Workshop on Physics and Engineering Opportunities at the Electron-Ion Collider 2016

Report of Contributions

https://indico.global/e/2182

Contribution ID: **1** Type: **not specified**

Welcome

Presenter: SOKHAN, Daria (University of Glasgow, UK)

Session Classification: Introduction

Contribution ID: **2** Type: **not specified**

EIC Overview (Title TBA)

Presenter: DESHPANDE, Abhay (Stony Brook University)

Session Classification: Introduction

Contribution ID: **3** Type: **not specified**

eRHIC (Title TBA)

Ferdinand Willeke

Session Classification: Accelerators

Contribution ID: **4** Type: **not specified**

JLEIC (Title TBA)

Presenter: PILAT, Fulvia (Department of Physics)

Session Classification: Accelerators

Contribution ID: **5** Type: **not specified**

JLEIC: Physics and Guiding Concepts for its Design

Friday 14 October 2016 09:00 (1 hour)

Presenter: YOSHIDA, Rikutaro (Argonne National Laboratory (US))

Contribution ID: **6** Type: **not specified**

EIC@BNL - Energy Reach - Physics and Detectors

Friday 14 October 2016 10:00 (1 hour)

Presenter: ASCHENAUER, Elke-Caroline (BNL)

Contribution ID: **7** Type: **not specified**

Next-generation nuclear DIS: spectator tagging with light ions at an EIC

Friday 14 October 2016 13:45 (30 minutes)

An Electron-Ion Collider (EIC) would enable next-generation measurements of DIS on light nuclei (deuteron, 3He, ...) with detection of nucleons and fragments in the forward region and measurement of their recoil momentum ("spectator tagging"). Such experiments allow one to control the nuclear configuration during the high-energy process and could be used for (a) precision measurements of neutron spin structure in electron-deuteron DIS with proton tagging, eliminating nuclear binding through on-shell extrapolation in the recoil momentum; (b) controlled measurements of the nuclear modifications of quark/gluon densities (EMC effect) in defined nuclear configurations; (c) novel studies of diffraction and nuclear shadowing at x « 0.1. We review the physics applications of spectator tagging at EIC, summarize the experimental and theoretical challenges, and report process simulations and physics impact studies from a dedicated R&D project.

Presenter: COSYN, Wim

Contribution ID: **8** Type: **not specified**

EIC Tracker R&D at CEA Saclay

Friday 14 October 2016 12:10 (25 minutes)

Presenter: SABATIÉ, Franck (CEA Saclay)

Contribution ID: **9** Type: **not specified**

3D Nucleon Studies towards EIC (an Italian View)

Friday 14 October 2016 11:30 (40 minutes)

Presenter: CONTALBRIGO, Marco (Dipartimento di Fisica)

Contribution ID: **10** Type: **not specified**

Particle identification for a future EIC detector

Friday 14 October 2016 15:00 (40 minutes)

Particle identification (PID) is an essential capability for a future EIC detector, required for flavor tagging in SIDIS, background suppression for open charm, and other key parts of the physics program. The necessity of incorporating a wide range of PID systems for both hadron and lepton identification, with significant variations in requirements at different rapidities, also gives detectors intended for the EIC a unique character. Not surprisingly, PID thus constitutes an important of the Generic Detector R&D for an Electron Ion Collider program. This talk will give an overview of the ongoing R&D efforts, focusing on Cherenkov systems for hadron ID, and suggest opportunities for involvement and future collaboration.

Presenter: NADEL-TURONSKI, Pawel

Contribution ID: **11** Type: **not specified**

Positron opportunities at JLab and a future EIC

Presenter: VOUTIER, Eric (LPSC/IN2P3/CNRS - UJF - INP)

Contribution ID: **12** Type: **not specified**

Discussion and closing remarks

Friday 14 October 2016 15:40 (40 minutes)

Presenter: SOKHAN, Daria (University of Glasgow, UK)

Contribution ID: **13** Type: **not specified**

Welcome and opening remarks

Thursday 13 October 2016 13:50 (10 minutes)

Presenter: SOKHAN, Daria (University of Glasgow, UK)

Contribution ID: **14** Type: **not specified**

Electron Ion Collider: The next QCD frontier for Understanding the Glue that Binds Us All

Thursday 13 October 2016 14:00 (1 hour)

Despite many decades of theoretical and experimental effort around the world, some of the most important questions in QCD remain unanswered: How does a proton get its spin? What roles do spin alignment and orbital angular momenta of the gluons play in this? Similarly, on the high energy frontier: What happens to gluon densities of nucleons and nuclei at very high energy? Does the glue in nucleon and all nuclei show identical behavior at high energy and form a unique form of gluonic matter, the so called, "Color Glass Condensate"? How would we investigate this experimentally? What can we learn about Confinement in QCD based on investigations of gluons in nucleons and nuclei? These are the sort of questions that form the backbone of the science case for the future Electron Ion Collider (EIC), that no other current or proposed facility can address with high precision. The EIC was recently recommended by the US Nuclear Science Advisory Committee (NSAC) as the highest priority future facility to built in the US after the completion of FRIB (The Facility for Rare Isotope Beams, currently under construction) in the US. In this talk, I will present a brief review of selected physics topics and their associated measurements, and the road map for the realization of this Collider.

Presenter: DESHPANDE, Abhay (Stony Brook University)

Contribution ID: **15** Type: **not specified**

eRHIC, Design of an Electron Ion Collider at Brookhaven Natl Laboratory

Thursday 13 October 2016 15:00 (1 hour)

Brookhaven National Laboratory is preparing a proposal for eRHIC, an electron ion collider with a peak luminosity of 10ˆ33 cmˆ-2sˆ-1, upgradable to 10ˆ34 cm-2s-1 and center of mass energies which range from 20 GeV to 140 GeV. ERHIC is designed to provide access to the entire Electron Ion collision physics program. A major component of eRHIC is the RHIC collider together with its injector complex for protons and heavy ions which require only minor modifications to provide the ion beams for eRHIC. The electron part of eRHIC is based on a multi-turn superconducting energy recovery linac which will provide spin polarized electrons of up to 18 GeV. In an effort to minimize technical risks, a solution based of an electron storage ring is being worked out as an alternative solution with similar collider performance. The presentation will discuss both solutions and will describe the ongoing R&D program which is carried out to finalize the conceptional eRHIC design.

Presenter: WILLEKE, Ferdinand

Contribution ID: **16** Type: **not specified**

JLEIC: Overview of the Jefferson Lab Accelerator Design and R&D

Thursday 13 October 2016 16:20 (1 hour)

Presenter: PILAT, Fulvia (Department of Physics)

Contribution ID: **17** Type: **not specified**

Discussion

Thursday 13 October 2016 18:00 (30 minutes)

Contribution ID: **18** Type: **not specified**

Positron opportunities at JLab and a future EIC

Thursday 13 October 2016 17:20 (40 minutes)

Presenter: VOUTIER, Eric (LPSC/IN2P3/CNRS - UJF - INP)

Contribution ID: **19** Type: **not specified**

UK R&D on silicon tracking and vertexing for the EIC

Friday 14 October 2016 14:15 (25 minutes)

Presenter: GONELLA, Laura (University of Birmingham (UK))