



UNIVERSITY OF DELAWARE
**BARTOL RESEARCH
INSTITUTE**

Snowmass CF7: UHECR Mini Workshop

Whitepaper Section 6: UHECR Experiments

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Preliminary Outline of Whitepaper

Preliminary Outline

Executive Summary (1 page)

1. The Big Questions
2. The UHECR Paradigm Shift [Alan Coleman / Eric Mayotte]
3. Physics at the Energy Frontier – the synergy between UHECRs and Particle Physics [Dennis Soldin]
4. Pinpointing the Most Extreme Physical Processes in the Universe [Tonia Venters]
5. Stepping Up to the New Challenges [Johannes Eser / Eric Mayotte]
6. **The Next Generation Experiments [Fred Sarazin / Frank Schroeder]**

Experiment Representatives

Experiment representatives: Whom to contact

- Auger Armando Di Matteo (armando.dimatteo@to.infn.it)
- GCOS Jörg Hörandel (j.horandel@astro.ru.nl)
- GRAND Peter Denton (peterbd1@gmail.com)
- IceCube(-Gen 2) John Kelley (jkelley@icecube.wisc.edu)
- POEMMA John Krizmanic (john.f.krizmanic@nasa.gov)
- Telescope Array John Matthews (jnm@cosmic.utah.edu)

+ All the tasks listed before!

Goals of Section

- What is the **path to new discoveries** as informed by all the previous sections?
- Can we **quantify / optimize the experimental requirements** based on the science case?
 - Exposure, threshold (if applicable, for different primary particles)
 - Sky coverage (and exposure per sky coverage)
 - Accuracy for energy and mass (per event and average composition)
 - Coincident measurement of certain shower components, e.g., for hadronic interactions
- The next generation experiments / observatories (GCOS, GRAND, IceCube-Gen 2, POEMMA...) together with the existing ones (Auger, TA, IceCube...)
 - How will they **individually / collectively contribute** to the science case?
 - Where are the **synergies**? What is **uniquely** provided by a certain experiment?
 - Are there **any topics left unaddressed**?

Structure of Section

Few pages of common introduction with comparative/general plots

- experimental requirements for certain science questions (if not in previous section)
- combined plots, showing several experiments together where appropriate, e.g., regarding sky coverage, exposure, and energy range

2-3 pages per experiment

- ~ 1 page, very brief description of experimental design and timeline
- ~ 1-2 pages, scientific contribution of experiment
 - what is unique, synergetic, complementary to other experiments presented in the section?

→ **Contact your experimental representative for your personal contribution.**

Remember: Section needs to be updated after Dec 15, i.e., after science sections are in.