

# Ching Him Leung

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## Professional Position

May 2024 - **Hall C Postdoctoral Fellow, Jefferson Lab**

- present
- Lead the commissioning of the GEM tracking detector for the SBS GEp experiment in Hall A.
  - Participate in the LAD experiment in Hall C, and the commissioning of the GEM detector.
  - Study the potential of the proposed SoLID experiment on the polarized sea quark distributions.

## Education

Aug 2018 - **Ph.D. in Physics, University of Illinois Urbana-Champaign**

May 2024 Advisor: Prof. Jen-Chieh Peng

Thesis title: Probing Parton Distributions in Proton using Drell-Yan and Charmonium Production with 120 GeV Proton Beam at Fermilab

July 2014 - **Bachelor of Science, Physics, The Chinese University of Hong Kong**

June 2018

## Other Research Experience

June 2019 - **Research Assistant, University of Illinois, Urbana-Champaign**

May 2024 **FNAL-E906/SeaQuest**

The aim of the experiment is to measure the light sea-quark asymmetry in proton using the Drell-Yan process.

- Analyze the charmonium production data to extract the  $p+d$  and  $p+p$  differential cross section and the  $(p+d)/2(p+p)$  charmonium cross section ratio as an independent method to probe the  $\bar{d}/\bar{u}$  asymmetry in the proton.
- Extract the  $(p+d)/2(p+p)$  Drell-Yan cross section ratio from the entire SeaQuest datasets to extract the  $\bar{d}/\bar{u}$  light sea-quark flavor asymmetry in proton for  $0.1 < x < 0.45$ .
- Develop an analysis procedure to ensure the statistical uncertainty from the simulation is properly included to extract the charmonium and Drell-Yan yield.
- Modify the Monte Carlo generator to ensure that proper kinematic constraints are applied.
- Prepare internal analysis notes and present progress reports in weekly meetings.

**FNAL-E1039/SpinQuest**

The follow-up experiment of SeaQuest, which aims to measure the Sivers asymmetry of the sea-quark using the Drell-Yan process with a polarized target.

- Migrating the data acquisition system from SL6 to SL7.
- Manage and maintain the SpinQuest DAQ and computing systems.

May -Aug 2016 **Summer Student, University of Illinois, Urbana-Champaign**

- 2016
- Analyze transverse momentum distribution from existing Drell-Yan production data under the supervision of Prof. Jen-Chieh Peng.
  - Perform fixed order QCD calculation for Drell-Yan process and compared with data.

## Teaching Experience

- Aug 2018 - **Teaching Assistant**, *University of Illinois, Urbana-Champaign*
- May 2019
- Modern Experimental Physics (Spring 2022)
  - Classical Mechanics II (Spring 2019)
  - Atomic Phys & Quantum Theory (Fall 2018)
- July - Aug 2015 **Junior Research Assistant**, *Faculty of Education, The Chinese University of Hong Kong*  
Assisted instructors in conducting enrichment course in the summer Program for the Gifted and Talented 2015.

## Honors and Awards

- 2022 **Felix T. Adler Award**, *University of Illinois, Urbana-Champaign*  
For outstanding work by physics graduate student in the area of nuclear physics.
- 2020 **Maurice Goldhaber Research Scholar Award in Nuclear Physics**, *University of Illinois, Urbana-Champaign*  
Awarded to outstanding graduate students who consistently demonstrates the highest level of performance in a nuclear physics research program.

## Publications

- C. H. Leung et al. (SeaQuest Collaboration), *Final SeaQuest results on the flavor asymmetry of the proton light-quark sea with proton-induced Drell-Yan process*, (Dec. 19, 2025) arXiv:2512.17564 [hep-ex], <http://arxiv.org/abs/2512.17564> (visited on 12/23/2025), pre-published
- C. H. Leung et al. (SeaQuest Collaboration), “Measurement of  $J/\psi$  and  $\psi(2S)$  production in  $p + p$  and  $p + d$  interactions at 120 GeV”, *Phys. Lett. B* **858**, 139032 (2024), arXiv:2406.11459 [hep-ex]
- J. Dove et al. (SeaQuest Collaboration), “Measurement of flavor asymmetry of light-quark sea in the proton with Drell-Yan dimuon production in  $p + p$  and  $p + d$  collisions at 120 GeV”, *Phys. Rev. C* **108**, 035202 (2023), arXiv:2212.12160 [hep-ph]
- C. H. Leung (SeaQuest Collaboration), “Measurement of Charmonium Production in  $p + p$  and  $p + d$  Interactions in the Fermilab SeaQuest Experiment”, in 29th International Workshop on Deep-Inelastic Scattering and Related Subjects (July 2022), arXiv:2207.05640 [hep-ex]
- J. Dove et al. (SeaQuest Collaboration), “The asymmetry of antimatter in the proton”, *Nature* **590**, 561 (2021), arXiv:2103.04024 [hep-ph]
- A. Chen et al. (SeaQuest Collaboration), “Probing nucleon’s spin structures with polarized Drell-Yan in the Fermilab SpinQuest experiment”, PoS **SPIN2018**, edited by P. Lenisa, G. Ciullo, M. Contalbrigo, and L. Pappalardo, 164 (2019), arXiv:1901.09994 [nucl-ex]
- W. Gong et al., “Stable Intrinsic Long Range Antiferromagnetic Coupling in Dilutely V Doped Chalcopyrite”, *Chinese Phys. Lett.* **37**, 027501 (2020)

## Conference Presentations

- Jan 2025 **Probing the proton structure with Drell-Yan process and charmonium production at the SeaQuest experiment**  
Invited talk at Cold Nuclear Matter Effects: from the LHC to the EIC Workshop.

- March 2023 **Drell-Yan and charmonium production in  $p+p$  and  $p+d$  interaction at 120 GeV from the SeaQuest experiment**  
Contributed talk at DIS2023: XXX International Workshop on Deep-Inelastic Scattering and Related Subjects.
- Oct 2022 **Drell-Yan and charmonium production in  $p+p$  and  $p+d$  interactions at 120 GeV from the SeaQuest experiment**  
Contributed talk at 2022 Fall Meeting of the APS Division of Nuclear Physics.
- May 2022 **Measurement of charmonium production in  $p+p$  and  $p+d$  interaction in the Fermilab SeaQuest experiment**  
Contributed talk at DIS2022: XXIX International Workshop on Deep-Inelastic Scattering and Related Subjects.
- Oct 2021 **Measurement of  $J/\psi$  and  $\psi'$  production in  $p+p$  and  $p+d$  interaction with 120 GeV proton beam in the Fermilab SeaQuest experiment**  
Contributed talk at 2021 Fall Meeting of the APS Division of Nuclear Physics.
- Oct 2020 **Measurement of  $p+d/p+p$   $J/\psi$  cross section ratio with 120 GeV proton beam in the SeaQuest experiment**  
Contributed talk at 2020 Fall Meeting of the APS Division of Nuclear Physics.

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## Technical Skills

Programming	C/C++, Python, SQL	Tools	Git, Apptainer/Singularity
HEP Library	ROOT	OS	Linux