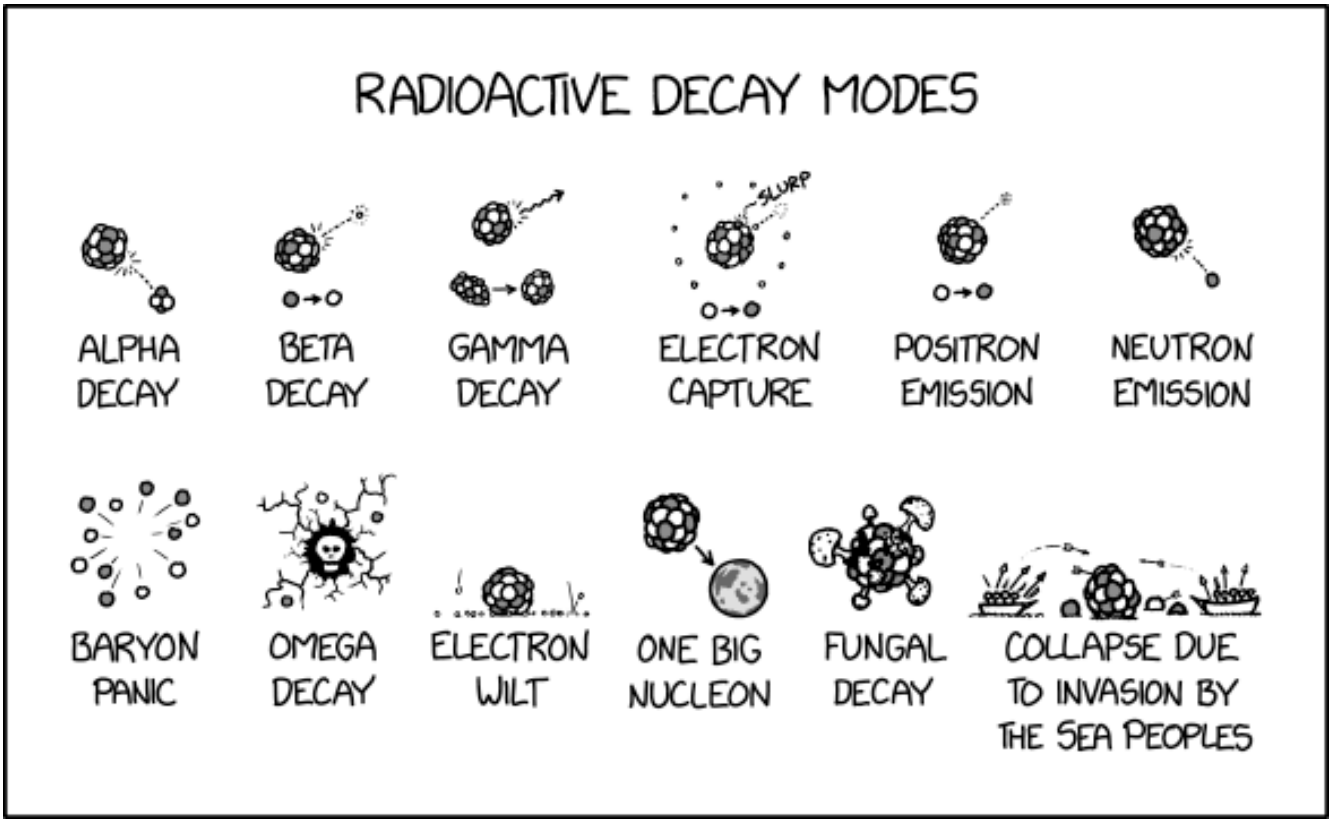
HOMEWORK SET 26: RADIOACTIVITY
Due Friday, April 25, 2025

PROBLEMS FROM OR AFTER TZDII[1]

17.7) a) Given that ^{238}U has a half life of 4.47 x 10^9 years, find its decay constant, r.
b) How many atoms are there in 1 g of pure ^{238}U?
c) How many decays are there per scond in 1 g of ^{238}U?

17.17) The carbon in living organisms conaains about 1.3 atoms of ^{14}C for every 10^{12} atoms of all kinds of carbon and the half-life of ^{14}C is 5730 years.
a) How many decays would one expect per minute from 7 g of carbon taken from a living tree?
b) If 7 g of carbon is extracted from a wooden beam of a prehistoric dwelling and if the undrgo 10 decays per minute, about how old is the dwelling?

17.18) a) At what rate would 2 g of carbon from a living organism eject electrons?
b) If archeologists extract 2 g of carbon from a dog's skull and count 21 electrons ejected per minute, how long ago did the dog die?



[1] Taylor, Zafiratos, & Dubson, *Modern Physics for Scientists and Engineers*, 2nd Editon, Pearson, Prentice Hall, 2004