1st Anniversary: Summary and Vision

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CREDO Anniversary Symposium, Kraków, 30.08.2017

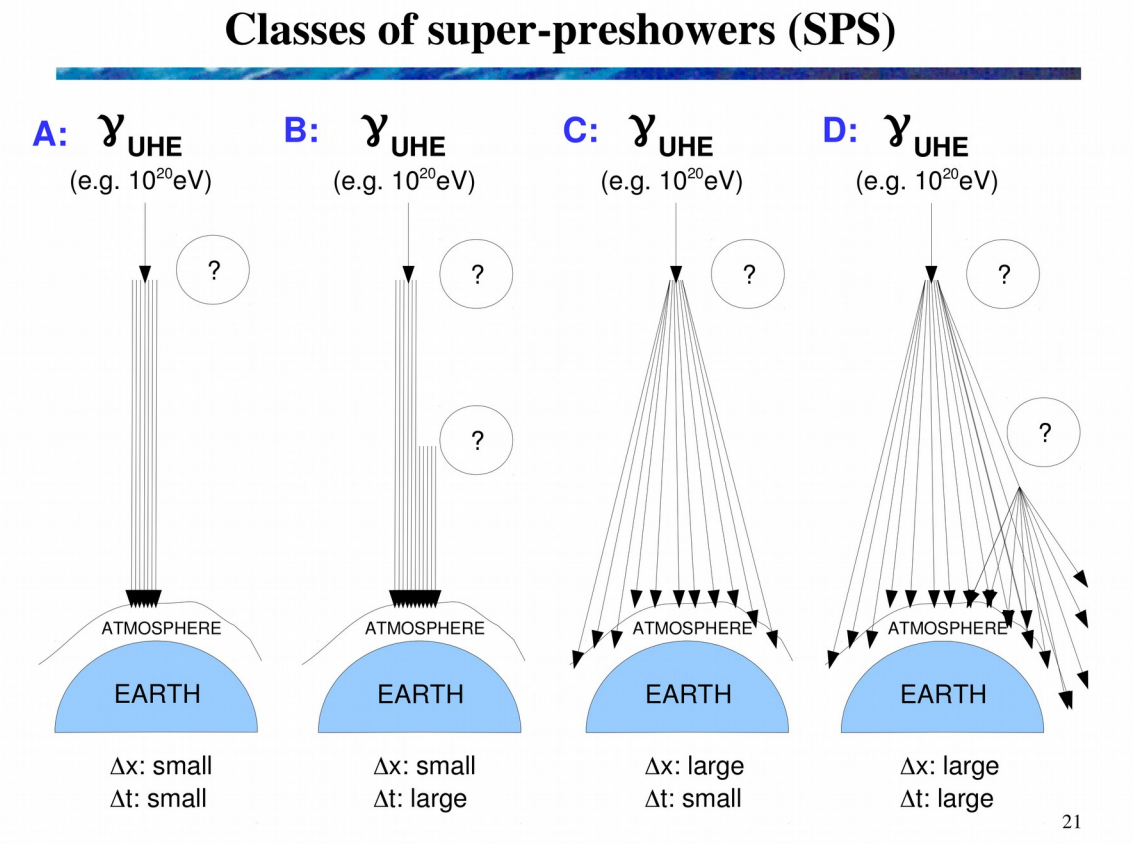
Global multi-disciplinary motivation!

- **CREDO: a unifying, global** cosmic-ray project: **GeV – ZeV+**
  → completing the **closest accessible apporach to GUT scale**
- Strong science motivation: **ASTRO** / **GEO** / **BIO** / **FISHING**
- Citizen science (OUTREACH 2.0 + REAL SCIENCE)
- **All particle detectors** are CREDO
  (biggest + „high schools" + desktop + smartphone clouds)

CREDO

THE QUEST FOR UNEXPECTED

Scientific diversity: ASTRO/COSMO



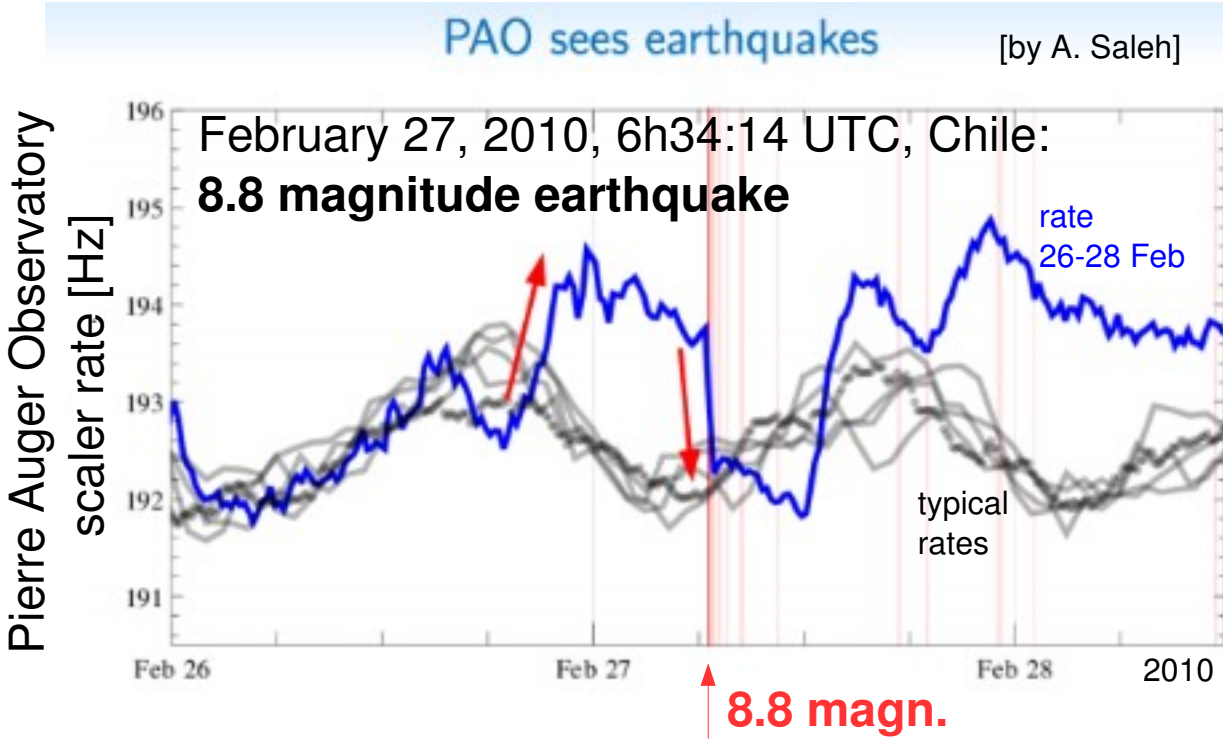
→ **millions of photons at E>TeV**, arriving simultaneously at the top of the atmosphere, **spread worldwide**!

Let us **hunt for coincidences**!

CREDO

THE QUEST FOR UNEXPECTED

Scientific diversity: GEO



- Increase of CR before the earthquake
- Strong drop during the earthquake

Tectonic plates move

↓

Inverse magnetostrictive effect

↓

Local geomagnetic field vector changes

↓

Variation of the CR rate

↓

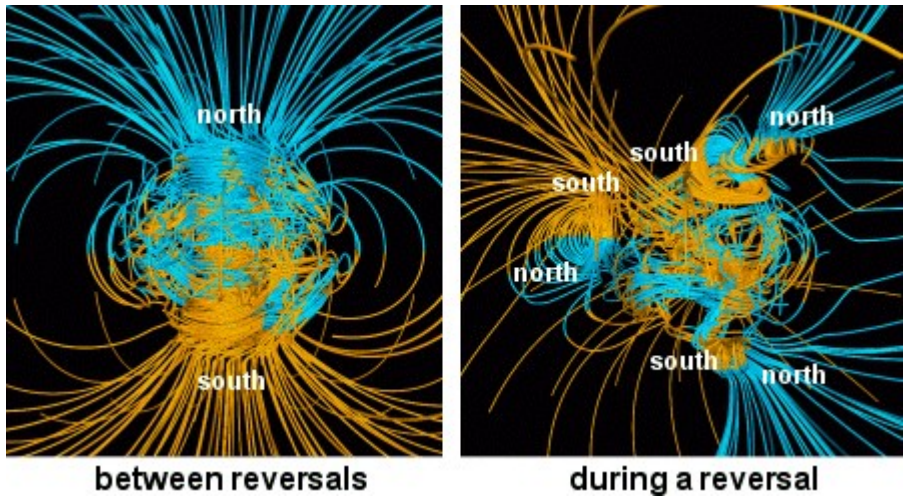
Earthquake precursors?

→ **CREDO-earthquakes task** [already existing]

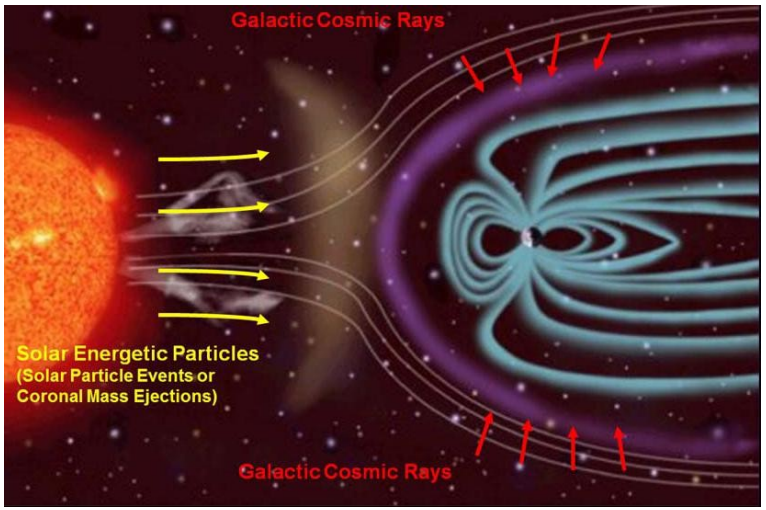
CREDO
THE QUEST FOR UNEXPECTED

Scientific diversity: GEO

Wikipedia: „Geomagnetic reversal”



Wikipedia: „Health threat from cosmic rays”



Earth outer core: Liquid (molten iron)
→ geomagnetism
↓
Impulse (tidal forces)
→ hydrodynamics: waves
↓
→ Mechanical wave upwards (slow, hours?)
→ Electromagnetic wave („instant”, ms)
↓
Local geomagnetic field vector changes
AND seismic effect might occur!
↓
Variation of the CR rate!
↓
Earthquake precursors?

CREDO

THE QUEST FOR UNEXPECTED

Scientific diversity: BIO

[Livescience.com, October 11, 2016]

On a Long Trip to Mars, Cosmic Radiation May Damage Astronauts' Brains

… and how can cosmic rays affect us on Earth?

Imagine a global network of cosmic ray detectors and global data on EEG...

CREDO

THE QUEST FOR UNEXPECTED

Scientific diversity: FISHING

Just cast the (global) cosmic-ray net and see which **truth** gets in...

Citizen Science: Science must be real

Citizen science

From Wikipedia, the free encyclopedia

Citizen science (**CS**) (also known as **crowd science**, **crowd-sourced science**, **civic science**, **volunteer monitoring** or **networked science**) is scientific research conducted, in whole or in part, by amateur or nonprofessional scientists. Citizen science is sometimes described as "public participation in scientific research", participatory monitoring and participatory action research.[1]

CITIZEN SCIENCE **IS NOT** OUTREACH!

PUBLICATIONS!

CO-AUTHORS!

New affiliation type: “amateur”

Mon. Not. R. Astron. Soc. **000**, 000–000 (0000) Printed 26 January 2016 (MN LATEX style file v2.2)

Planet Hunters X.
KIC 8462852 – Where’s the flux? ⋆†

T. S. Boyajian[1], D. M. LaCourse[2], S. A. Rappaport[3], D. Fabrycky[4], D. A. Fischer[1], D. Gandolfi[5,6], G. M. Kennedy[7], H. Korhonen[8,9], M. C. Liu[10], A. Moor[11], K. Olah[11], K. Vida[11], M. C. Wyatt[7], W. M. J. Best[10], J. Brewer[1], F. Ciesla[12], B. Csák[13], H. J. Deeg[14,15], T. J. Dupuy[16], G. Handler[17], K. Heng[18], S. B. Howell[19], S. T. Ishikawa[20], J. Kovács[13], T. Kozakis[21], L. Kriskovics[11], J. Lehtinen[22], C. Lintott[23], S. Lynn[24], D. Nespral[14,15], S. Nikbakhsh[22,25], K. Schawinski[26], J. R. Schmitt[1], A. M. Smith[27], Gy. Szabo[11,13,28], R. Szabo[11], J. Viuho[22], J. Wang[1,29], A. Weiksnar[20], M. Bosch[2], J. L. Connors[2], S. Goodman[2], G. Green[2], A. J. Hoekstra[2], T. Jebson[2], K. J. Jek[2], M. R. Omohundro[2], H. M. Schwengeler[2], A. Szewczyk[2]

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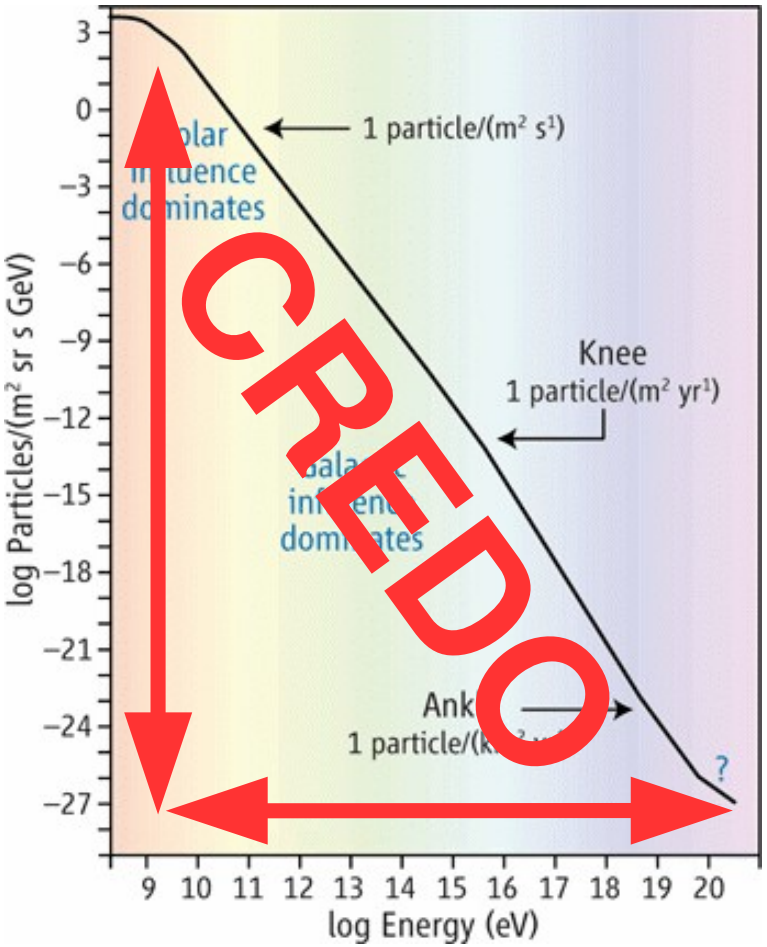
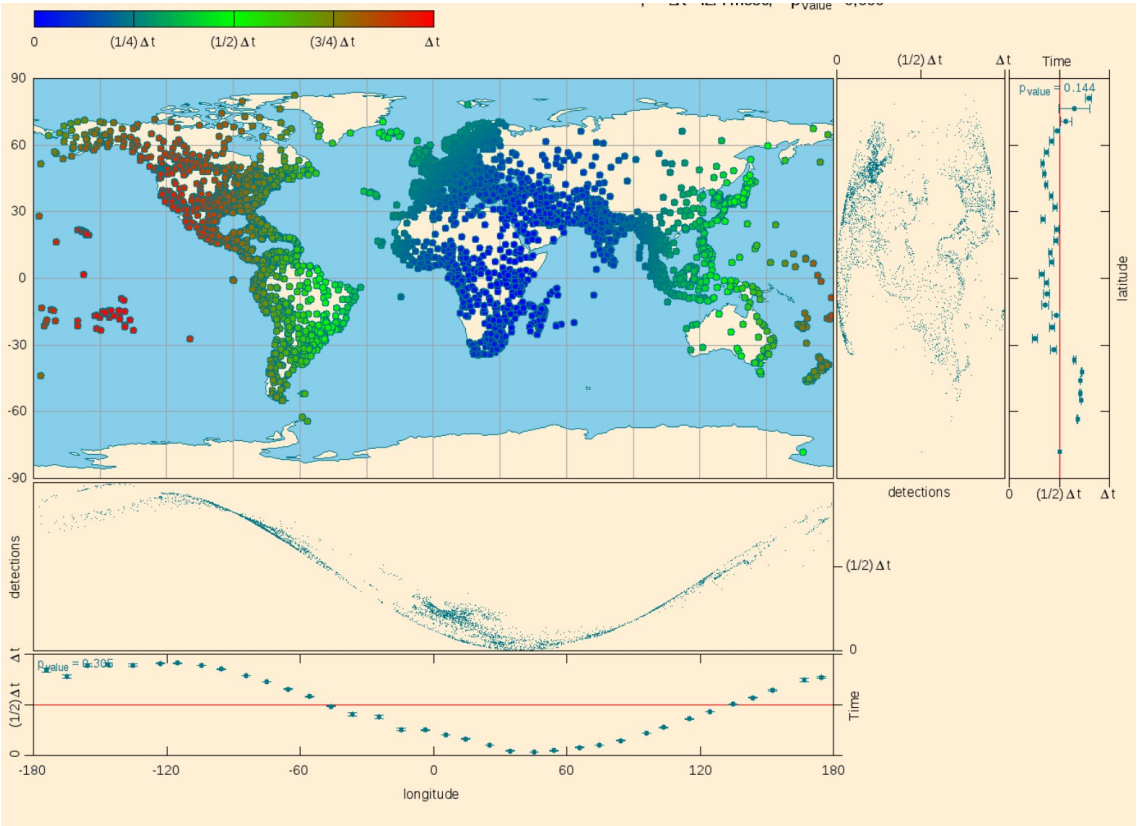
Vision: the potential of the complete CR study

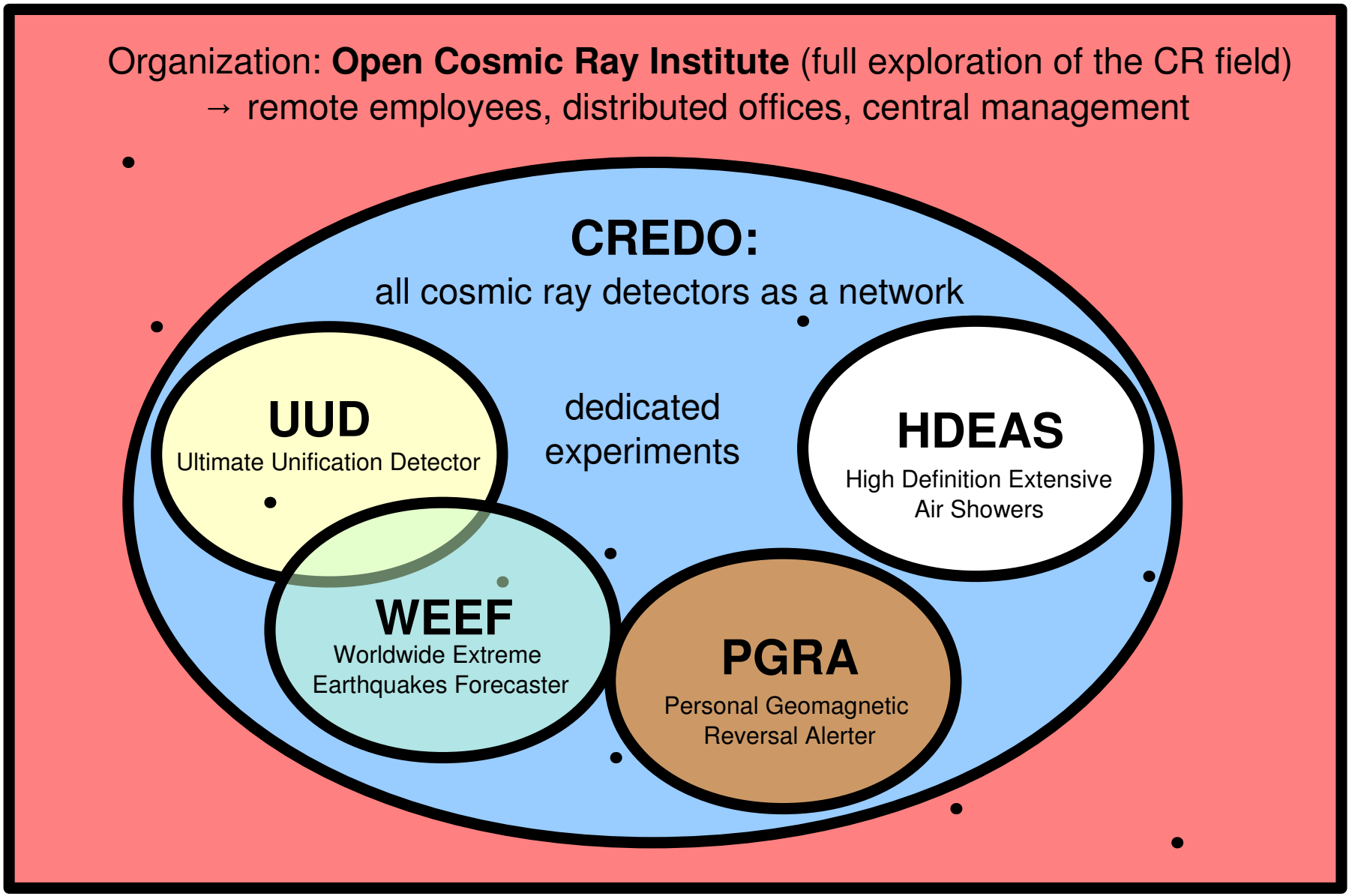




Would be a pity not to spot such a beauty...

Vision: organization of the complete CR study

Credit: P. Poznański

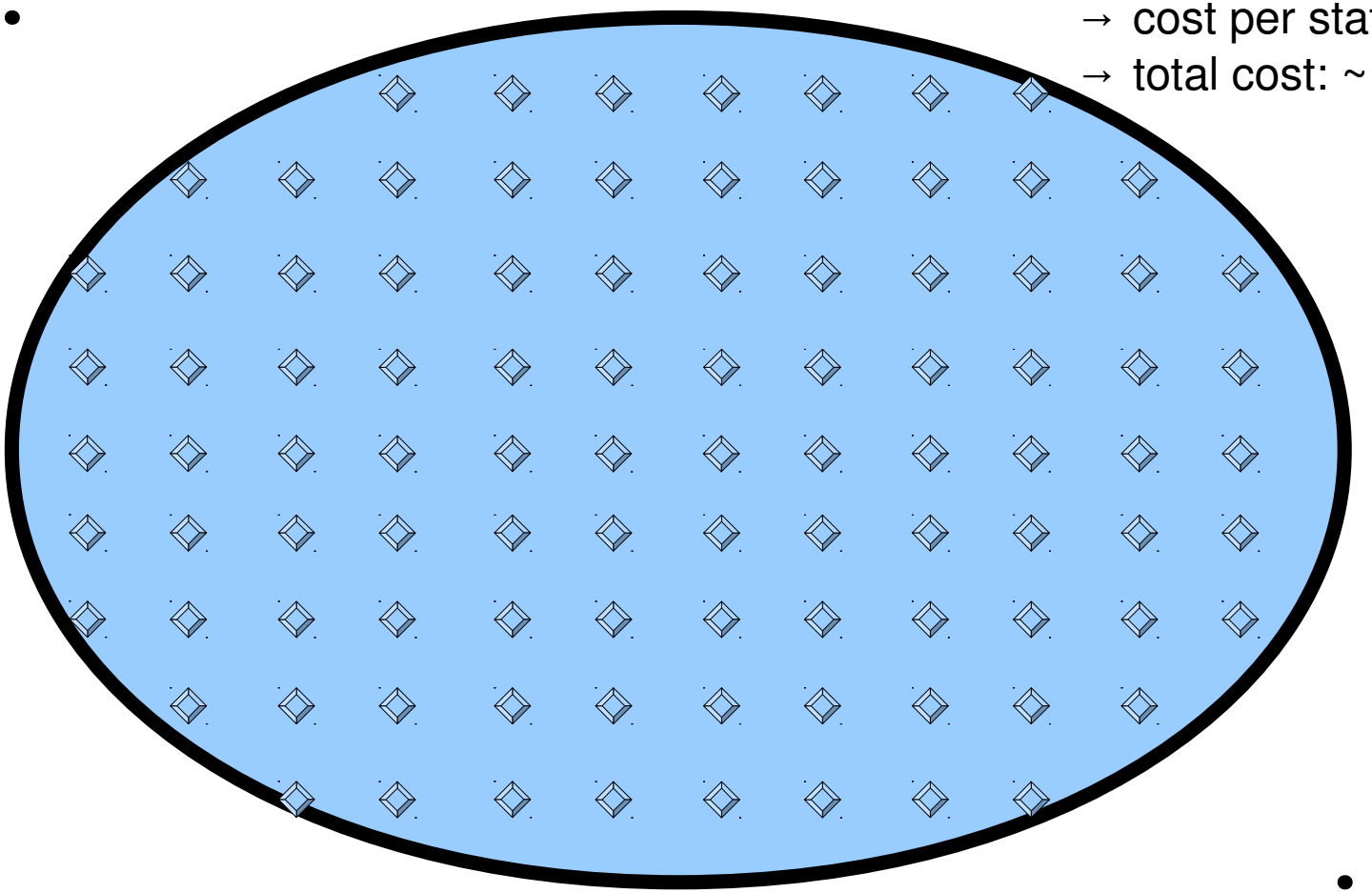


Vision: CREDO experiments

UUD
Ultimate Unification Detector

Ultimate Unification Detector

→ target: E>10^{20}eV
→ spacing: 10 km
→ stations: ~5,000,000
→ cost per station: < 1000 $
→ total cost: ~ 5 billion $

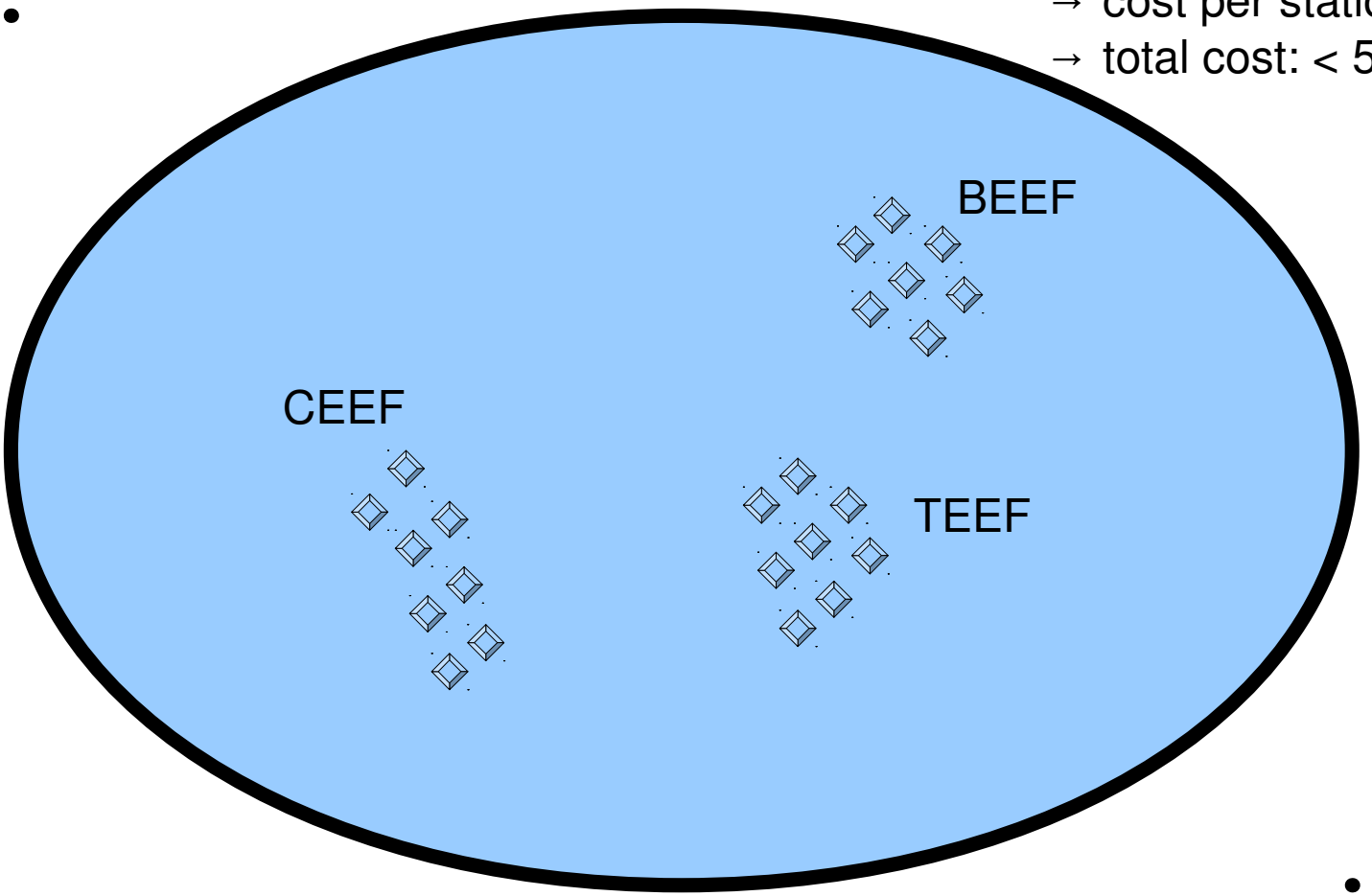


Vision: CREDO experiments

WEEF
Worldwide Extreme Earthquakes Forecaster

Worldwide Extreme Earthquake Forecaster

→ target: CR background
→ spacing: ~1 km / clusters
→ stations: ?
→ cost per station: < 2000 $
→ total cost: < 500 M$



Vision: CREDO experiments

PGRA
Personal Geomagnetic Reversal Alerter

Personal Geomagnetic Reversal Alerter

→ target: CR background
→ spacing: any
→ stations: ?
→ cost per station: < 100 $
→ total cost: private/individual

...

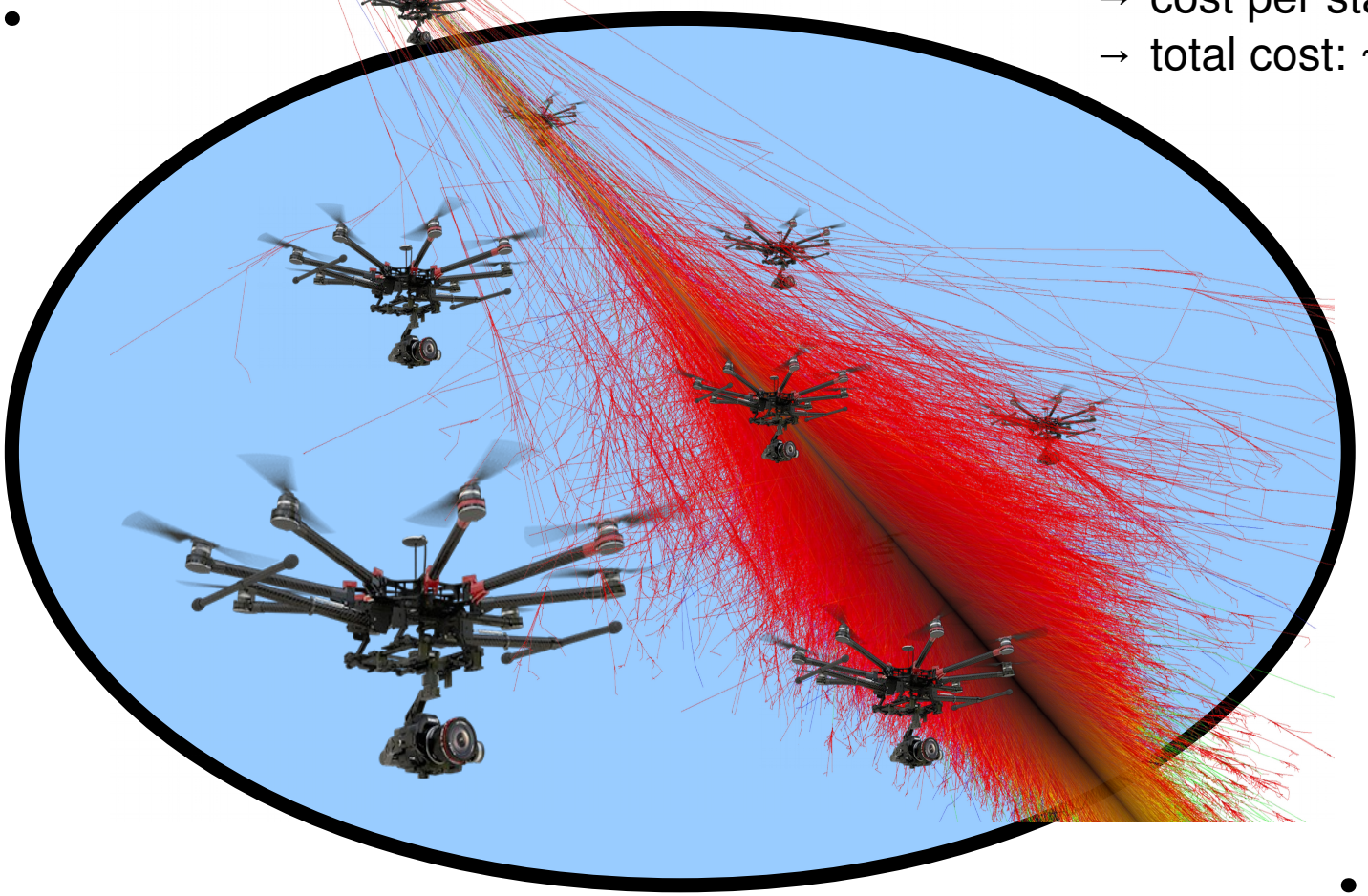
Vision: CREDO experiments

HDEAS

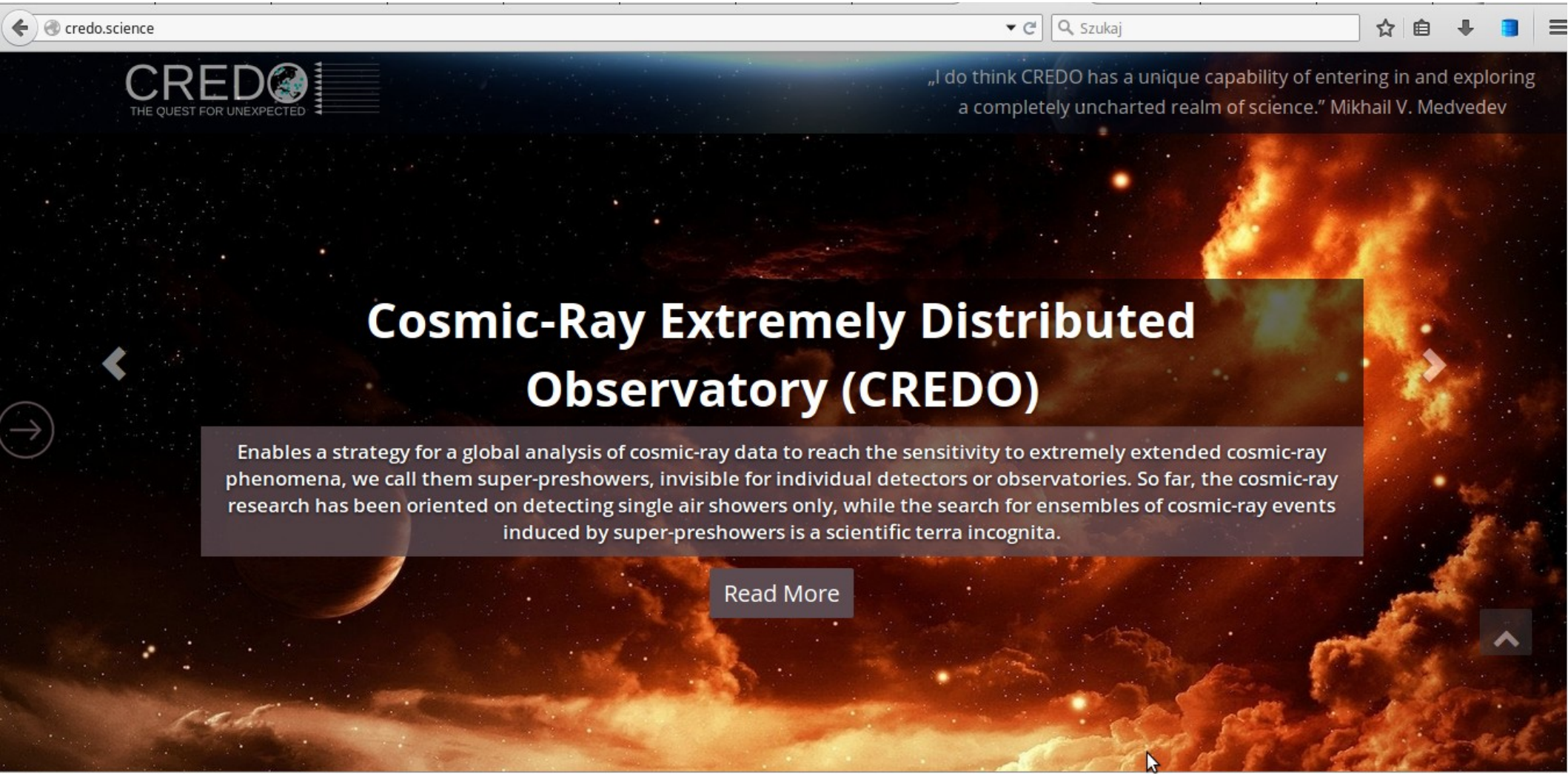
High Definition Extensive Air Showers

High Definition Extensive Air Showers

- → target: E>10^{15} eV
- → spacing: >1m (3D)
- → stations: ?
- → cost per station: ?
- → total cost: ~ 50 M $

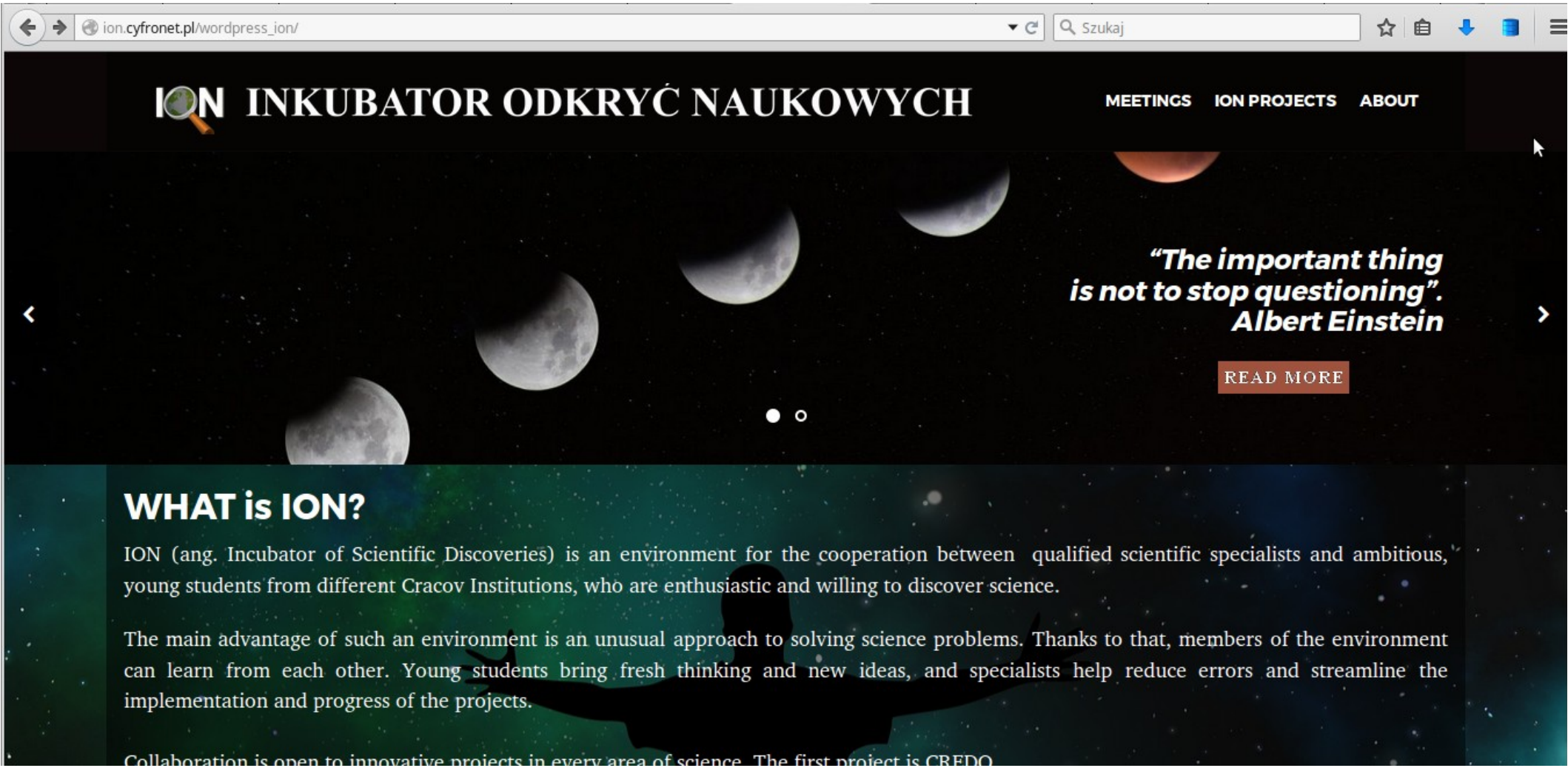


Visit credo.science...



… and contribute to CREDO science.

Incubator of Scientific Discoveries



Begin your journey to the Nobel Prize early...