

PHY 422/622 : ASSIGNMENT IV (DUE APRIL 18, 2017)

- (1) Assume you have a series of nuclear decays, with different decay constants,

$$1 \rightarrow 2 \rightarrow \dots \rightarrow k \rightarrow \dots \rightarrow N$$

If one initially starts with just N_0 nuclei of type '1' above, derive an expression for the activity of the k-th member of the chain. These are called the *Bateman equations*. [Hint : Look at a few special cases, notice any patterns, and just generalise.]

- (2) Write the terms in the Bethe-Weizsäcker formula. Motivate and explain each term in a few lines.