The situation:
- We have two detectors (channels)
  - A particle (muon) will create a signal in both detectors, roughly at the same time
- The detectors produce noise signals as well
- If two noise signals overlap (we call this a random coincidence) we may think there was a particle.

The challenge:
- Identify the parameters of the setup that are relevant for the frequency of the random coincidences
- Develop a formula to compute the frequency of the random coincidences
- Propose a way for measuring the frequency of random coincidences with the equipment that we have

The prize:
The first student to present a correct solution to both problems (formula and measurement) will win a prize

The small print:
You can easily find solutions for both parts of the challenges on the Internet but I trust you that you will not google the solution but create it yourself
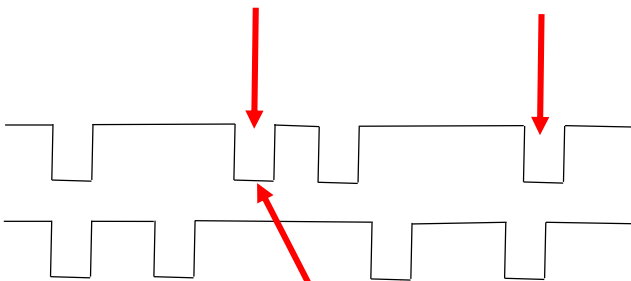
PMT, channel 1

PMT, channel 2

Particle

Noise (no signal in Channel 2)

Particle or coincident noise in both channels?

Channel 1

Channel 2

Pulses from the discriminator