

Radioactivity Quantitatively

Decays per second,
or “activity”

$$\frac{\Delta N}{\Delta t} = -\lambda N$$

No. of nuclei
present

decay constant

Survival:

$$N(t) = N_0 e^{-\lambda t}$$

No. of nuclei
present at time t

No. we started
with at $t=0$

Instead of base e we can use base 2 :

$$e^{-\lambda t} = 2^{-\frac{t}{T_{1/2}}}$$

where

$$T_{1/2} = \frac{0.693}{\lambda}$$

Half life

Then we can write

$$N(t) = N_0 e^{-\lambda t} = N_0 \cdot 2^{-\frac{t}{T_{1/2}}}$$