

# Jeonghwa Kim

PH.D. STUDENT · DEPARTMENT OF PHYSICS

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“Be humble for you are made of earth. Be noble for you are made of stars.”

## Education

### UC Santa Barbara

PH.D. IN PHYSICS

[California, U.S.](#)

*Sep. 2022 - present*

### Korea University

B.S. IN PHYSICS

[Seoul, S.Korea](#)

*Mar. 2018 - Feb. 2022*

### Seoul Science High School

HIGH SCHOOL DIPLOMA

[Seoul, S.Korea](#)

*Mar. 2015 - Feb. 2018*

## Research Experience

### The LUX-ZEPLIN Dark Matter Experiment (Advisor: Hugh Lippincott)

RESEARCH ASSISTANT

[California, U.S.](#)

*Jul. 2022 - present*

- Working on energy readout calibration of xenon skin surrounding the main TPC.

### Improved background estimation with neural nets (Advisor: Suyong Choi)

RESEARCH ASSISTANT

[Seoul, S.Korea](#)

*Apr. 2021 - Feb. 2022*

- Incorporated neural network to the ABCD method of background estimation. Achieved enhanced background estimates for  $pp \rightarrow tt+jets$  final state. The method works with correlated classifiers in arbitrary dimensions.

### Long-lived particle search in CMS (Advisor: Jaehyeok Yoo)

RESEARCH ASSISTANT

[Seoul, S.Korea](#)

*Aug. 2020 - Feb. 2022*

- Participated in the trigger development targeting long-lived particles in CMS HCAL.
- Calculated the sensitivity gain from HCAL timing information in addition to the ECAL timing. Expanded on the idea of using ratios of energy deposits between the HCAL and ECAL as a trigger. Wrote a python script that can simulate L1 trigger performance given the trigger design.
- Generated splitSUSY samples through CMSSW. Tested the performance of timing triggers.

### SUBMET: Search for sub-millicharged particles at J-PARC (Advisor: Jaehyeok Yoo)

RESEARCH ASSISTANT

[Seoul, S.Korea](#)

*Aug. 2019 - Apr. 2021*

- Studied the feasibility of detecting millicharged particles at J-PARC with a multi-layer scintillator detector. Currently has best sensitivity for sub-GeV mass range among all proposed experiments.
- Ran all necessary collider and detector simulations with Pythia8 and Geant4. Presented the result at multiple meetings and workshops.
- Submitted a letter of intent to J-PARC with a follow-up first author publication. Currently under approval process and early R&D. Funded by the National Research Foundation of Korea.

## Publication

### INTERNATIONAL JOURNALS

#### Search for long-lived particles using the calorimeter timing at the LHC

Jeong Hwa Kim, Jayashri Padmanaban, Jaehyeok Yoo

[J. Korean Phys. Soc.](#)

2022

<https://doi.org/10.1007/s40042-022-00433-x>

[link](#)

#### Search for sub-millicharged particles at J-PARC

Jeong Hwa Kim, In Sung Hwang, Jaehyeok Yoo

[J. High Energy Phys.](#)

2021

[https://doi.org/10.1007/JHEP05\(2021\)031](https://doi.org/10.1007/JHEP05(2021)031)

[link](#)

### OTHERS

#### Letter of Intent: Search for sub-millicharged particles at J-PARC

Suyong Choi, Jeong Hwa Kim, Eunil Won, Jae Hyeok Yoo, Matthew Citron, David Stuart, Christopher S. Hill,

[arXiv preprint](#)

Andy Haas, Jihad Sahili, Haitham Zaraket, A. De Roeck, Martin Gastal

2020

e-Print: 2007.06329

[link](#)

## Honors & Awards

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2020 **Outstanding Presentation Award**, 2020 KPS Fall Meeting

2019 **Jinri Scholarship**, Research-based scholarship

*The Korean  
Physical Society  
Korea University*

## Teaching Experience

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2022 **PHYS 134L (Observational Astrophysics)**, Teaching Assistant

*UC Santa Barbara*

## Presentation

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### 2021 KPS Fall Meeting

SPEAKER FOR <DATA-DRIVEN BACKGROUND RATE ESTIMATION WITH NEURAL NETWORKS>

*Seoul, S.Korea (online)*

*Oct. 2021*

### 2020 KPS Fall Meeting

SPEAKER FOR <SUBMET: SEARCH FOR SUB-MILLICHARGED PARTICLES AT J-PARC>

*Seoul, S.Korea (online)*

*Nov. 2020*

## Workshops & Lectures (selected)

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### Searching for long-lived particles at the LHC and beyond: Ninth workshop of the LLP Community

PARTICIPANT

*CERN (Online)*

*May. 2021*

### FIPs 2020 - Feebly interacting particles 2020

PARTICIPANT

*CERN (Online)*

*Aug. 2020*

### SLAC Summer Institute 2020

PARTICIPANT

*California, USA (Online)*

*Aug. 2020*

### QUC School on A.I. in High Energy Physics

PARTICIPANT

*Seoul, S.Korea (Online)*

*Jul. 2020*

### KAIST-KAIX Workshop for Future Particle Accelerators

PARTICIPANT

*Daejeon, S.Korea*

*Jul. 2019*

## Skills

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**Programming** Python, C++

**Libraries** ROOT, PYTHIA, Geant4, Uproot, Awkward, TensorFlow, Numpy, Scipy, Camb, Healpy, etc.

**Experienced in**  $\LaTeX$ , Linux environment

**Languages** Korean (native), English (fluent)