1 questions

1.1 What is exactly $\alpha\beta\gamma$ radiation ? can we get an example for each one and maybe a equation related

1.1.1 αradiation - hydrogen atoms of 2 protons and 2 neutrons

1.1.2 βradiation - electron or positron. and get also neutrino or antineutrino

1.1.3 γradiation - photon mostly $10^{20}Hz$ depends on bond energy.

1.2 it the paper of iati and alona what is hatah peaula ?

1.3 figure 1 in paper - can we understand it ?.

2 Importat equation

2.1 Photon energy and frequency

$$E = h\nu$$

where E is energy. h is planck's cons and ν is frequency

3 Answers to the mail questions:

3.1 ***size of nucleus !!***

3.2 ** protons neutrons mass spin magnetic moment charge

3.3 the force that want to destroy the nucleus is the electric force and what keep it is strong force

3.4 radioactive - radiation stat ? what

3.5 the radiations $\alpha\beta\gamma$ comes from fusion and fission reactions **how the radiation absorbed in material ?*** only ionizing ??

3.6 which conservation lows occur in the interaction between gamma radiation and the material ? .

4 Explantion to the mail concepts list

4.1 bohr model - planetar model, like rutherfords model but !. it can only orbit in distance which make the angular momentum a complete number of plancks reduced constant

$$L = n\hbar$$

4.2 time-indepedent scherdinger eq for hydrogen atom is

$$\left[\frac{-\hbar^2}{2\mu}\nabla^2 + V(|\mathbf{r}|)\right]\Psi(\mathbf{r}) = E\Psi(\mathbf{r})$$

where the hemiltonian is the energy of the electron and the potential is columb potenail. from writing the laplacian in polar coordinates we get the eign states to be in the form of

$$|\psi\rangle = R_{nl}(r)\, Y_\ell^m(\theta,\phi)$$

and the radial function is

$$R_{n\ell}(r) = \sqrt{\left(\frac{2}{na_0}\right)^3 \frac{(n-\ell-1)!}{2n\left[(n+\ell)!\right]}} e^{-\frac{r}{na_0}} \left(\frac{2r}{na_0}\right)^\ell \left[L_{n-\ell-1}^{2\ell+1}\left(\frac{2r}{na_0}\right)\right]$$

where L is the lager polinoms

4.3 atomic nucleus models

4.3.1 liquid drop model - the protons and nitrons act like an atom in a drop of liquid. the power that the atoms on the surface feels are different from those who are inside drop feels. this model predicts well the bonds energies but does not exlains *** why are they drops of water ???*** i think the strong power is what analgous to bonds between atoms in a drop of water or something like that...

let the nucle have Z protons and N neutrons so $A = Z + N$ so the mass is

$$m = Zm_p + Nm_n - \frac{E_B}{c^2}$$

where $E_B$is the binding energy and it is

$$E_B = a_V A - a_S A^{2/3} - a_C \frac{Z(Z-1)}{A^{1/3}} - a_A \frac{(A-2Z)^2}{A} + \delta(A,Z)$$

and each elemet is measured in lab and the terms are:Volume,Surface,Coulomb,Asymm and paring energy

4.3.2 shell model - like the model of the atom but now the potential is not coloumb. still we have harmonic oscillator which the protns and neutrons can occupay. this model explains the number of protons and neutorns we find stable

4.4 nuclear fusion - two nucleus makes togather a new one and by the way can be emitted some $\alpha\beta\gamma$ radiation. a photo example is the folder from wikipedia

4.5 nuclear fission - one nucleus seperates into two smaller one and it can obserbe or emitt radiation

4.6 Stars nuclear process - in our sun mostly fusion of hydrogen to isotop 4

4.7 periodic table - o.k.. we know her

4.8 nuclear disasosiation - do you mean radioactivic materials ?

4.9 material interaction - γ radiation can ionizes matreials by taking their electron out
**** should read the report again and see what interaction can be in germanium that makes him a decetor****

4.10 NP junction in germanium - ***Have to understand better why only one way of voltage is ok and the other is not and how come that after the current the junction stay the same*** *** is there is a threshold for the voltage of the NP diode ??***

4.11 Germanium detector is an NP diode that only an electron who gets enough energy can cross the barrier and produce current so we know there was γ radiation

4.12 Ge(Li) is Ge doped with lithium to create the area we want for the NP.