Homework 7

Complete Part I first, by taking notes that you will keep for yourself. (*Do not turn these in.)* Type up your answers to each of the questions in Part II and submit it in one double-spaced, Word document with your name on the top under the title. Use 12-point Times New Roman Font with 1" margins on all sides. If you have to do a calculation, solve the problem by hand on a separate sheet of paper. Then take a picture of your work and paste it into your word document in an appropriate place. When you are done upload this into the Dropbox on Blazeview. If you are unable to use Word for the assignment, you may use another software package and upload a pdf instead.

PART I: Notes

1. Read and take notes on the video "Nuclear Energy".

PART II: Assignment (25 points total)

1. Define the following terms (1 point each)
    a. Binding energy
    b. Atomic number
    c. Radioactive decay
    d. Neutrino
    e. Tokomak
2. How can you determine if a nuclide is fissionable? (4 *points*)
3. In your own words, describe the three difficulties standing in the way of a working reactor. (4 *points*)
4. What was the gold foil experiment? (5 points)
5. What is a half life-time if the decay energy is 62,000 J? (3 *points*)
6. Using the table below determine the mass excess and effective radius for plutonium (Pu) and lithium (Li). (4 *points*)

Nuclide	Z	N	A	Stability[a]	Mass[b] (u)
^{1}H	1	0	1	99.985%	1.007 825
^{7}Li	3	4	7	92.5%	7.016 004
^{31}P	15	16	31	100%	30.973 762
^{84}Kr	36	48	84	57.0%	83.911 507
^{120}Sn	50	70	120	32.4%	119.902 197
^{157}Gd	64	93	157	15.7%	156.923 957
^{197}Au	79	118	197	100%	196.966 552
^{227}Ac	89	138	227	21.8 y	227.027 747
^{239}Pu	94	145	239	24 100 y	239.052 157