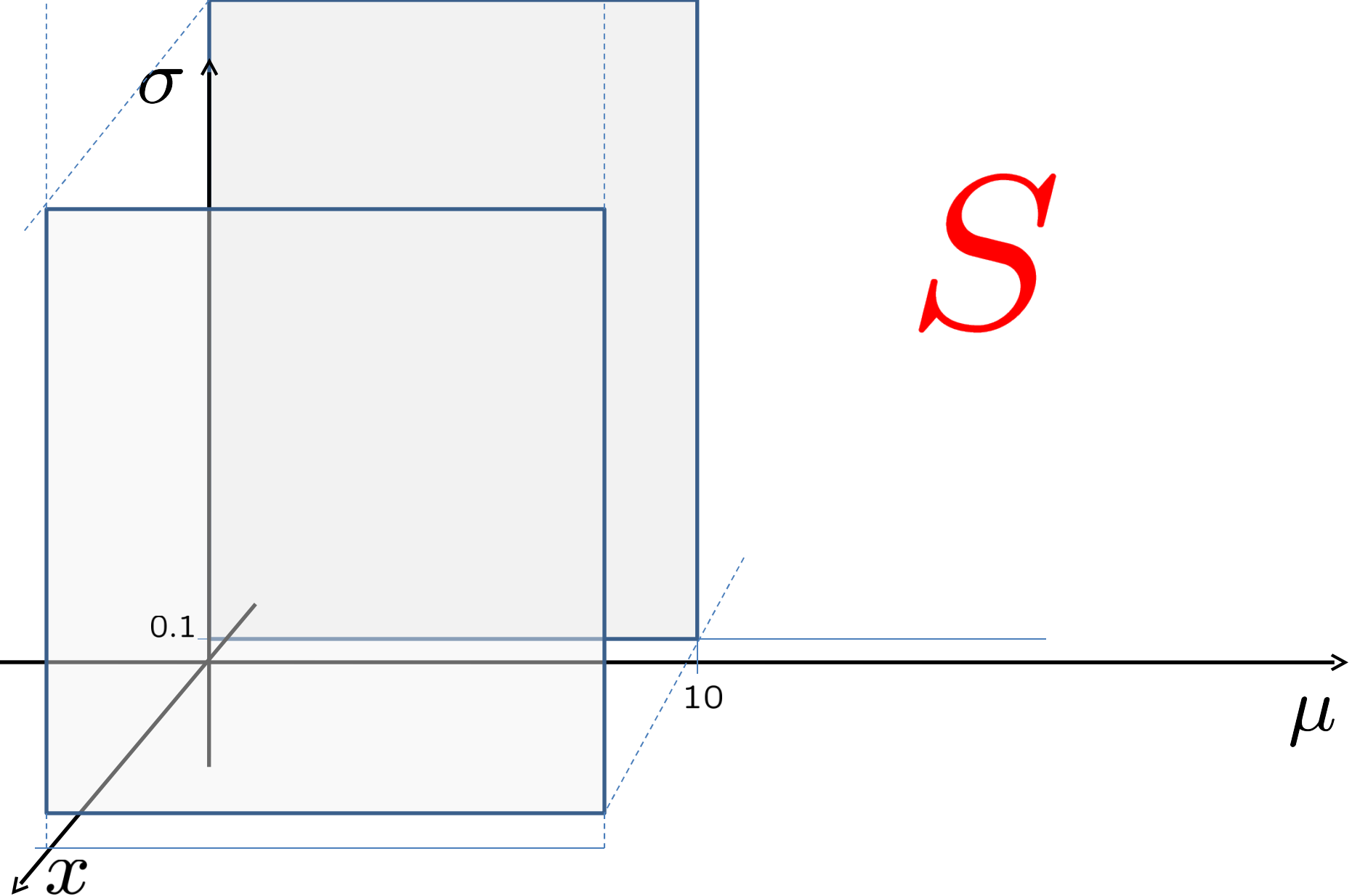


A wide-angle landscape photograph of a mountain valley. In the foreground, a river winds through a lush green valley, flanked by dense evergreen forests. A golf course is visible on the right side of the valley. The middle ground shows rolling hills and more forested areas. In the background, a range of rugged mountains stretches across the horizon, with several prominent peaks covered in snow. The sky is a clear, vibrant blue, dotted with scattered white clouds. The overall scene is bright and scenic, typical of a high-altitude mountain environment.

Inference



$$R \times \Theta = (-\infty, \infty) \times (0, 10) \times (0.1, \infty)$$

MLE fails

$$n = 1, x_1 = x$$

$$\log p(x|\theta) = -\frac{(x - \mu)^2}{2\sigma^2} - \log \sigma - \log \sqrt{2\pi}$$

$$0 < \mu < 10$$

$$\sigma > 0.1$$

$$\hat{\theta} = (\hat{\mu}, \hat{\sigma}) = (x, 0.1), \text{ if } 0 < x < 10 \quad \text{overfits!}$$

no error
bars!

Bayesian recipe fails

$$p(\theta) d\theta \propto d\mu \cdot \frac{d\sigma}{\sigma}$$

$$\int_{\Theta} \frac{d\mu d\sigma}{\sigma} = 10 \int_{0.1}^{\infty} \frac{d\sigma}{\sigma} = \infty$$

improper!

$$p(\theta|x) \propto \frac{1}{\sigma} \varphi\left(\frac{\mu - x}{\sigma}\right) \cdot \frac{1}{\sigma}$$

$$\int_{0.1}^{\infty} p(\theta|x) d\sigma \propto \frac{\Phi(-5|\mu - x|)}{|\mu - x|}$$

improper!



MLE

$\hat{\theta}$

\propto

$d\mu$

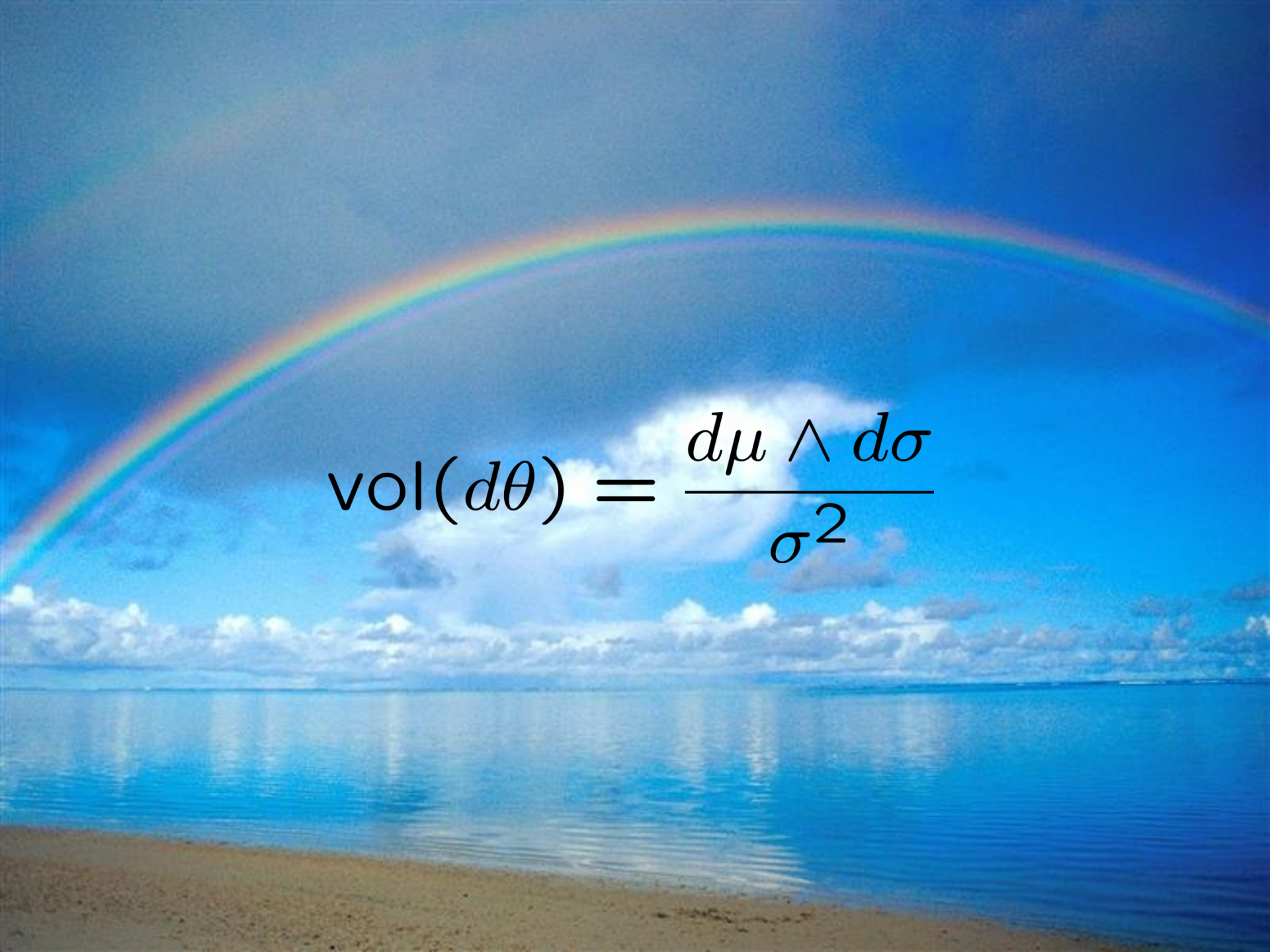
$n \rightarrow \infty$

$\frac{d\sigma}{\sigma}$

Wrong!

Wrong!

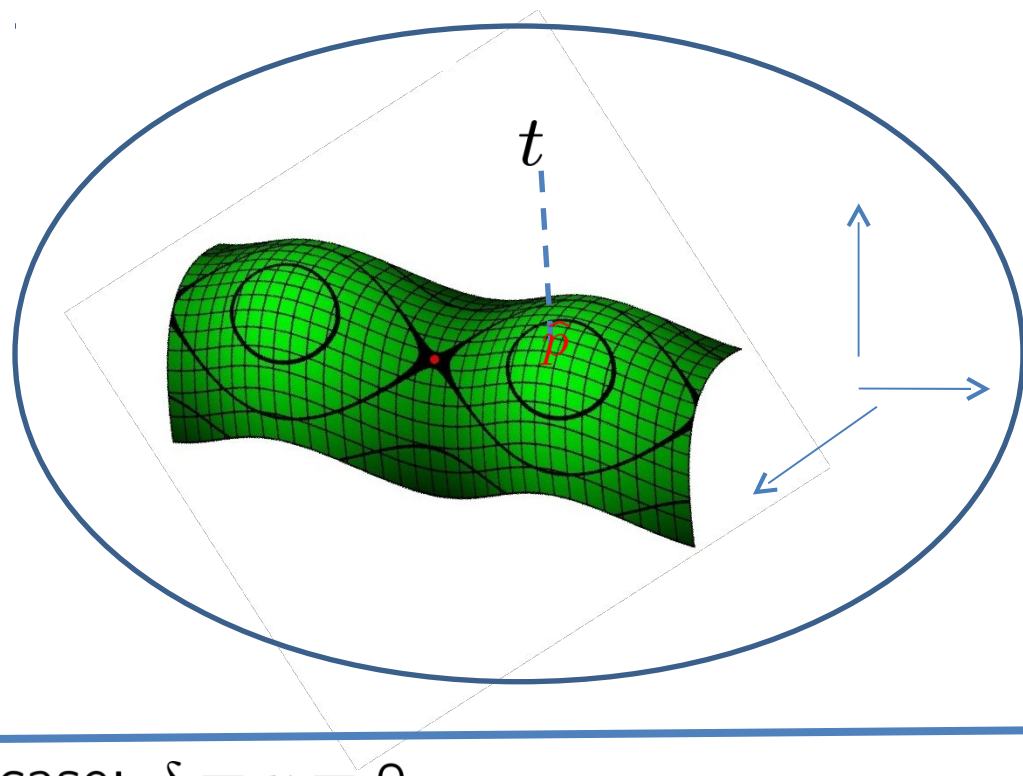
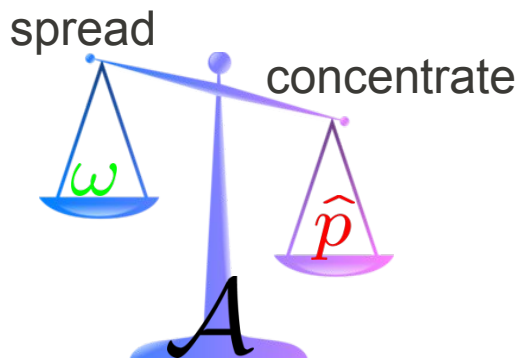
The honest
answer


$$\text{vol}(d\theta) = \frac{d\mu \wedge d\sigma}{\sigma^2}$$

$$A = \alpha I_\delta(p\pi : t\pi) + I_{1-\nu}(\omega : \pi)$$

\uparrow
 (x, p) independent!

Ignorance = Independence & Uniformity

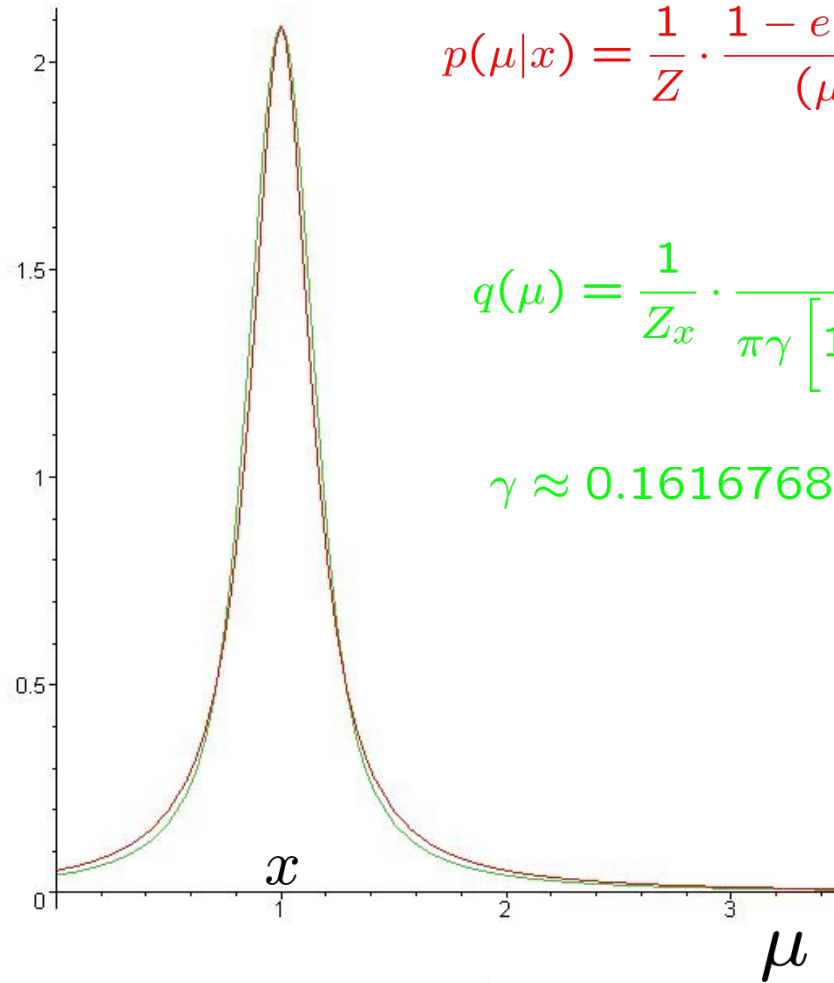


Special case: $\delta = \nu = 0$

$$\alpha \langle I_0 \rangle = I(t^\alpha \pi : p^\alpha \pi) \geq I(t^\alpha \delta_{\hat{p}} : \hat{p}^\alpha \delta_{\hat{p}})$$

\uparrow
 (x, p) independent!

$$A = I(t^\alpha \pi : p^\alpha \omega)$$



$$p(\mu|x) = \frac{1}{Z} \cdot \frac{1 - e^{-50(\mu-x)^2}}{(\mu-x)^2}$$

$$0 < \mu < 10$$

$$q(\mu) = \frac{1}{Z_x} \cdot \frac{1}{\pi\gamma \left[1 + \left(\frac{\mu-x}{\gamma} \right)^2 \right]}$$

$$\gamma \approx 0.1616768$$



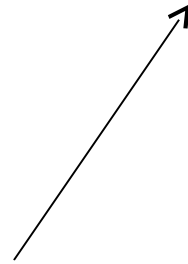
Info

born



Past
singularity

you are
here!
bio is
here!
the universe is
here!



dead



Future
singularity

A wide-angle landscape photograph of a mountain valley. In the foreground, a river winds through a lush green valley, flanked by dense evergreen forests. A golf course is visible on the right side of the valley. The middle ground shows rolling hills and more forested areas. In the background, a range of rugged mountains stretches across the horizon, with several prominent peaks covered in snow. The sky is a clear, vibrant blue, dotted with fluffy white clouds. The overall scene is bright and scenic, typical of a high-altitude mountain environment.

Inference