Neutrinos

- **Exercício 8** (do Griffiths de partículas):

3.19 Particle A, at rest, decays into particles B and C ($A \to B + C$).

(a) Find the energy of the outgoing particles, in terms of the various masses.

$$\left[\textit{Answer:}\ \ E_B = \frac{m_A^2 + m_B^2 - m_C^2}{2m_A} c^2 \right]$$

(b) Find the magnitudes of the outgoing momenta.

$$\left[\textit{Answer:}\ \ |\mathbf{p}_B| = |\mathbf{p}_C| = \frac{\sqrt{\lambda(m_A^2, m_B^2, m_C^2)}}{2m_A c,} \right]$$

where λ is the so-called *triangle function* :

$$\left[\lambda(x, y, z) \equiv x^2 + y^2 + z^2 - 2xy - 2xz - 2yz. \right]$$

Uma curiosidade histórica

† It is interesting to note that Bohr was an outspoken critic of Einstein's light quantum (prior to 1924), that he mercilessly denounced Schrödinger's equation, discouraged Dirac's work on the relativistic electron theory (telling him, incorrectly, that Klein and Gordon had already succeeded), opposed Pauli's introduction of the neutrino, ridiculed Yukawa's theory of the meson, and disparaged Feynman's approach to quantum electrodynamics. Great scientists do not always have good judgment – especially when it concerns other people's work – but Bohr must hold the all-time record.

Do Griffiths