

Zheng, Xiong

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Education

- 2021 – now **Ph.D. student, Institute of High Energy Physics, Nuclear & Particle Physics**
LHAASO Experiment(Large High Altitude Air Shower Observatory)
Advisor: Prof. Huihai He, co-advisor: Assoc. Prof. Sha Wu
Main Work: Cosmic-ray electron measurement.
Measurement of cosmic-ray electron spectrum above 20 TeV with ground-based arrays is still challenging because of the difficulty of rejection of hadronic extensive air shower background. **In the feasibility research stage (2022)**, the simulation pointed out that the current hadron rejection power of the LHAASO-KM2A was insufficient. I developed a new method to use LHAASO-WCDA to measure the muonic content in each shower to improve the rejection power of LHAASO over 20 TeV **In the current research stage (2023)**, I am increasing the simulated statistics to get optimized discrimination cuts for LHAASO. These results have already been reported at a recent conference, ICRC 2023. And I expect to see the early result of the cosmic-ray electron spectrum measured by LHAASO in 2024.
- 2019 – 2021 **M.Sc. Institute of High Energy Physics, Nuclear & Particle Physics**
Cosmic Ray Physics | GPA: 3.83/5.0 (M1 & D1)
Main Work: Set Lorentz violation constraint based on the 1/2 LHAASO-KM2A data.
Advisor: Prof. Huihai He
- 2015 – 2019 **B.Eng, Wuhan University of Technology, Material Science and Engineering**
Material Physics and Computational Physics | GPA: 3.9/5.0
Thesis title: *The first principle calculation on the optical property on Barium-based complex perovskite (Ba(B'B'')O₃) ceramic.*([Archived link](#))
Advisor: Prof.Wen Chen, co-advisor: Prof. Jie Shen


Research Publications

Journal Articles

- 1 Xiong, Zheng*, S. Wu, and H. H. He, "Method to measure muon content of extensive air showers with LHAASO KM2A-WCDA synergy," (*article submitted for*) *Nuclear Instruments and Methods in Physics Research Section A*, 2023.
- 2 L. Chen, Xiong, Zheng*, C. Li, S. Chen, and H. He, "Strong constraints on Lorentz violation using new γ -ray observations around PeV," *Chinese Physics C*, vol. 45, no. 10, p. 105 105, 2021. [URL: https://iopscience.iop.org/article/10.1088/1674-1137/ac1166/meta](https://iopscience.iop.org/article/10.1088/1674-1137/ac1166/meta).





Conference Proceedings

- 1 H. H. He, Xiong, Zheng, and S. Wu, "Method to measure muon content of extensive air showers with LHAASO KM2A-WCDA synergy," *PoS(ICRC2023)314*, vol. PCRI1-13, Nagoya, Japan, 2023. [URL: https://pos.sissa.it/444/314/pdf](https://pos.sissa.it/444/314/pdf).




- 2 Xiong, Zheng*, S. Wu, and H. H. He, "Measurement of cosmic-ray electrons with LHAASO KM2A-WCDA synergy," PoS(ICRC2023)315, vol. CRI7-03, Nagoya, Japan, 2023.  URL: <https://pos.sissa.it/444/315/pdf>.

Popular Science Writing / Translation



Articles and Blogs

- 1 Z. Xiong and X. Q. Dong, "在校园捕捉来自宇宙的信息——2021年“国际宇宙日”活动概览(to capture the information from universe at campus - digest on 2021 cosmic day)," *Modern Physics*, vol. 34, no. 02, pp. 47–53, 2022, ISSN: 1001-0610.  DOI: 10.13405/j.cnki.xdwz.2022.02.017.
- 2 ParadoX, "超越费米悖论(Beyond Fermi Paradox)," in ser. Beyond Fermi Paradox 8/16, Mar. 2021.  URL: <https://mp.weixin.qq.com/s/9EqbGyC7wJtVuMysE7N1sA>.
- 3 ParadoX, "天文学家如愿以偿得到了想要的的数据,却发现“哈勃常数危机”加剧了(Astronomers Get Their Wish, and a Cosmic Crisis Gets Worse)," in ser. IHEP Doctorial Scope 1/3, Dec. 2020.  URL: https://mp.weixin.qq.com/s/hPDKQVW60trVTOAw8Mrp_A.
- 4 ParadoX, "天文学家的备忘手册(Astronomer's Toolbox)," in ser. Astronomer's Toolbox, 2020.  URL: <https://mp.weixin.qq.com/s/10kYWIxJZn-FotJNb-BAA>.





Internship

- 2020.04 – 2021.11  **Institute of High Energy Physics Official Account - Intern Assistant Editor.**
Pseudonym: ParadoX
Main Work:
- Routine Operation - Popular Science Press.
- Popular Science Writing - 20 posts in 3 column - 70000+ read.
- VLOG / Interview / Lecture video Editing - trim videos to match the average audience's attention span & subtitle editing.
- 2022.05 – now  **Campus Cosmic-ray Observation Collaboration (CCOC), IHEP - Intern Lecturer / Technician.**
Main Work: link
- Prepared and delivered Lectures in CCOC Summer School (2022, 2023).
- Installed Detector Array for Jiangyan High School.
- Museum volunteer for IHEP Open Day (2021,2022,2023) / China's National Science Popularization Day (2022).
- 2023.02 – now  **CubeVi Technology- Intern MLE.**
Main Work:
- Followed the latest research article revolving around the Neural Radiance Field (NeRF) for 3D reconstruction
- Trained the self-built dataset in comic convention, reduced computation cost under quality-loss tolerance, and separated the foreground/background scenes.
- Combination of the NeRF-cut model and Blender for CG scene creation.

LHAASO Collaboration Service



- 2020.09 – 2020.09  **Intern Technician.** Maintenance and verification of the KM2A-ED detectors, Shandong University.
- 2020.10 – 2020.11
- 2021.04 – 2022.05  **Intern Technician.** Installation and verification of the KM2A-MD detectors after 1/2 KM2A stage on-site service at the Large High Altitude Air Shower Observatory (LHAASO), Institute of High Energy Physics, CAS.

Skills



- Languages  Strong reading, writing, and speaking competencies in English, and Mandarin Chinese. Fluent in Japanese speaking and reading.
- Coding  C, C++, Python, cuda, \LaTeX , ...
- Software  CERN ROOT, CORSIKA, GEANT₄, CASTEP
- Misc.  Academic research, teaching, training, consultation, \LaTeX typesetting and publishing.

Miscellaneous Experience

Awards and Achievements

- 2016 - 2019  **WHUT Prize for Outstanding Student Performance**, Wuhan University of Technology.
- 2021 - 2022  **Department Prize for Outstanding Student Performance**, Institute of High Energy Physics.

Certifications

- 2018  **Certified Advanced Students Training.** Awarded by XLAB Göttinger Experimentallabor in Georg-August-Universität Göttingen.
- 2022  **Certified Data Analysis Skill.** Awarded by LHAASO Collaboration 2022 Summer School.

References

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