

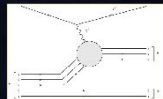
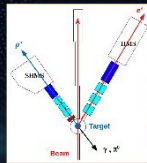
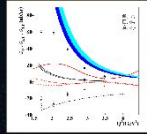
BACKWARD-ANGLE (U-CHANNEL) PHYSICS WORKSHOP

September 21 - 22, 2020 • Jefferson Lab

We are pleased to announce that the First Backward-Angle (u-channel) Physics Workshop will be held September 21-22 at Jefferson Lab, Newport News, VA.

TOPICS

- Offer a platform to connect scattered experiment and theory efforts together, thus, potentially forming small backward-angle physics working groups.
- Generate discussions on the implications the backward-angle physics and probe the physics case for a systematic backward-angle physics research program.
- Inspire future backward-angle physics data mining or dedicated studies, including the JLab 12 GeV program, and PANDA/FAIR.
- Discuss the feasibility of including backward-angle physics in the EIC scientific program.



Welcome to: *u*-Channel (Backward-angle) Physics workshop

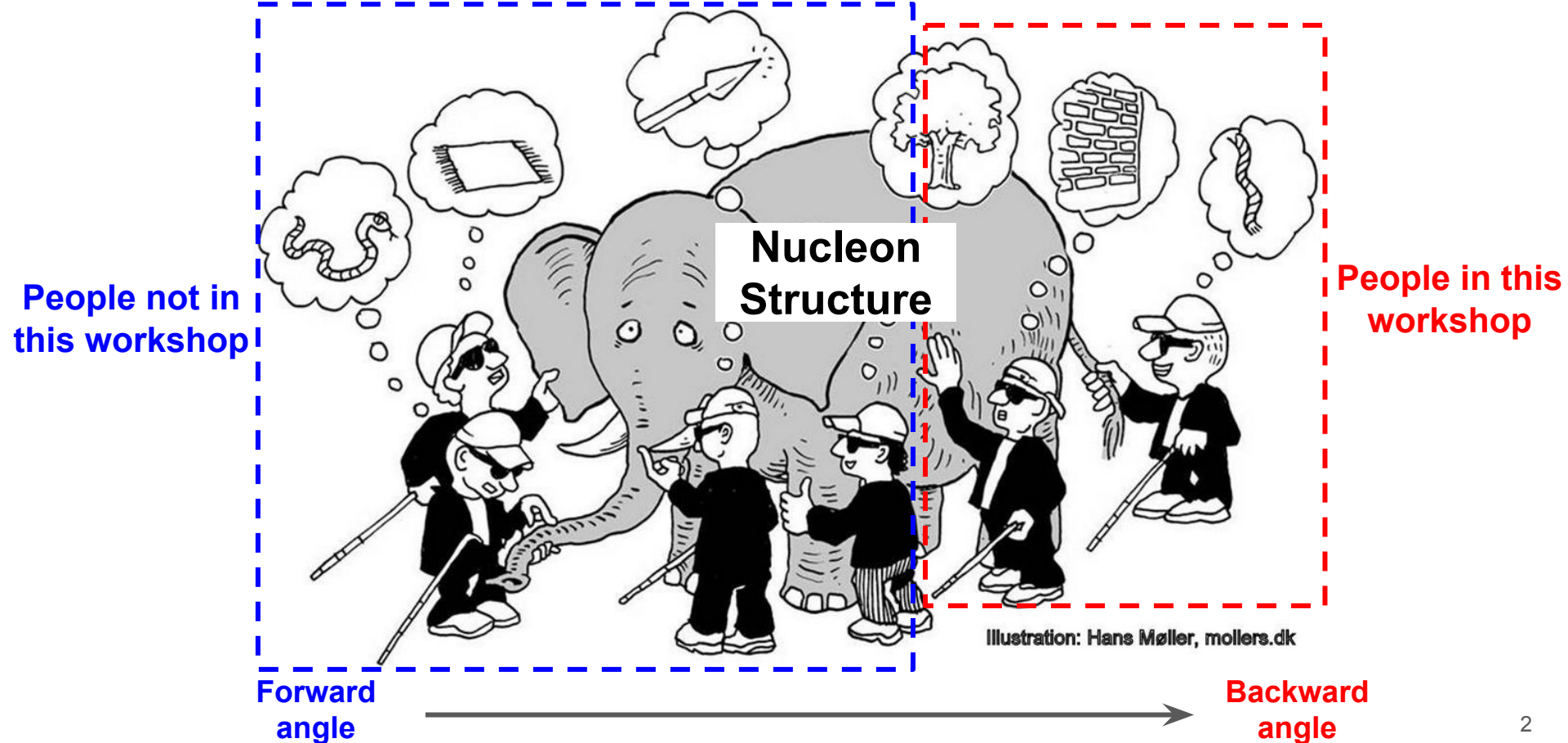
Organizing Committee: Garth Huber (University of Regina),
Wenliang (Bill) Li* (William & Mary),
Justin Stevens (William & Mary)

Executive Consultant: Christian Weiss (JLab)

21/Sep/2020

www.jlab.org/indico/event/375/

What kind people are we?



Objectives and Goal of the Workshop

Main objectives:

- Offer a platform to **connect scattered experiment and theory** efforts together, thus, potentially forming small backward-angle physics working groups.
- Generate discussions on the implications the backward-angle physics and probe the physics case for a **systematic backward-angle physics research program**.
- **Inspire future backward-angle physics** data mining or dedicated studies, including the JLab 12 GeV program, PANDA/FAIR and future EIC.

Our goal:

- **Summarize the workshop outcomes and discussions on the u-channel physics strategy in a white paper.**

Our wish as organizers:

- **Let's relax and have an enjoyable workshop.**

Scatters of experimental and theory efforts

The workshop have representatives from all four halls, from JLab 6, 12 GeV, PANDA and EIC

- **u-channel electroproduction examples at 12 GeV**
 - CLAS 12 single pion spin asymmetry (Hall **B**)
 - U-channel meson production (omega, rho, phi) production from Kaon LT experiment (Hall **C**)
- **u-channel photoproduction examples at 12 GeV**
 - Timelike Compton scattering (Hall **D**)
 - Wide angle compton scattering (Hall **C**)
 - ω Photoproduction off Proton Target at Backward Angles (Hall **D**)
 - K+Sigma0 Photoproduction at Backward Angle at GlueX Experiment (Hall **D**)
 - Baryon-antibaryon Photoproduction at Backward Angle at GlueX Experiment (Hall **D**)
- **Theory perspective:**
 - Meson-Nucleon Transition Distribution Amplitude
 - Photon-nucleon together with meson-nucleon TDAs
 - Skewed Parton Distribution
 - u -channel Regge Approach
- **Future perspective of u-channel physics**
 - u -channel mesons production at EIC
 - Studying TDA with $pp \rightarrow e+e^{-}+\pi^0$ at the PANDA Experiment
- **And more !**

Workshop format

- **Date & Time:**
 - September 21 - 23, 9:00 -13:30 EST.
 - My sincere apology to the participants in a different time zone (Europe, Asia, California, etc)
- **Day 1: Electro-production Production Session**
 - Session Convenor: **Wenliang (Bill) Li**
 - No discussion session
- **Day 2: Electro-production Production Session**
 - Session Convenor: **Justin Stevens**
 - Discussion session: **Christian Weiss**
- **Day 3: Photo-production Production Session**
 - Session Convenor: **Garth Huber**
 - Discussion session: **Christian Weiss**

Day 1 (Monday, 21 Sep): Electroproduction Session 1

09:00 - 09:15

Welcome and Introduction 15'

Speaker: Dr. Wenliang Li (William & Mary)

09:15 - 13:05

Morning Session 1: u-channel Electroproduction Processes

Test

Convener: Dr. Wenliang Li (William & Mary)

09:15 **Meson-Nucleon Transition Distribution Amplitude 30'**

Speaker: Dr. Kirill Semenov-Tian-Shansky (Petersburg Nuclear Physics Institute)

09:45 **Large Angle Beam-Spin-Asymmetry of pions at CLAS 20'**

Speaker: Dr. Stefan Diehl (Justus Liebig University Giessen and University of Connecticut)

10:05 **Backward Charged π^+ Electroproduction from CLAS 6 20'**

Speaker: Dr. Kijun Park (ODU)

10:25 **Coffee Break 20'**

10:45 **GPDs at large Skewness 30'**

Speaker: Prof. Mark Strikman (Penn State University)

11:15 **Exploring the soft-hard transition in backward electroproduction 30'**

Speaker: Christian Weiss (Jefferson Lab)

11:45 **Coffee Break 20'**

12:05 **Radiative Correction at Backward Angles 30'**

Speaker: Andrei Afanasev (GWU)

12:35 **Backward Exclusive ω Electroproduction from JLab 6 GeV Hall C 20'**

Speaker: Prof. Garth Huber (University of Regina)

Theory presentation

Day 2 (Tuesday, 22 Sep): Electroproduction Session 2

09:00 - 12:15

Morning Session 1: Future u-channel Opportunities 12 GeV, PANDA and EIC

Test

Convener: Justin Stevens (College of William and Mary)

09:00 **Studying TDA with $pp \rightarrow e+e-\pi 0$ at the PANDA Experiment 25'**

Speaker: Dr. Stefan Diehl (Justus Liebig University Giessen and University of Connecticut)

09:25 **Backward Meson Electroproduction Opportunities at EIC 25'**

Speaker: Dr. Wenliang Li (William & Mary)

09:50 **Backward Opportunities at JLab 12 GeV Hall A with BigBite and Super BigBite Spectrometers 20'**

Speaker: Dr. Carlos Ayerbe Gayoso (The College of William and Mary)

10:10 **Short Range Correlation and Backward Nucleon Tagging 20'**

Speaker: Florian Hauenstein (Old Dominion University)

10:30 **Coffee break 20'**

10:50 **Backward Meson Electroproduction from JLab 12 GeV Hall C Kaon LT Experiment 25'**

Speaker: Dr. Stephen Kay (University of Regina)

11:15 **Non-forward $\pi^+\pi^-$ Production 30'**

Speaker: Lukasz Bibrzycki (Pedagogical University of Cracow)

**Theory
presentation**

11:45 **Backward production at high energies, in ultra-peripheral collisions and at an EIC 25'**

Speaker: Dr. Spencer Klein (Lawrence Berkeley National Laboratory)

12:10 - 12:30

Coffee Break

12:30 - 13:30

Session Discussion on u-channel Electroproduction *1h0'*

Speaker: Christian Weiss (Jefferson Lab)

**Discussion
Session**

Day 3 (Wednesday, 23 Sep) : Photoproduction Session

09:00 - 11:50

u-channel Photoproduction Processes

Convener: Prof. Garth Huber (University of Regina)

09:00 **ω Photoproduction off Proton Target at Backward Angles 35'**

Speaker: Dr. Byung-Geel Yu (Korea Aerospace University)

09:35 **u-channel Photoproduction and Backward Angle TCS 25'**

Speaker: Dr. Bernard Pire (CPHT-Polytechnique)

**Theory
presentation**

10:00 **Wide Compton Scattering at Hall C 25'**

Speaker: Dr. Bogdan Wojtsekhowski (Jefferson Lab)

10:25 **Coffee Break 20'**

10:45 **Backward-angle meson photoproduction with the GlueX experiment 25'**

Speaker: Justin Stevens (College of William and Mary)

11:10 **Backward Baryon-Antibaryon Photoproduction at GlueX Experiment 20'**

Speaker: Mr. Hao Li (Carnegie Mellon University)

11:30 **K^+ Σ^0 Photoproduction at Backward Angle at GlueX Experiment 20'**

Speaker: Nilanga Wickramaarachch (Old Dominion University)

11:50 - 12:10

Coffee break

12:10 - 13:10

Session discussion on u-channel Photoproduction 1h0'

Speaker: Christian Weiss (Jefferson Lab)

**Discussion
Session**

Workshop Whitepaper Discussion and drafting

- **Discussion will be led by Christian**
 - Floor is open to everybody
 - **A discussion agenda will be prepared during the workshop by Christian.**
 - Feel free to message discussion topic to Christian or session convenors during or before the discussion sessions.
 - Direct comments are also welcomed.
- **Discussion Objective:**
 - **Come up with a whitepaper outline**
- **Drafting of Whitepaper (10 pages):**
 - Coordination: Wenliang (Bill) Li.
 - Individuals will be approached to contribute small written sections on the presented topics.



Gratitudes

- Workshop presenters and conveners.
- Special thanks for funding support by The Jefferson Science Association (JSA) through the initiative funding program, Jefferson Lab management and William & Mary.
- Most importantly, thanks to all participants.

Any Questions before we begin?

