The art of science

The science in art

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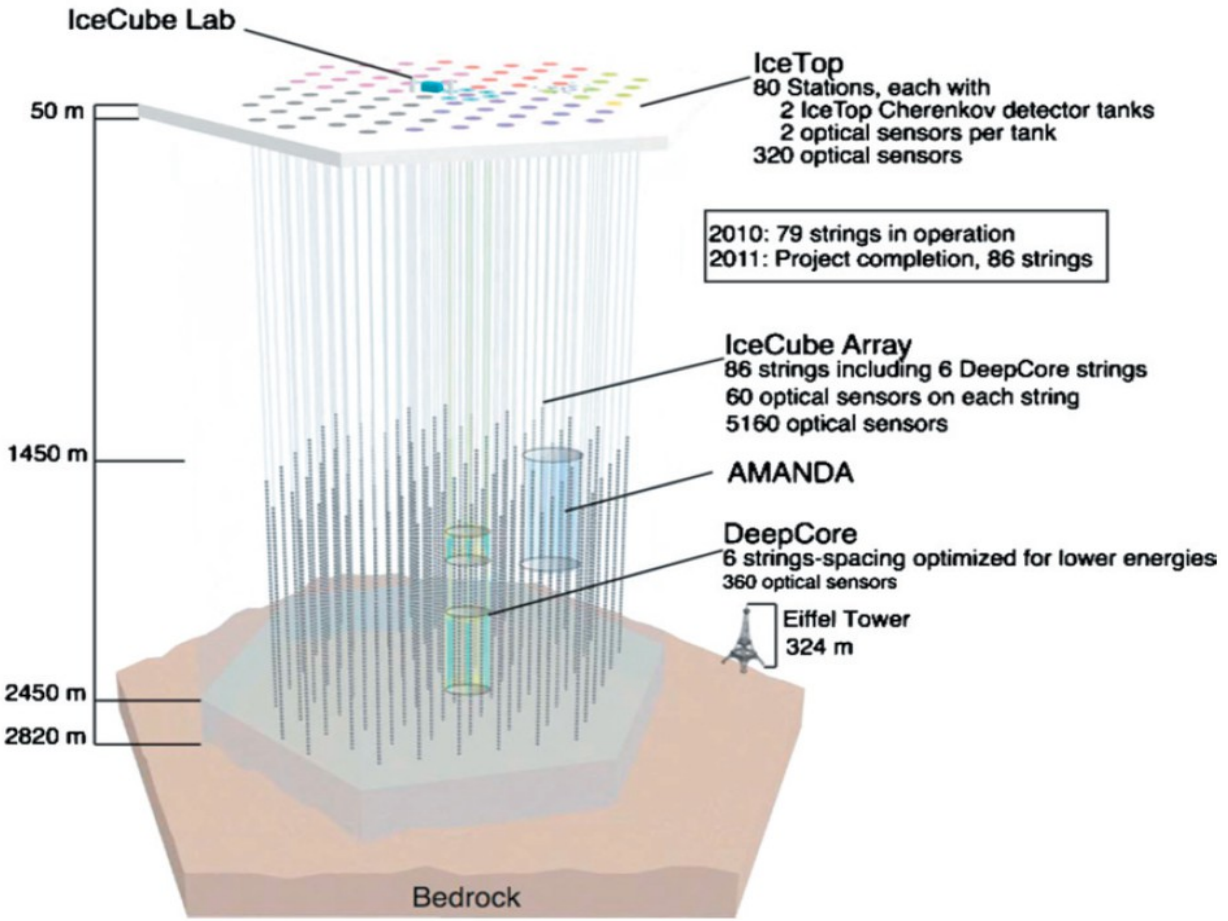
Idea and main assumptions

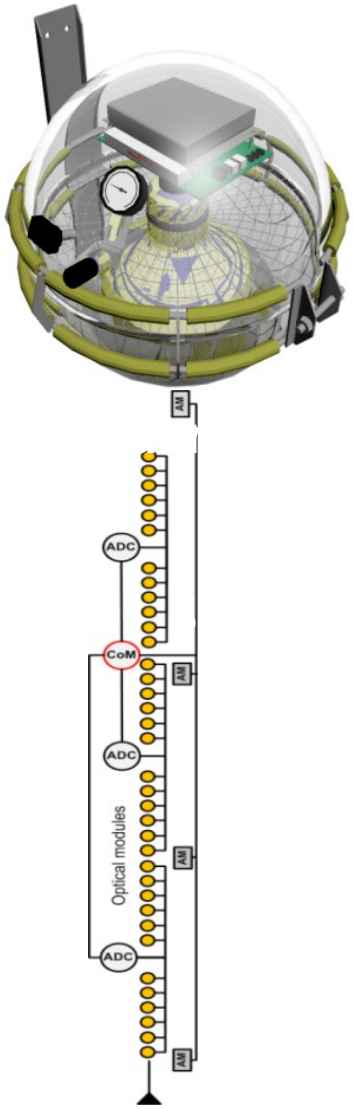
- **Proposition of spatial cosmic ray detector for CREDO**
- An elegant solution combining science and art
- The structure approximating the existing neutrino telescopes (Baikal GVD, IceCube)
- As simple, as possible construction
- Scalable, modular structure
- Low cost
- Easy to service and maintain

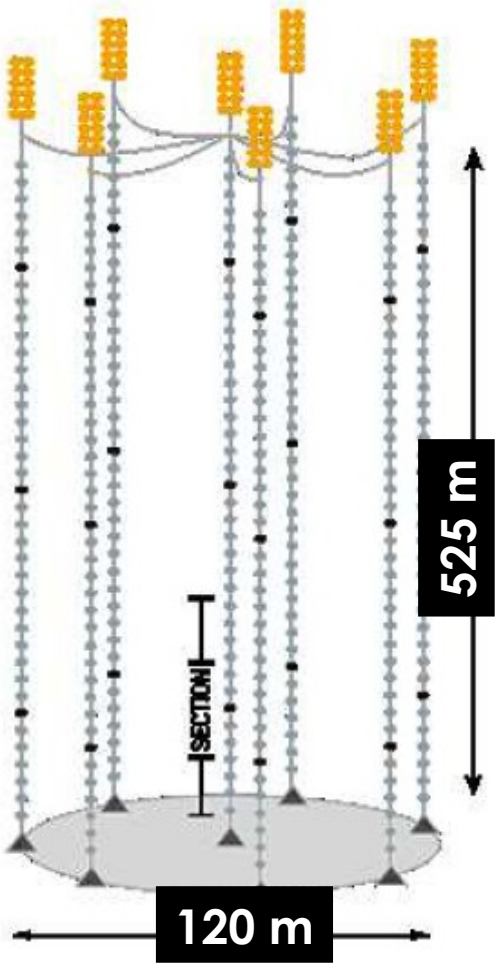
Proposed structure – hexagon
IceCube

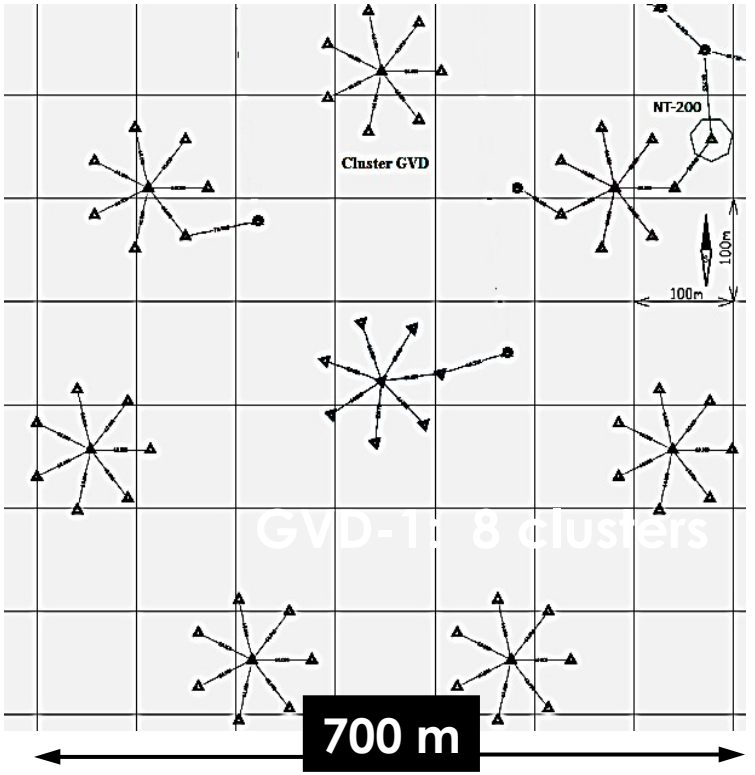


IceCube Science Team - Francis Halzen, Department of Physics, University of Wisconsin

Proposed structure – heptagon
BAIKAL GVD

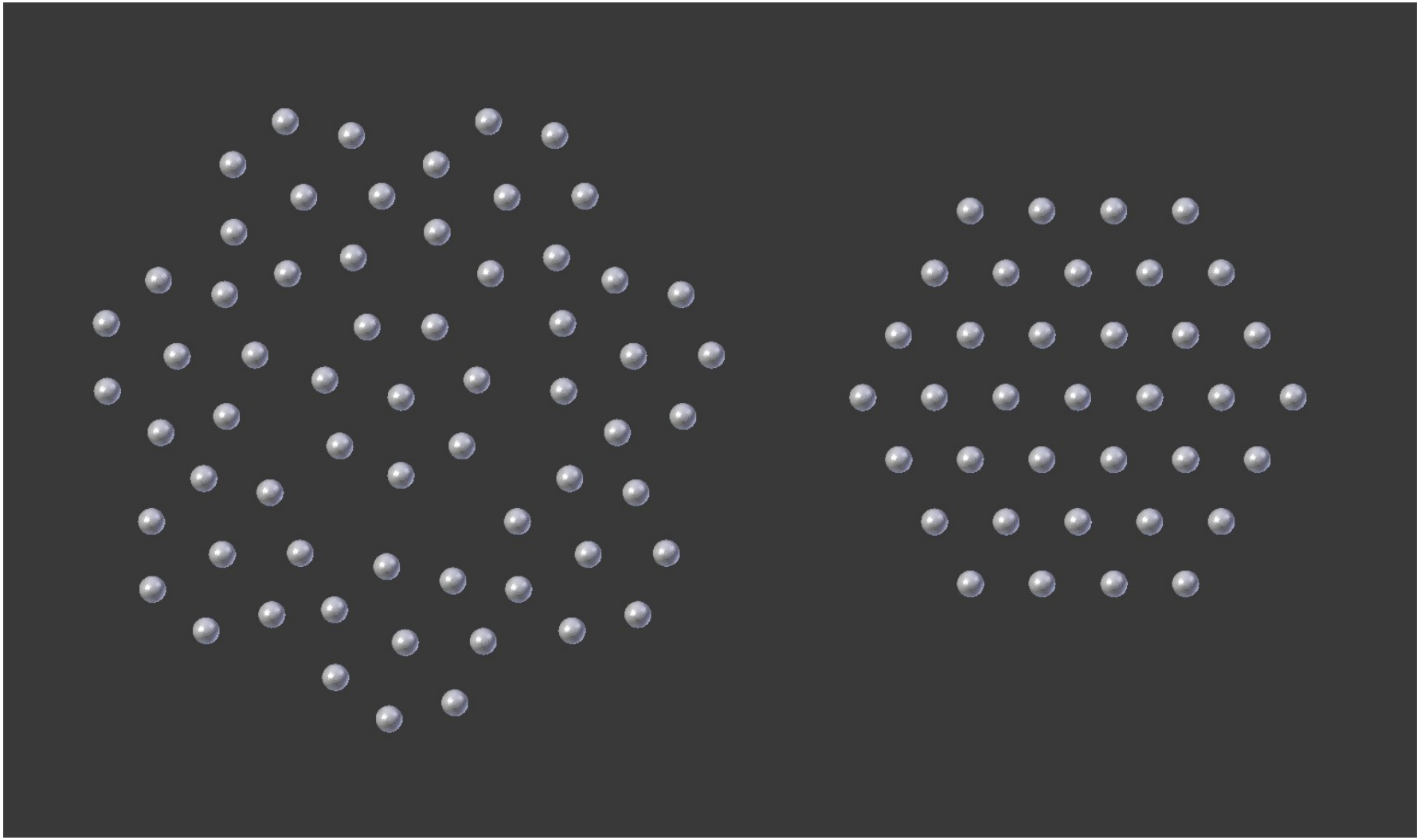




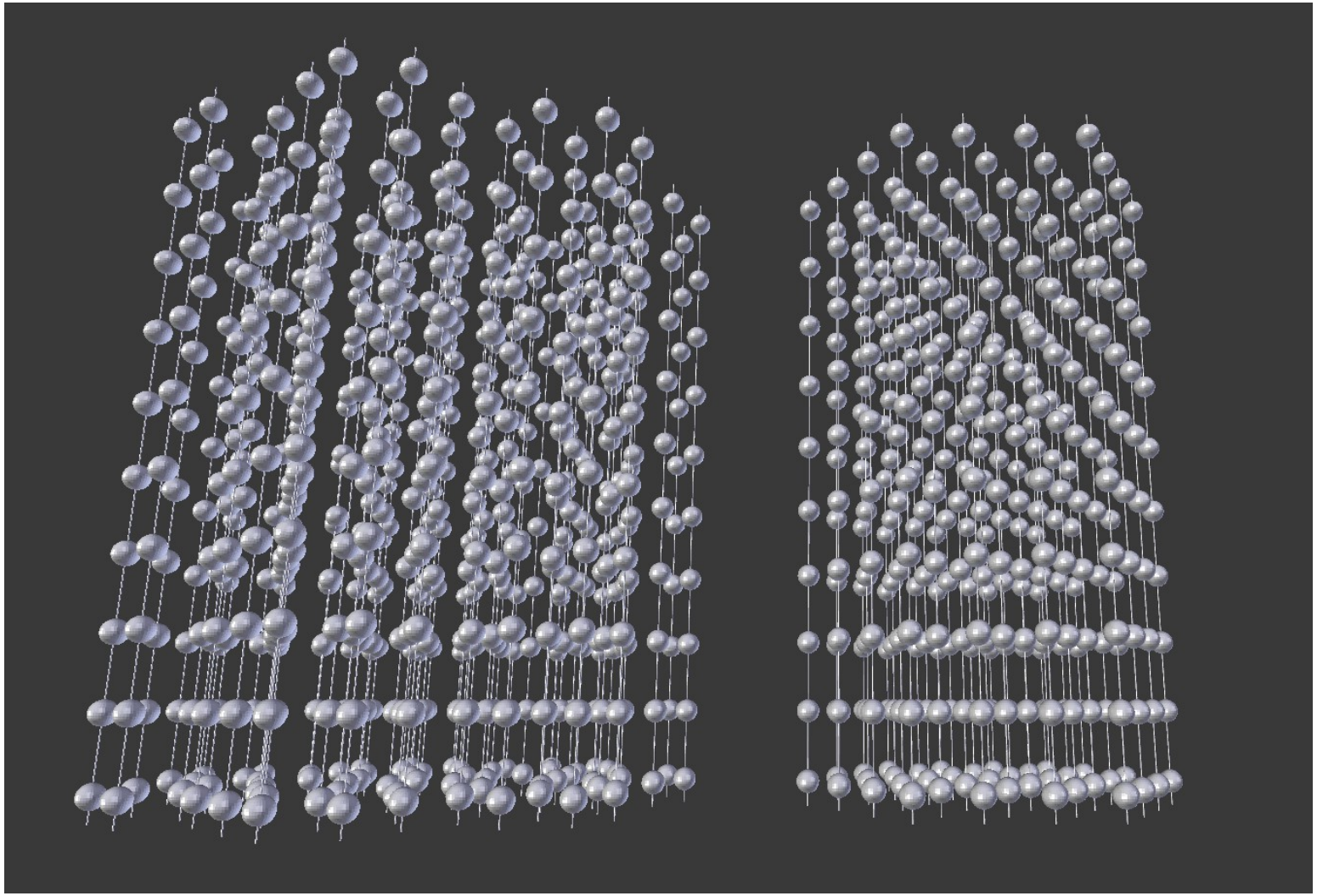


Zh.-A. Dzhilkibaev, INR (Moscow),
for the Baikal Collaboration
QUARKS-2018, October 07, 2018

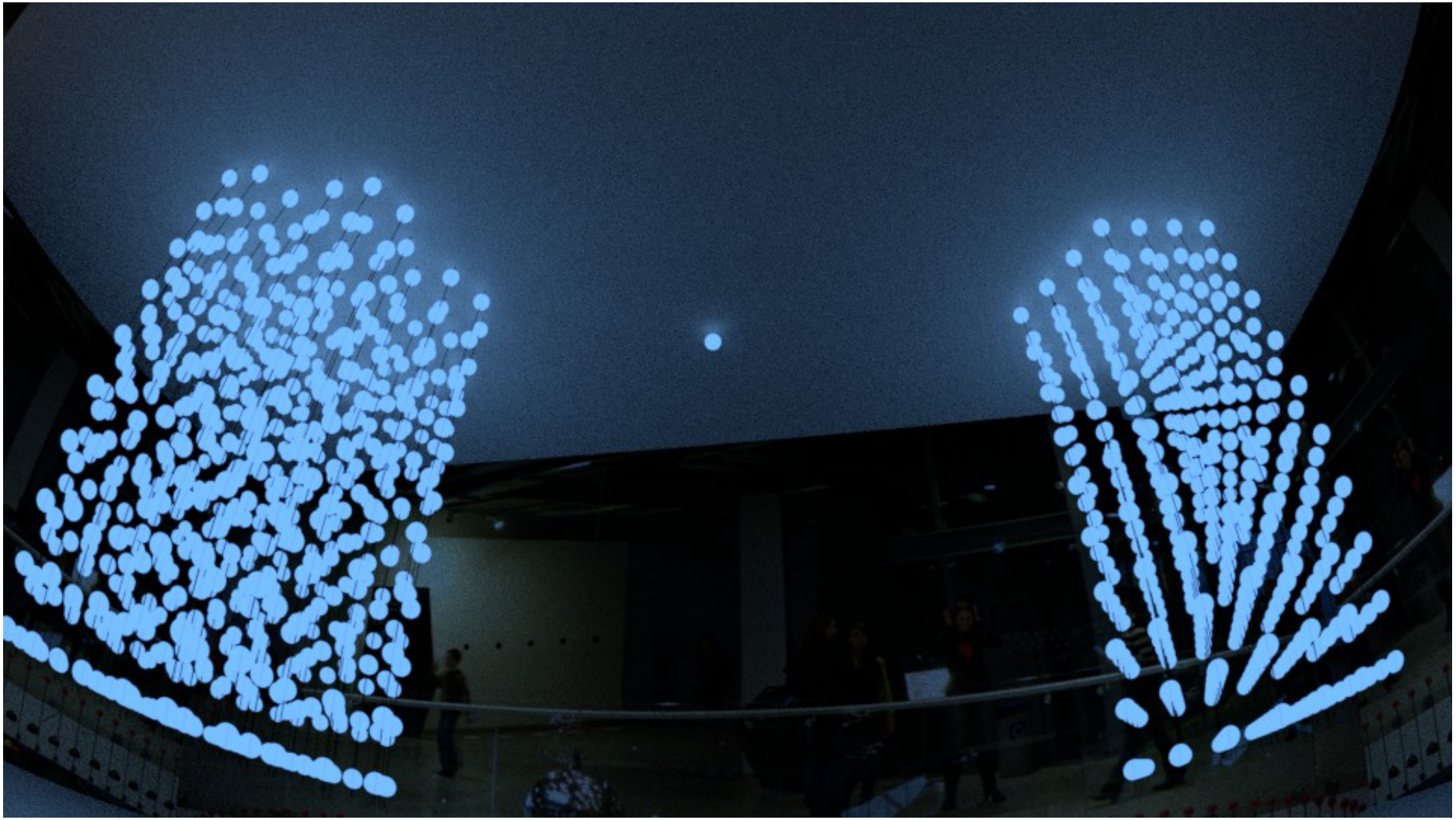
3D visualization - simulation



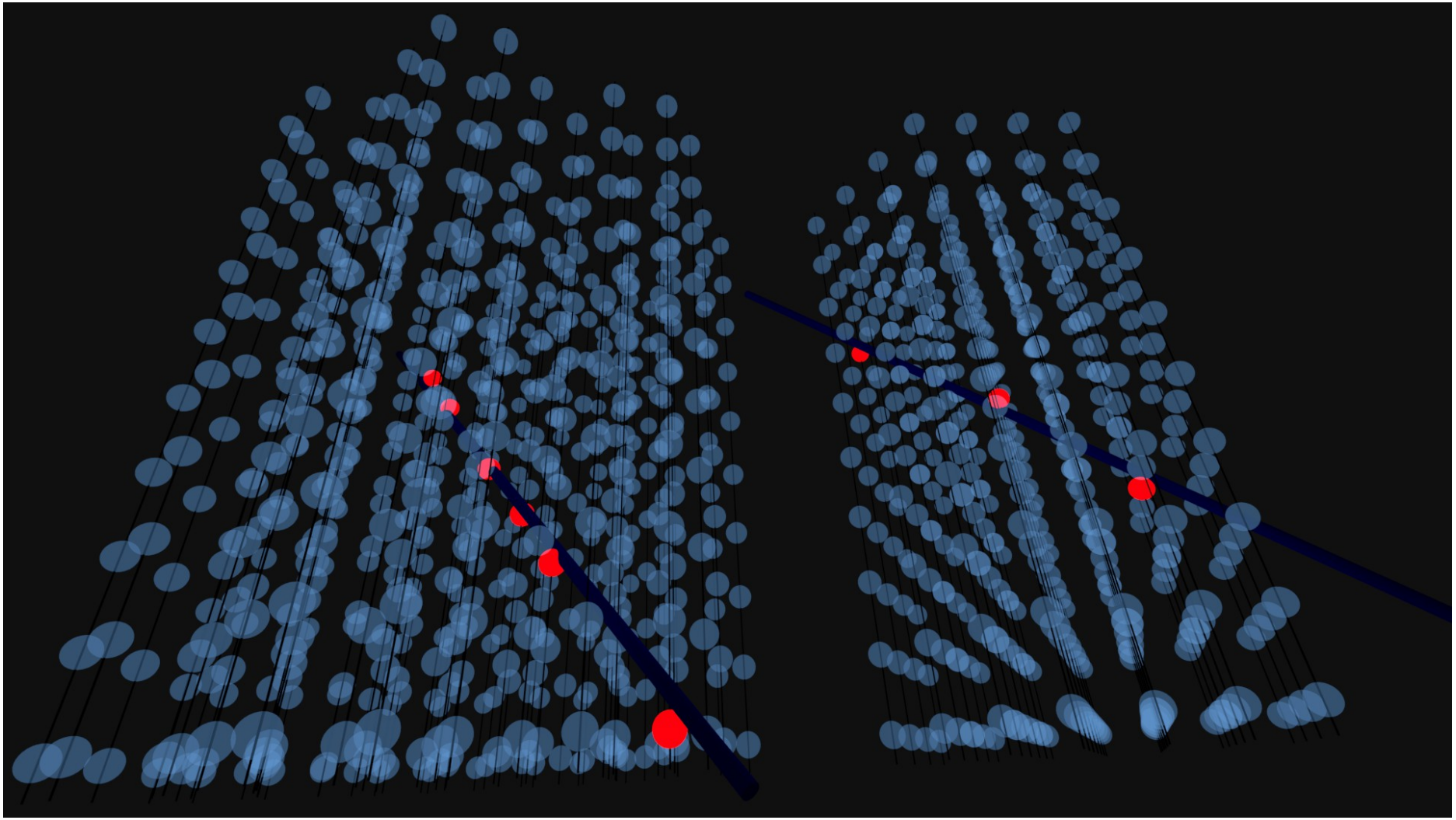
3D visualization - simulation



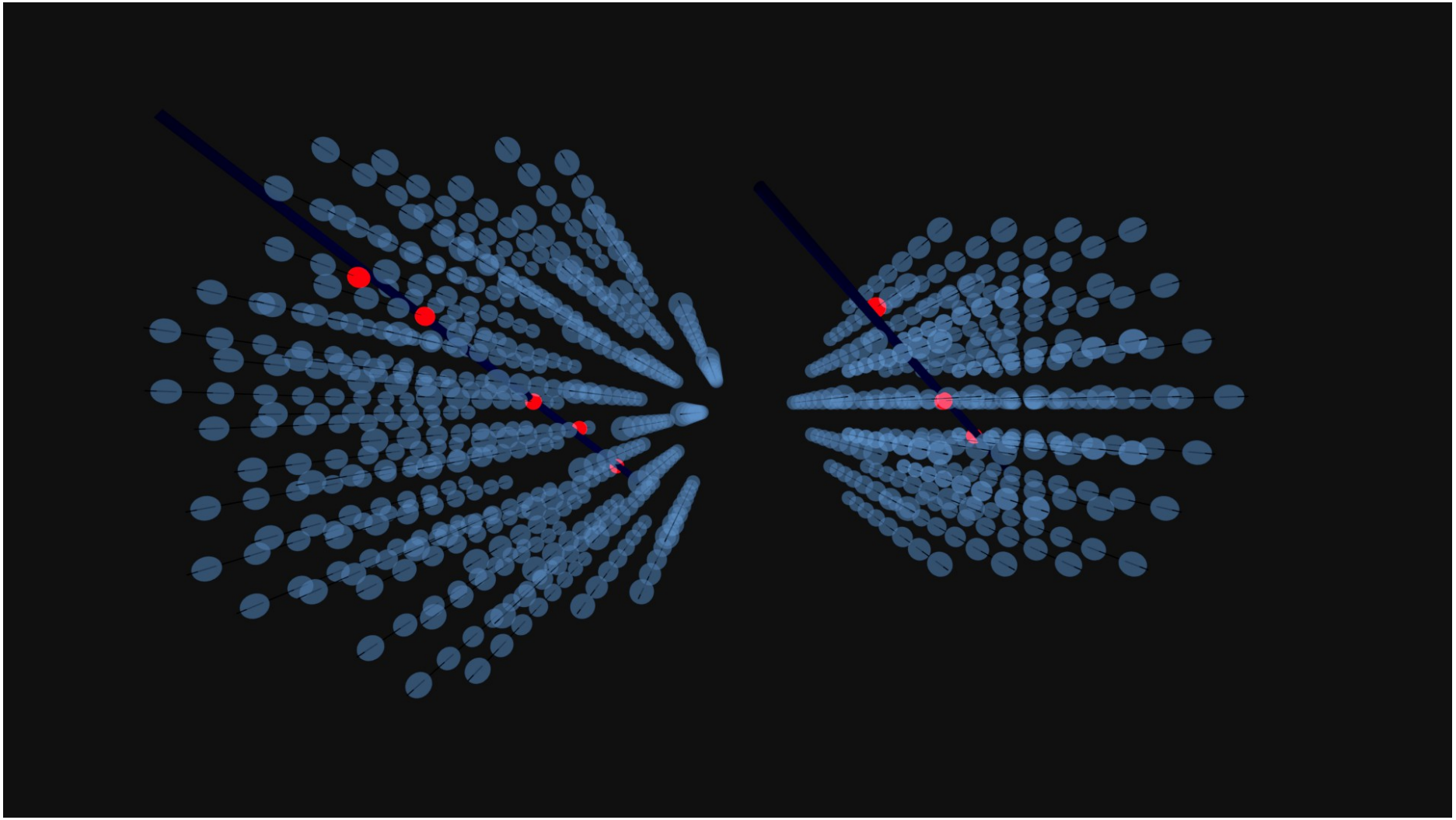
3D visualization - simulation



3D visualization - simulation



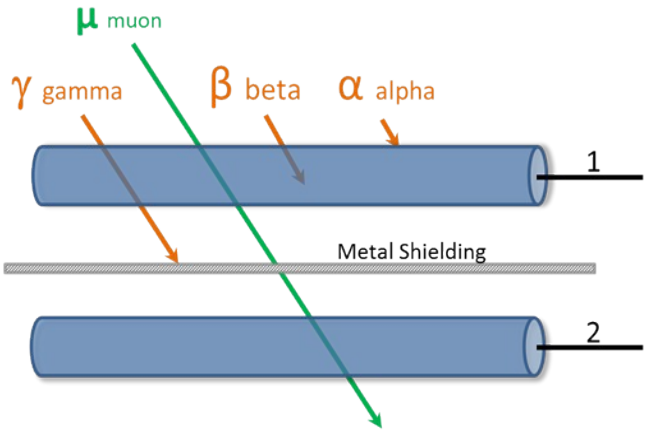
3D visualization - simulation



Basic components of single cluster

- Space
- Strings (6+1, 7+1)
- Wiring (including plugs)
- Control electronics
- Power supply (including HVPS)
- Detector module
- Mounting elements

detector module
detection method



muon	1	2
No	0	0
No	1	0
No	0	1
Yes	1	1

GEIGER-MÜLLER TUBES

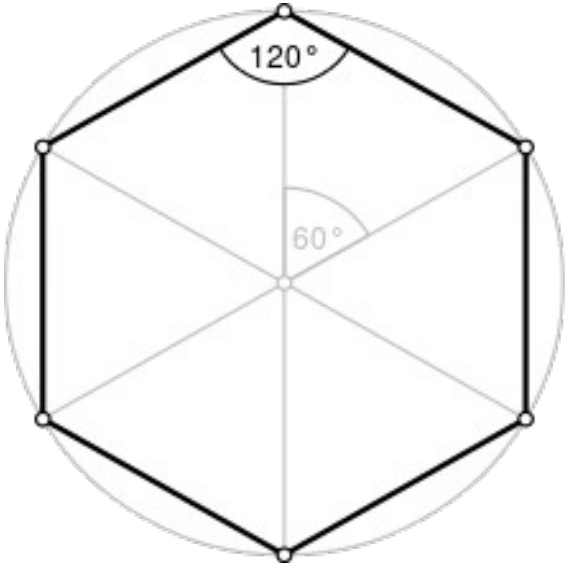
- *two Geiger tubes per module*
- *metal shield (lead separator)*
- *top-bottom coincidence in each module*

PANCAKE GM TUBE *(LND-7317)*

LINEAR GM TUBES

Cluster
assumptions

- 6 (7) + 1 string
- Power Supply Unit
- Control Unit

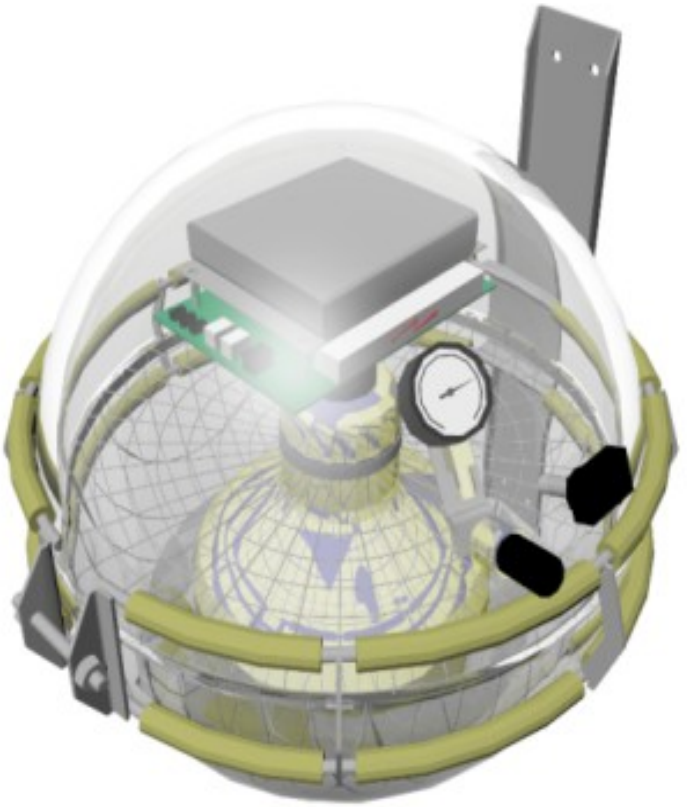


String
assumptions

- Steel rope
- 10 Detector Modules per each string
- Controller with comutator

Detector Module
assumptions

- Two plastic hemispheres
- Two GM tubes
- Lead shield
- Coincidence circuit
- PCB
- LED beacon (flash)



BAIKAL GVD Optical Module

Cost estimation

- **60 000 PLN** / central cluster (hexagon + 1)

  70 DM + infrastructure

  370 DM / telescope = **120 000 PLN**