Dr. 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.
In the feasibility research stage (2022), I identified insufficient hadron rejection power in LHAASO-KM2A through simulations. Developed a novel method using LHAASO-WCDA to measure muonic content, enhancing rejection power of LHAASO-KM2A over 20 TeV. In the current stage (2023), optimizing discrimination cuts for LHAASO. Presented results at ICRC 2023; expecting early cosmic-ray electron spectrum results by 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 1/2 LHAASO-KM2A observation data on Ultra-High-Energy Photons.
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* $(Ba(B'B'')O_3)$ *ceramic.***(Archived link)**
Advisor: Prof. Wen Chen | Co-advisor: Prof. Jie Shen

Research Publications

Journal Articles

1. **Xiong, Zheng***, S. Wu, and L. C. He Hui Hai, "Method to measure muon content of extensive air showers with LHAASO KM2A-WCDA synergy," *Nuclear Instruments and Methods in Physics Research Section A*, vol. 1059, p. 168 958, 2024, ISSN: 0168-9002. DOI: https://doi.org/10.1016/j.nima.2023.168958.

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, 2021. DOI: https://doi.org/10.1088/1674-1137/ac1166.

Conference Proceedings

1. **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.

2. **Xiong, Zheng***, S. Wu, and H. H. He, "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.

Popular Science Writing / Translation

Articles and Blogs

1. **Xiong, Zheng*** 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. **Xiong, Zheng*** and J. Liu, "空气电离之谜(mystery of the spontaneous discharge of an electrometer)," *Modern Physics*, vol. 34, no. 03, pp. 54–58, 2022, ISSN: 1001-0610. DOI: 10.13405/j.cnki.xdwz.2022.03.007.
3. 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.
4. ParadoX, "天文学家如愿以偿得到了想要的数据,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.
5. 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/l0kYWIsxJZn-FotJNb-BAA.

Campus Service

2020.04 – 2021.11 **Institute of High Energy Physics Official Account - Intern Assistant Editor (Pseudonym: ParadoX)**
Key Contributions:
- Managed routine operations for the Popular Science Press.
- Authored 20 popular science articles, garnering 80,000+ reads across three columns.
- Edited VLOGs, interviews, and lecture videos, optimizing length for audience engagement and refining subtitles.

2022.05 – now **Campus Cosmic-ray Observation Collaboration (CCOC), IHEP - Intern Lecturer / Technician**
Key Contributions: (link)
- Led lectures at CCOC Summer School (2022, 2023) enhancing students' understanding of cosmic-ray observation.
- Installed Detector Array at Jiangyan High School, contributing to the expansion of cosmic-ray observation into high school.
- Volunteered during IHEP Open Day (2021-2023) and China's National Science Popularization Day (2022), fostering public awareness and interest in cosmic-ray research.

LHAASO Collaboration Service

2020.09 – 2020.09 **Intern Technician.** Shandong University - Maintenance and verification of KM2A-ED 20 detectors.

2020.10 – 2020.11

2021.04 – 2022.05 **Intern Technician.** LHAASO Collaboration - Installed and verified over 200 KM2A-MD detectors during the 1/2 KM2A stage on-site service at the Large High Altitude Air Shower Observatory (LHAASO), located at 4410 m on Haizi Mt.

Internship

2023.03 – 2024.03 **CubeVi Technology- Intern MLE.**
Main Work:
- Stayed updated on NeRF advancements, incorporating improvements into 3D scene reconstruction strategies.
- Efficiently trained a custom dataset from comic conventions, optimizing the balance between computational cost and quality.
- Applied NeRF-cut model and Blender to create high-quality computer-generated (CG) scenes.

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, …

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. Top 30% of grades.

2021 - 2022 **Department Prize for Outstanding Student Performance**, Institute of High Energy Physics. Top 30% of grades.

2023 **Commendation Award for Completing Pre-dissertation degree requirements**, Institute of High Energy Physics. Top 30% of Ph.D. candidates.

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

Prof. Huihai He
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