

# Kaiyuan Shi

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## EDUCATION

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**B.S. in Physics**, University of California, Los Angeles Sep 2020 – Mar 2022  
Major GPA: 3.96/4.00, Cumulative GPA: 3.87/4.00

**B.S. in Physics**, University of California, Santa Barbara Sep 2018 – Jun 2020  
*Transferred to UCLA*

## RESEARCH EXPERIENCE

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**PandaX** Shanghai, China  
*Research Assistant (Supervisor: Prof. Jianglai Liu and Dr. Xun Chen)* Sep 2020 – Feb 2022

- Assess the performance of the next generation 30-ton level PandaX experiment related to neutrinoless double beta decay. In particular, distinguish double beta decay events from gamma backgrounds in dual-phase xenon time projection chambers based on optics simulation generated by Geant4.
- Visualize the accumulation and study the properties of Cerenkov photons for single recoiling electron and double beta decay. A time-of-flight cut is used to separate Cerenkov photons from scintillation light.
- Achieve 95% differentiation accuracy with back-to-back double beta decay events and 74% accuracy with double beta decay events considering angular electron correlation, when sources are placed at the center of TPC, using deep learning with Python and OpenCV.
- Tested the performance of photomultipliers under low temperature.

**QCD Theory Group** Los Angeles, US  
*Undergraduate Research Assistant (Supervisor: Prof. Zhongbo Kang)* Oct 2021 – Present

- Study the high energy observables within the Color Glass Condensate effective field theory. In particular, study the cross section of proton-nucleus scattering and deep inelastic scattering in the saturated regime.
- Explain the peak width and suppression of neutral pion pair production from proton-nucleus collision in the recent STAR collaboration data. Consider both the rcBK evolution of transverse-momentum-dependent gluon distributions and the Sudakov effect.
- Predict the behavior of Electron-Ion Collider related to di-hadron production.

**Arisaka Lab at UCLA** Los Angeles, US  
*Undergraduate Research Assistant (Supervisor: Prof. Katsushi Arisaka)* Dec 2020 – June 2021

- Conducted PsychoPy experiments using face images and written characters, analyzed data with MATLAB in the scaling group of biophysics. Found the increase in visual recognition time is proportional to the scaling factor of the object in log scale.
- Presented the results during the undergraduate research week of UCLA in May 2021.
- Paper is currently under peer review, <https://doi.org/10.1101/2022.03.01.482004>.

## SKILLS

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### Programming Languages

Familiar with: C++, Python, ROOT, Latex, UNIX command line  
Have experience with: MATLAB, Java, Mathematica

### Human Languages

Fluent: English and Mandarin.