Nuclear physics

A-Level Physics · Vocabulary in context

Word	Example
mass-energy equivalence /mæs ˈenədʒi ɪˈkwɪvələns/	**Mass-energy equivalence** says $E = mc^2$. $E = mc^2$
energy /ˈenədʒi/	Food gives your body the **energy** it needs to move.
nuclear fusion /ˈnjuːklɪə ˈfjuːʒn/	**Nuclear fusion** powers the Sun.
luminosity /ˌluːmɪˈnɒsɪti/	The **luminosity** of a star is its total power.
nuclear reaction /ˈnjuːklɪə rɪˈækʃn/	A **nuclear reaction** changes one nucleus into another.
nucleon number /ˈnjuːklɪən ˈnʌmbə/	The **nucleon number** counts protons and neutrons.
conservation of charge /ˌkɒnsəˈveɪʃn ɒv tʃɑːdʒ/	**Conservation of charge** means charge is never lost.
neutron /ˈnjuːtrɒn/	A **neutron** has no charge.
proton /ˈprəʊtɒn/	A **proton** has a positive charge.
positron /ˈpɒzɪtrɒn/	A **positron** is like an electron with a positive charge.
neutrino /njuːˈtriːnəʊ/	A **neutrino** has almost no mass.
nucleus /ˈnjuːklɪəs/	The **nucleus** is at the centre of an atom.
mass defect /mæs ˈdiːfekt/	The **mass defect** is the mass lost when a nucleus forms.

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binding energy /ˈbaɪndɪŋ ˈenədʒi/	The **binding energy** holds the nucleus together.
binding energy per nucleon /ˈbaɪndɪŋ ˈenədʒi pɜː ˈnjuːklɪən/	Iron has the highest **binding energy per nucleon**.
nuclear fission /ˈnjuːklɪə ˈfɪʃn/	**Nuclear fission** splits a big nucleus into two.
kinetic energy /kɪˈnetɪk ˈenədʒi/	A fast car has a lot of **kinetic energy**.
electrostatic /ɪˌlektrəʊˈstætɪk/	Two charged balls push apart with an **electrostatic** force.
strong nuclear force /strɒŋ ˈnjuːklɪə fɔːs/	The **strong nuclear force** holds protons and neutrons together.
chain reaction /tʃeɪn rɪˈækʃn/	Each fission starts more fissions in a **chain reaction**.
critical mass /ˈkrɪtɪkl mæs/	Above the **critical mass**, the chain reaction keeps going.
recoil /rɪˈkɔɪl/	A gun moves back when it fires; we call this **recoil**.
half-life /hɑːf laɪf/	After one **half-life**, half the nuclei have decayed.
decay constant /dɪˈkeɪ ˈkɒnstənt/	A large **decay constant** means fast decay.
activity /ækˈtɪvɪti/	The **activity** is the number of decays each second.
random /ˈrændəm/	Decay is **random**: we cannot say which nucleus decays next.
spontaneous /spɒnˈteɪnɪəs/	Decay is **spontaneous**: nothing outside makes it happen.

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count rate /kaʊnt reɪt/	The **count rate** is 120 counts per minute. 120
Geiger counter /ˈgaɪgə ˈkaʊntə/	A **Geiger counter** clicks when radiation arrives.
radionuclide /ˌreɪdiəʊˈnjuːklaɪd/	A **radionuclide** has an unstable nucleus.
becquerel /ˈbekwərəl/	One **becquerel** is one decay per second.
exponential decay /ˌekspəˈnenʃl dɪˈkeɪ/	The charge falls by **exponential decay**.
background radiation /ˈbækgraʊnd ˌreɪdɪˈeɪʃn/	**Background radiation** is all around us.
tracers /ˈtreɪsəz/	Doctors use **tracers** to follow blood in the body.

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