CUBES for CREDO

By: Dmitriy Beznosko

Nazarbayev University

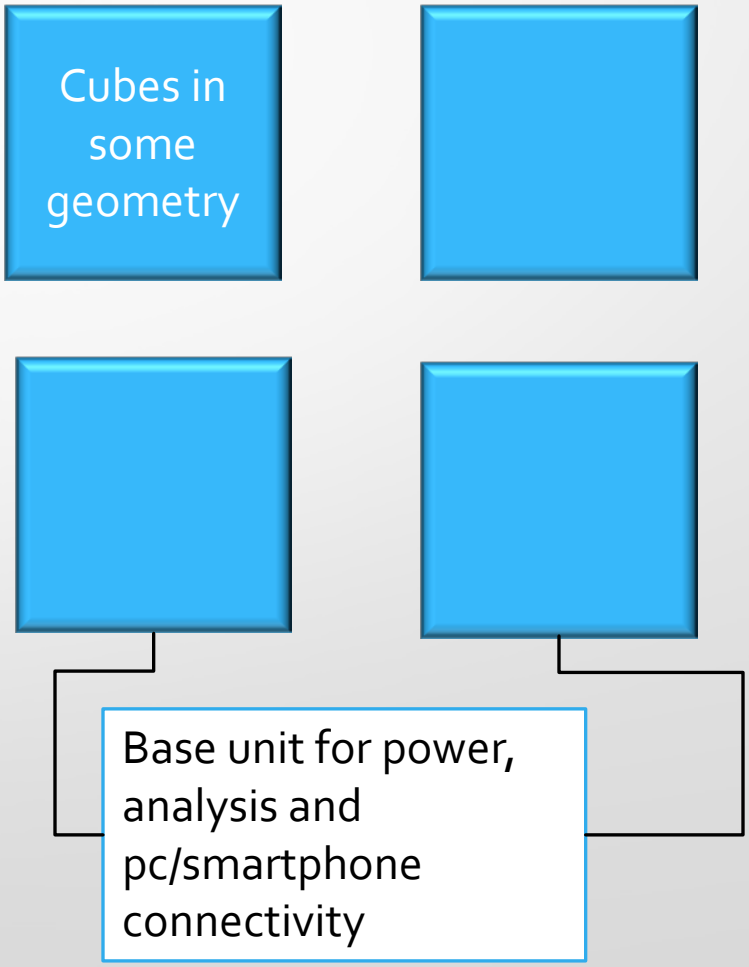
Astana, KZ

CREDO
THE QUEST FOR UNEXPECTED

Visegrad Fund

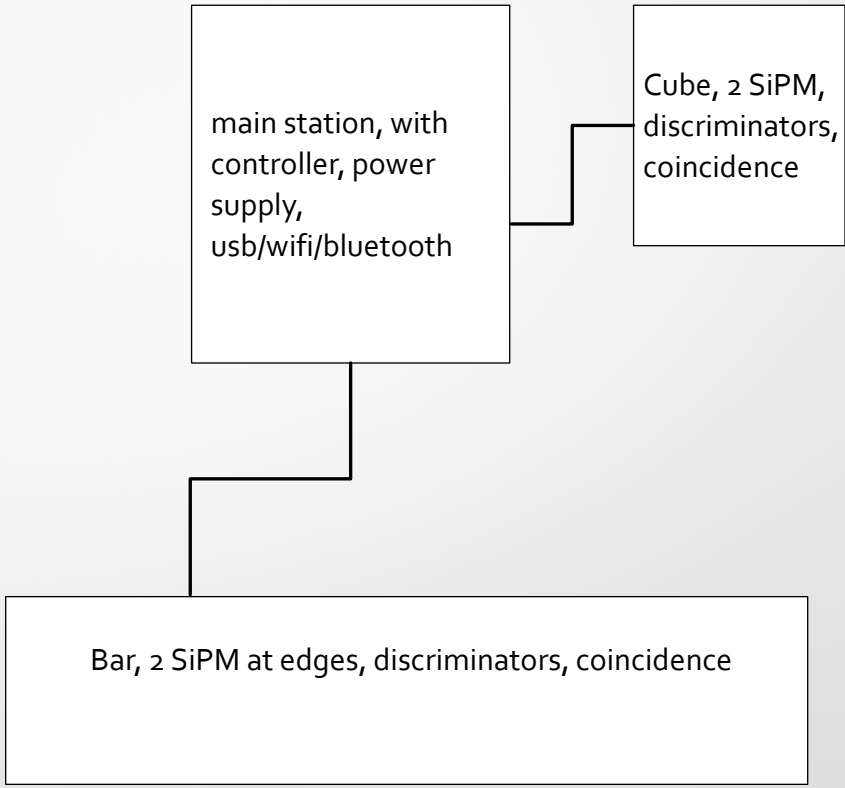
EAS and life

- Citizens science: target homes, schools and universities
- Simple, affordable yet powerful device capable of
  - Position
  - Particle flux
  - Direction information for EAS locally
  - Internet connectivity, educational app/software



Design details

- Cubes are about 10 cm^3
- Can also have 'bars' for school/univ. version for larger area (20x50x2cm? Larger?)
- Need main station and parts connecting to it.
- Need to connect to main station via cables or specially designed radio protocol to retain latency. Cables are best for constant delays.
- Main station supplies power to all connected cubes/bars.



Capabilities and cost estimation

- Timing precision of ~10ns
- Adjust coincidence window, get directional information, tracks reconstruction for muons
- Simple to operate, plug and play design
- Need about 4-6 cubes or 2-4 bars for operations
- Can be used for educational labs (muon lifetime etc)
- Cost estimate for base+5cubes ~$500; base+3 bars ~$350
- Software to draw tracks and provide informational/ educational modules/videos to users

Cell phone modules

- Can have ‘active’ cover for cell phones, larger area then camera sensor
- Usb power from cell phone, data analysis on the spot
- Cover with silicon strip or thin scintillator inside
- Another idea – charging station with particle detector.. Collects data to buffer, uses cell phone to send data(can be rather large, say like a small bed stand)