

Nuclear Science at GSU

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Outline

- Georgia State University (GSU)
- Nuclear Physics Group
- Research projects
- Challenges and opportunities

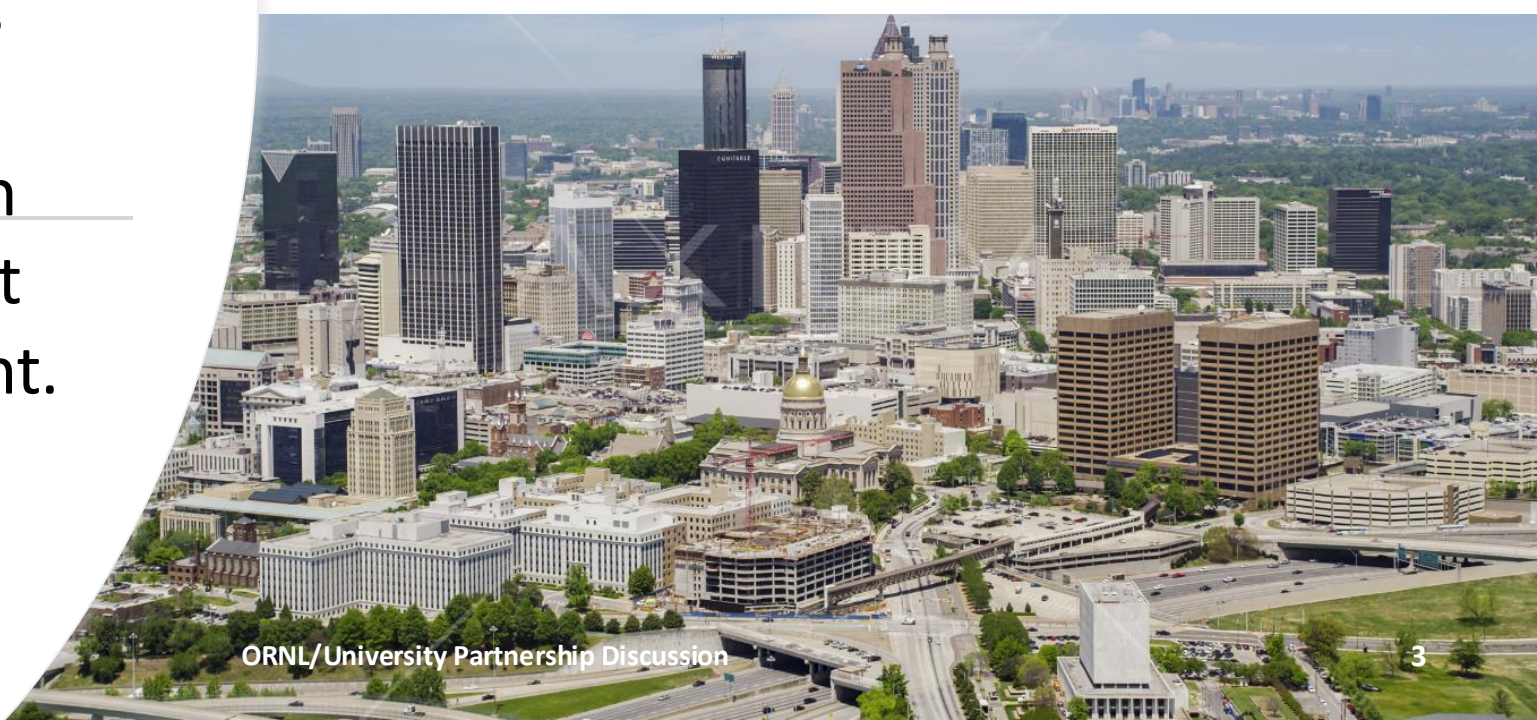


GSU is located in downtown Atlanta

The university's main campus is situated in the heart of downtown Atlanta, making it an integral part of the city's vibrant and dynamic urban environment.



College of Arts and Sciences



NUCLEAR PHYSICS GROUP

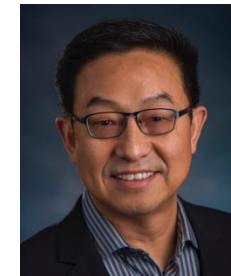
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INTERNAL PAGES



Yang-Ting Chien, Megan Connors, Murad Sarsour, and Xiaochun He



PHENIX EXPERIMENT AT RHIC

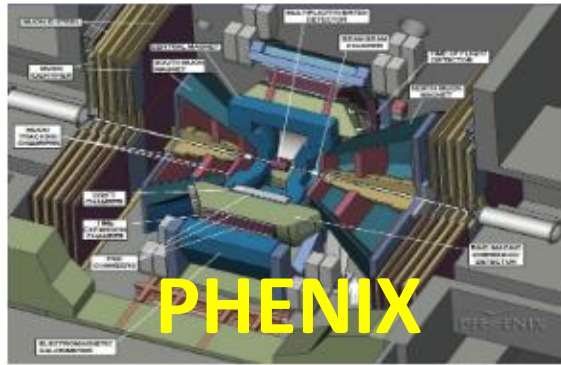
PHENIX is a detector designed to study high energy collisions of heavy ions.

Postdocs: 1 + 1 (to be hired)
Graduate students: 9 + 6(new)
Undergraduate students: 8

<http://phynp6.phy-astr.gsu.edu/>

Main Research Activities

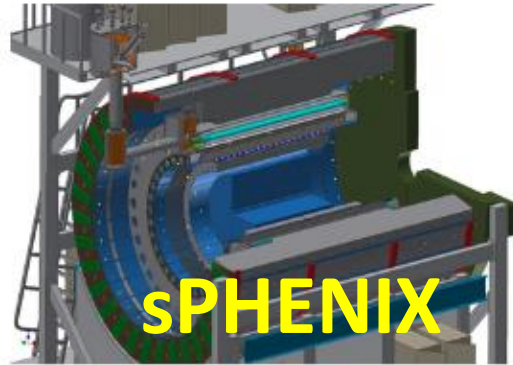
Data Taking Period 2000 - 2016



The Nuclear Physics Group is one of the original members of the PHENIX Collaboration. The experiment started taking data in 2000 and was ended in 2016. Our faculty, postdocs, and students (both graduate and undergraduate) participated all years of data taking and made significant contributions toward publishing many important results from PHENIX.

[Read more »](#)

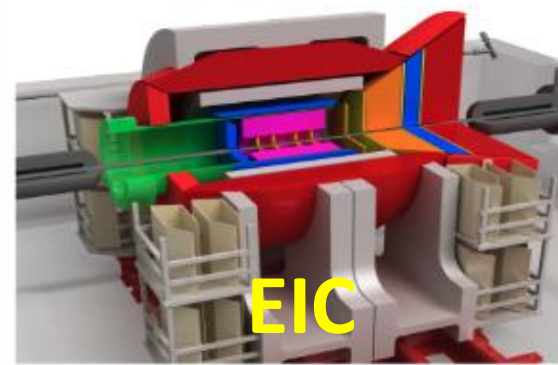
Data Taking Period 2023 - 2025



The Nuclear Physics Group at Georgia State University is a member of sPHENIX Collaboration since its very beginning. The group has played significant roles in building the sPHENIX Hadronic Calorimeter, called HCal, from GEANT4 simulation, prototyping studies, and detector constructions. The sPHENIX experiment is scheduled to take data in early 2023.

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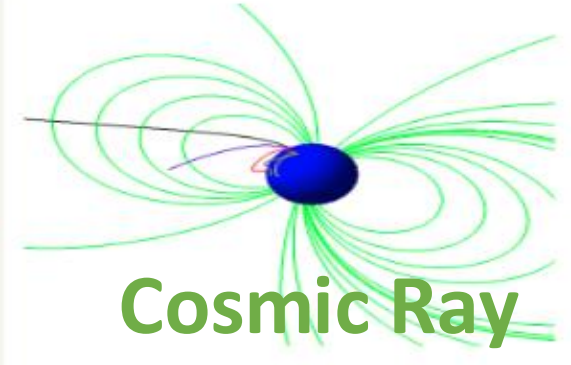
Data Taking Period from 2034 -



The Electron-Ion Collider (EIC) project will advance our knowledge of the origin of many properties of matter. It is being built at Brookhaven National Laboratory. One of the key experiments is the identification of quarks and gluons. The Nuclear Physics Group at GSU is participating in the development of the Cherenkov particle identification.

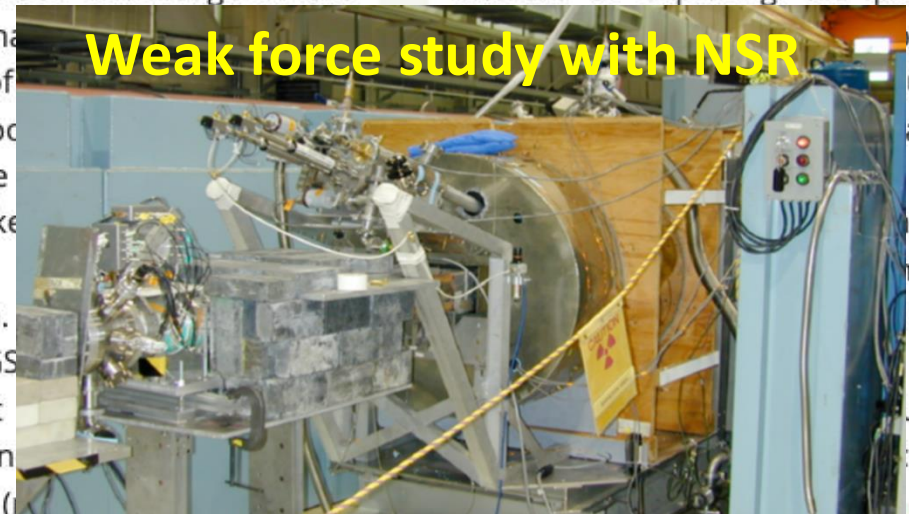
[Read more »](#)

Data Taking Period – long-term



In recent years, there is a growing interest of exploring the practical applications of nuclear physics. Cosmic rays are high-energy particles that originate from outer space and interact with the Earth's atmosphere. The Nuclear Physics Group at GSU is involved in the development of detectors for cosmic ray studies.

[Read more »](#)



<http://phynp6.phy-astr.gsu.edu/>





Building cosmic ray detectors

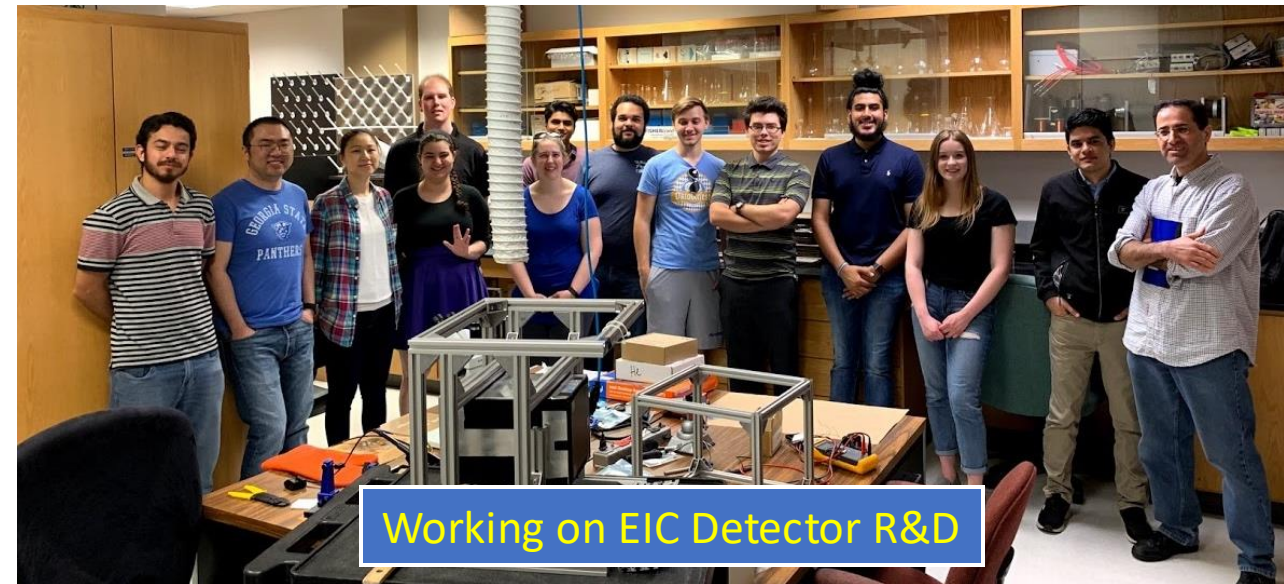


Testing sPHENIX scintillator tiles

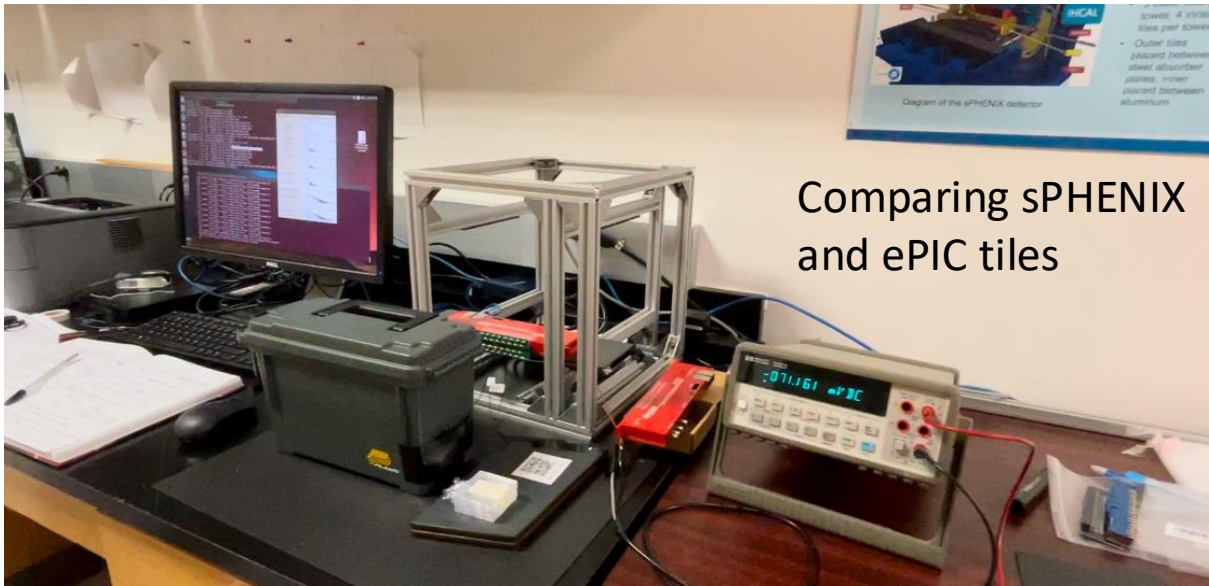
We have four lab rooms for our group mainly used for sPHENIX, EIC and gLOWCOST cosmic ray network development.



Testing sPHENIX scintillator tiles



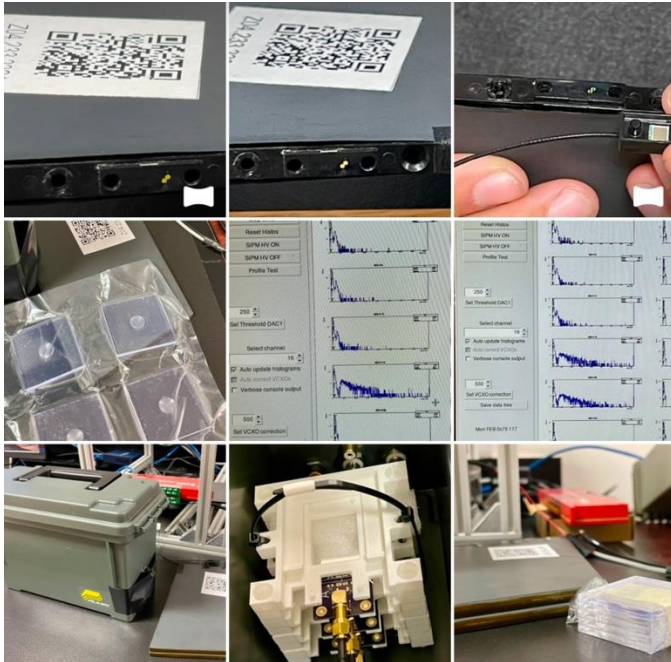
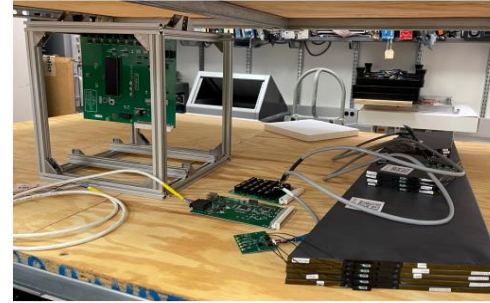
Working on EIC Detector R&D



Comparing sPHENIX and ePIC tiles

HCal Tower Test Stand (in Rm120 NSC) Update

Tile stability and performance test



gLOWCOST detector network development



Challenges and Opportunities

- Limited funding, a generic problem for everyone!
- Need to balance the priorities given many concurrent projects in the group.
- A large number of graduate and undergraduate students actively involved in our project
- Extensive experience in hardware and GEANT4 simulation
- Broad physics interests: Jets, heavy flavor production in HI collisions, etc.
- STEM outreach

Thank you

About GSU

- Georgia State University (GSU) is a public research university located in downtown Atlanta, Georgia, United States. It was founded in 1913 as the Georgia School of Techno-Mechanical Arts, and over the years, it has grown and evolved into a comprehensive university offering a wide range of academic programs.
- GSU is known for its urban campus, diverse student body, and strong emphasis on research and community engagement. The university offers more than 250 undergraduate and graduate degree programs across various disciplines, including business, arts and sciences, education, health sciences, law, and more. It is organized into 10 colleges and schools, including the J. Mack Robinson College of Business, College of Arts and Sciences, College of Education and Human Development, College of Law, and College of Health and Human Sciences.
- The university is committed to providing a high-quality education to its students and has a reputation for innovation in teaching and learning. It is recognized for its programs in business, law, public health, social sciences, and computer science, among others. GSU is also known for its strong research initiatives and has received significant funding for various research projects.
- In recent years, Georgia State University has made significant strides in improving its graduation rates and student success. It has implemented programs and initiatives aimed at supporting student retention and completion, particularly for students from diverse backgrounds and low-income families.
- As a leading urban institution, GSU is closely connected to the city of Atlanta and offers numerous opportunities for internships, experiential learning, and community involvement. The university's location provides students with access to cultural institutions, businesses, and organizations in the heart of the city.
- Overall, Georgia State University is a dynamic and vibrant institution that combines academic excellence, research, and community engagement to prepare students for success in their chosen fields.