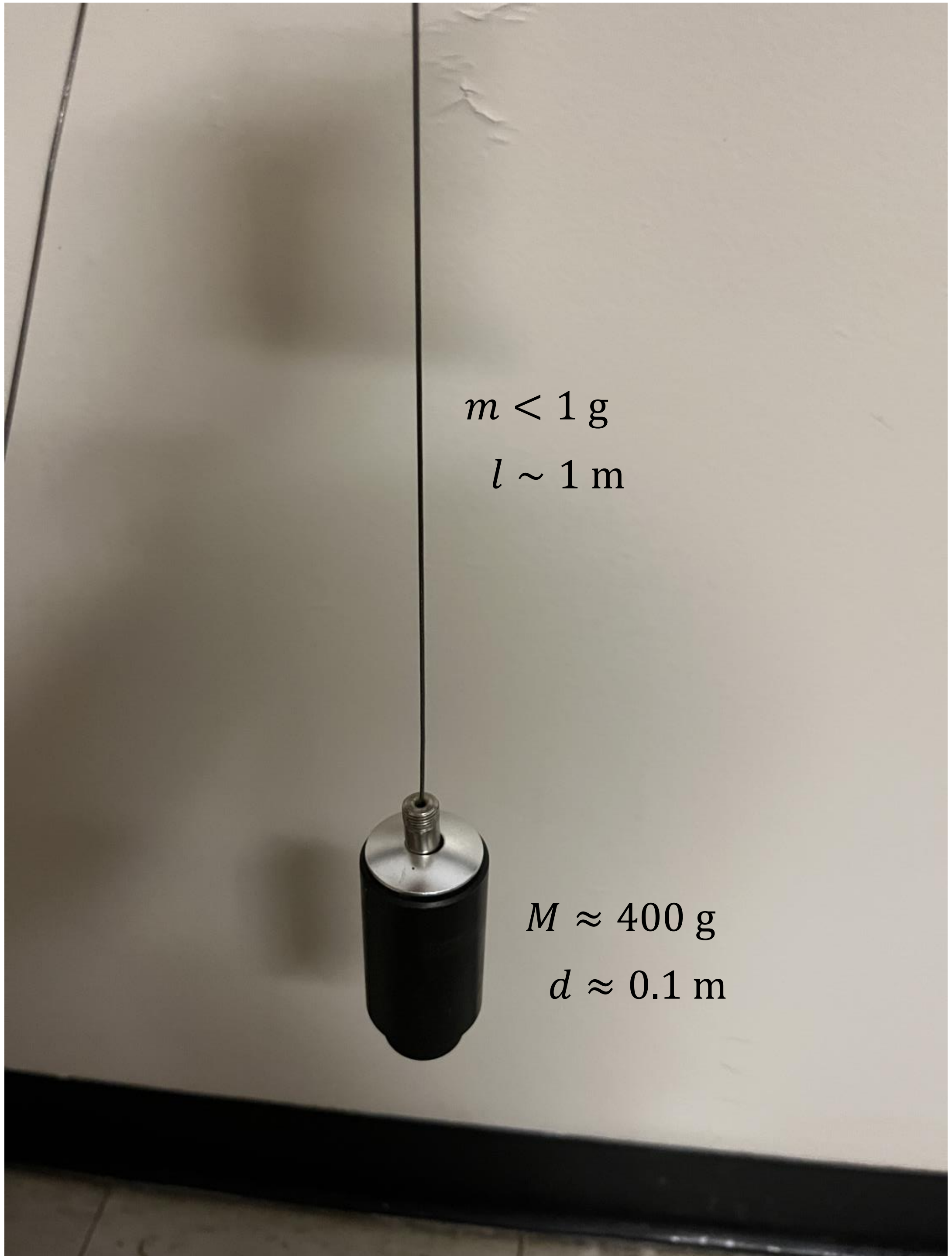
$m < 1$ g
$l \sim 1$ m
$M \approx 400$ g
$d \approx 0.1$ m

- 12 lengths (l), at each measure 16 10-periods. The actual periods and uncertainties (μ_T, σ_T) are reduced using Bayesian statistics with equal-probabilistic priors

$$-2\log(\mathcal{L}) = N.\log(2\pi\sigma_T^2) + \sum\left(\frac{T-\mu_T}{\sigma_T}\right)^2$$

$$\mu_T, \sigma_T = \underset{\mu_T,\sigma_T}{\arg\min} -2\log(\mathcal{L})$$

- The gravitational field strength (and the COM offset) is then obtained via the chi-square maximum likelihood fitting $\chi^2 = \sum\left(\frac{(y-\hat{y}(x))}{\sigma_y}\right)^2$, with $y = \left(\frac{T}{2\pi}\right)^2$, $x = l$, and $\hat{y}(x) = \frac{x+l_0}{g}$ (using the $I_M \sim Md^2 \ll Ml^2$ approximation).

- However, measurements of l is typically off by 2mm, which we model as uniform distribution centering at l with widths of 4mm. Sampling values of l and repeating the chi-square optimization, we obtain the following distribution of fitted parameters.

- Main source of systematic errors: the I_M approximation ($\sim 1\%$), (exhausted) human reaction speed ($\sim 2 \times \frac{0.2s}{20s} \sim 2\%$). We note that by taking many measurements at the same length and performing a Bayesian fitting, the latter is greatly reduced. An additional source of error is the pivot of the pendulum being bended due to the wire stiffness. In total, $\sigma_g^{sys} \simeq 0.09$ m s^{-2}.