# The 2023 CFNS-CTEQ Summer School

# of the Electron-Ion Collider

# on the Physics

# WELCOME TO THE 2023 CFNS-CTEQ SUMMER SCHOOL

Welcome to the 2023 CFNS-CTEQ Summer School dedicated to the physics of the Electron-Ion Collider



The Electron-Ion Collider is at a very mature stage and your participation in the project is crucial for its success!

#### It is our fourth school, the first was in 2019 with 25 students the second was online in 2021 with 63 students

#### The third was in 2022 with 20 students in person and 30 online

**Students** 



#### We have 40 in-person students this year and we are looking forward to a very exciting time

# THE SCHOOL ORGANIZERS

Organizing Committee:

- Ross Corliss (SBU)
- Abhay Deshpande (SBU, CFNS Director)
- Prakhar Garg (PSU)
- Wenliang "Bill" Li (SBU)
- Fred Olness (SMU)
- Alexei Prokudin (PSU Berks, School Chair)
- Zack Sullivan (IIT)

Administrative support:

- Socorro Delquaglio (SBU)
- Rachel Nieves (BNL)
- Marlene Vera-Viteri (SBU)

## **Center for Frontiers in Nuclear Science**



# THE ELECTRON-ION COLLIDER @ BNL



# THE ELECTRON-ION COLLIDER: SCIENTIFIC QUESTIONS

- How do the nucleonic properties such as mass and spin emerge from partons and their underlying interactions?
- How are partons inside the nucleon distributed in both momentum and position space?
- How do color-charged quarks and gluons, and jets, interact with a nuclear medium? How do the confined hadronic states emerge from these quarks and gluons? How do the quark-gluon interactions create nuclear binding?
- How does a dense nuclear environment affect the dynamics of quarks and gluons, their correlations, and their interactions? What happens to the gluon density in nuclei? Does it saturate at high energy, giving rise to gluonic matter or a gluonic phase with universal properties in all nuclei and even in nucleons?

White Paper (2012) Accardi et al, arXiv:1212:1701

# **THE SCHOOL LECTURERS: FIRST WEEK**



George Sterman (SBU)







Iain Stewart (MIT) Huey-Wen Lin (MSU)



Todd Satogata (JLab)



John Lajoie (ISU)

#### Ernst Sichtermann (LBL)



#### Thomas Britton (JLab)

# **THE SCHOOL LECTURERS: SECOND WEEK**



#### Oleg Eyser (BNL)







Sally Dawson (BNL) Raju Venugopalan (BNL) Timothy Hobbs (ANL) Anna Stasto (PSU)



#### Wouter Deconinck (UManitoba)



#### Ciprian Gal (JLab)





Vladimir Korepin (SBU)

# THE SCHOOL SCHEDULE

- The school runs in person 9:00 am 3:30 pm ET US.
- In the evening we have <u>recitations/discussion</u> at 7:30 pm (snacks & drinks are provided)
- The program is posted on Indico: https://indico.bnl.gov/event/17958/timetable/#20230605

# DINING OPTIONS: LUNCH SUGGESTION

# **MAY 29 TO JUNE 30**

### **DUNKIN'** AT SAC MARKET

Monday to Friday 8:30am to 3pm Saturday and Sunday 10am to 6pm (Closed 6/17 and 6/18, Open 8:30am to 3pm on 6/24 and 6/25)

#### SAC FOOD COURT AT SAC SEAWOLVES PIZZA, KICKIN' CHICKIN, GRILL

Monday to Friday 11am to 7pm

Saturday and Sunday CLOSED (Open 6/17 and 6/18 from 8:30am to 3pm)

## STARBUCKS EAST AT EAST SIDE DINING

Monday to Friday 9am to 3pm Saturday and Sunday CLOSED



### Lunch Suggestion: Since we have only 90mins for lunch, we suggest the on-campus SAC option.

We will lead you there after the morning lectures.

# **DINING OPTIONS: DINNER SUGGESTION**



Since we have a bit more time for dinner,

you might want to try some of the off-campus options near the LIRR.

We then return at 7:30 for snacks and a relaxing discussion session

### **Dinner Suggestion:**