Workshop Summary:

Fixed-Target at the EIC (FIXE)

Charles Joseph Naïm & Agnieszka Sorensen

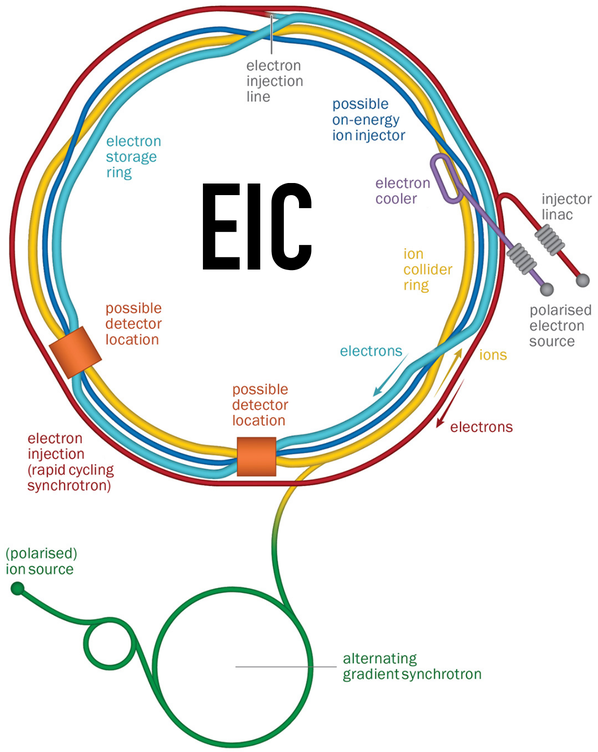
2026 RHIC/AGS Annual Users' Meeting

The EIC is not just a collider:

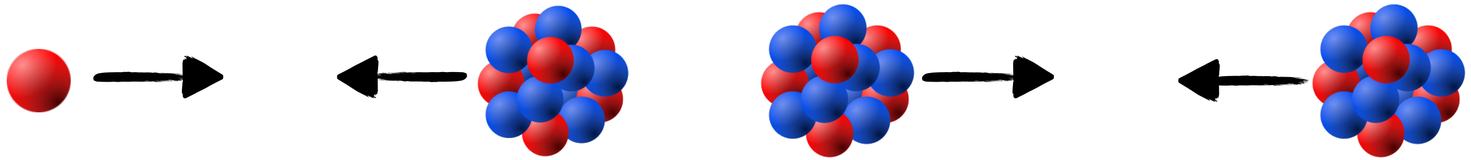
it is a major long-term investment in US nuclear science for decades to come

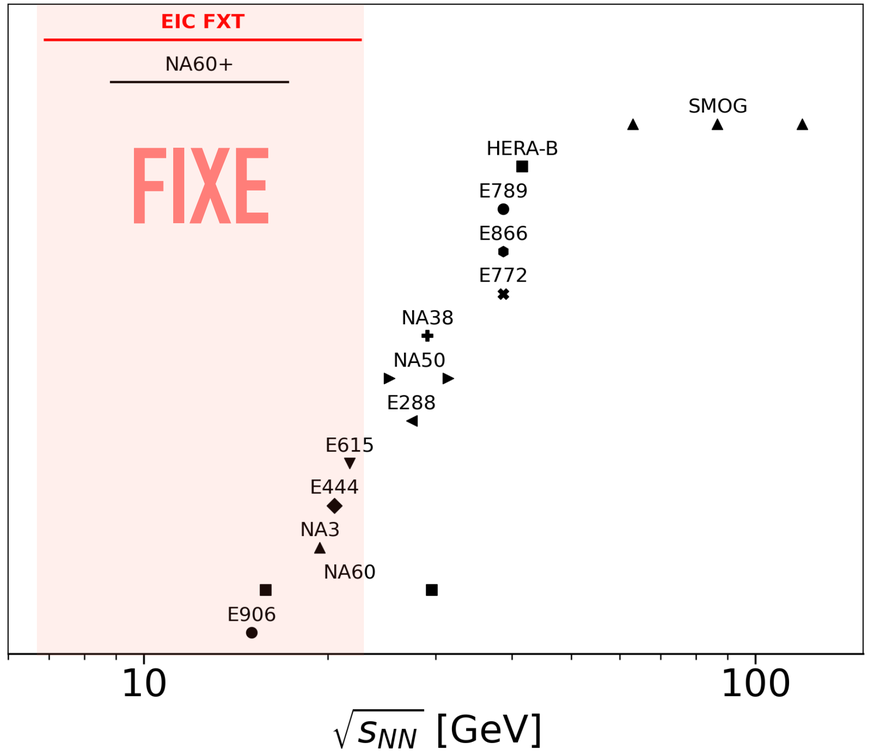
Can the physics reach of the EIC be larger than originally envisioned?

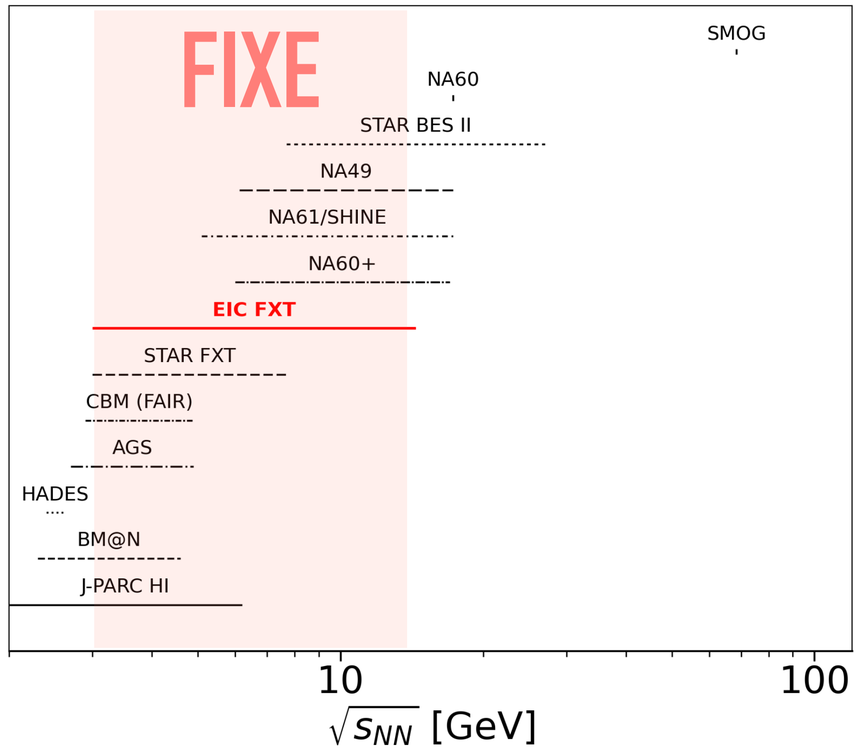
e+A collider



Ion beam fixed-Target





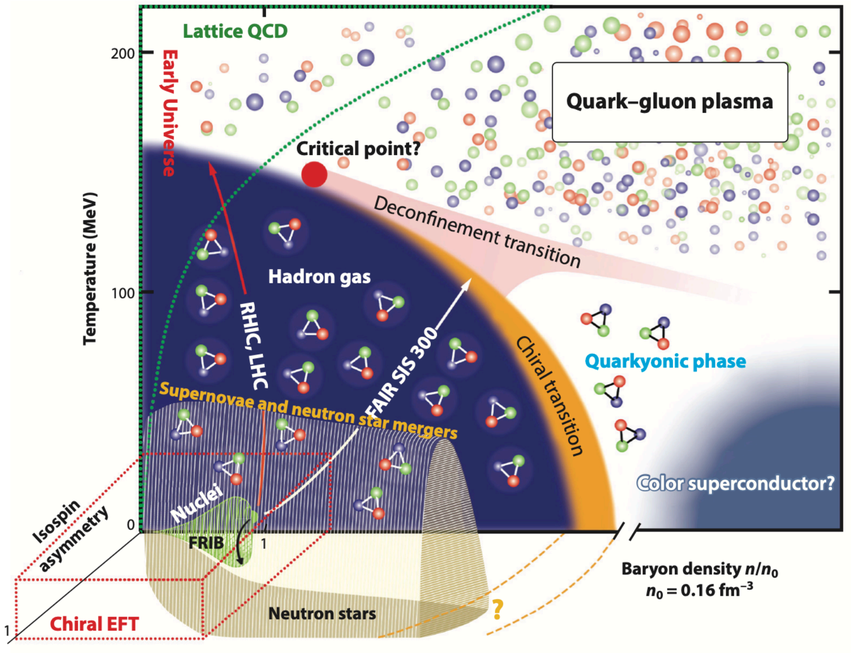


One experiment, two modes

A Fixe-Target at the EIC (FIXE) supports

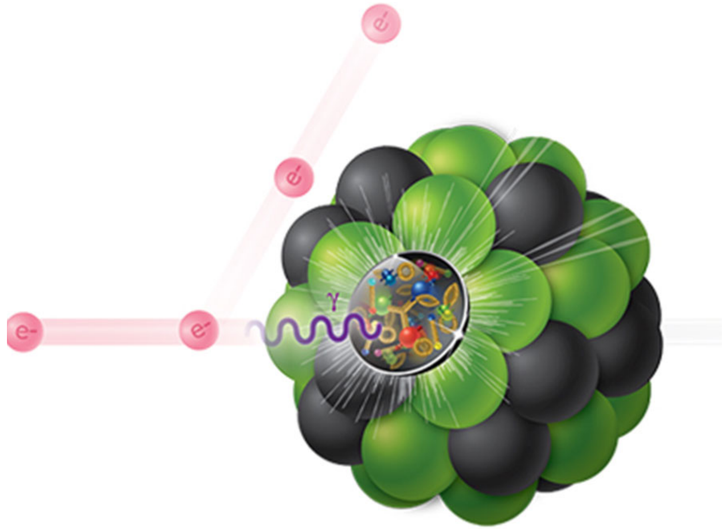
Continued US leadership in high-density QCD studies

Synergy with cosmic ray & space exploration studies



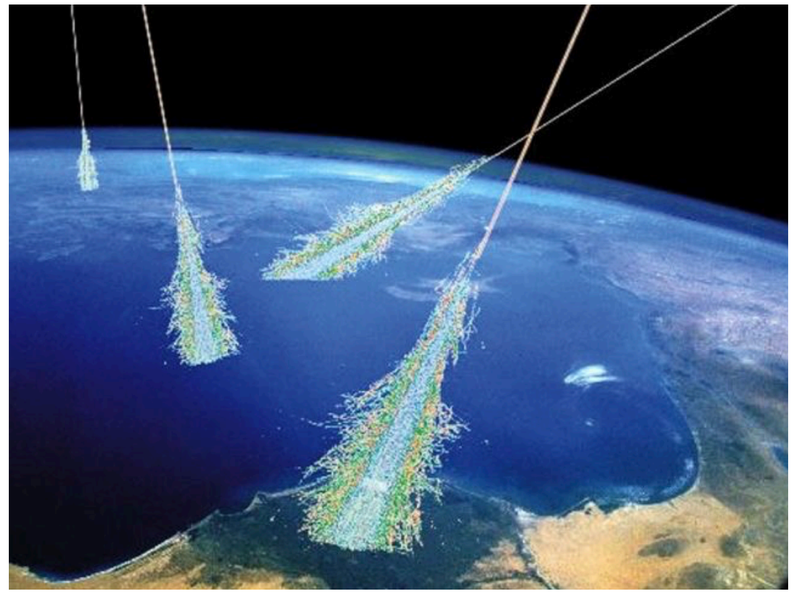
QCD Phase Diagram

Mapping dense nuclear matter



Cold Nuclear Matter

Understanding nuclear medium effects



Data for Space Radiation Protection

Supporting human deep-space missions

Objectives of the Initiative

- Establishing the Physics Case (**why?**)
- Sharing and Discussing This Opportunity (**how?**)
- Building a Community (**who?**)

CFNS Workshop

September 2025

White Paper

February 2026

RHIC/AGS Meeting

May 2026

This Workshop

QCD Phase Transition

Mikhail Stephanov
(University of Illinois)

Lipei Du
(LBNL)

Nuclear Data

Cosmic Rays

David Brown
(BNL)

Philip von Doetinchem
(University of Hawaii)

Cold Nuclear Matter

Ramona Vogt
(LLNL, UC Davis)

Cesar da Silva
(LANL)

Lessons Learned from the STAR FXT

Daniel Cebra
(UC Davis)

Fixed-Target Program at the EIC

Physics Case

Naïm et al. 2603.00265

First

ePIC

- Near term · low cost
- Feasible — like STAR FXT
- Partial physics coverage
  (not optimized for FT mode)

Later

Second Detector

- Long term · high cost
- Design for FT / collider mode (SMOG)
- Full physics coverage
- Longer timeline

Continue developing the best physics case
then balance: science reach · cost · time · optimization

Maintaining US leadership

- The US nuclear physics community achieved global leadership in high-temperature QCD through decades of RHIC research and groundbreaking results
- US expertise expanded via major contributions to the heavy-ion programs at the LHC (ALICE, ATLAS, CMS, LHCb)
- The LHC remains the only facility currently delivering high-energy heavy-ion collisions

Incorporating a **fixed-target program at the EIC will allow the US to sustain** and **extend world leadership in high-density QCD well into the 2030s and beyond**

QCD Phase Transition

Nuclear Data
Cosmic Rays

Cold Nuclear Matter

Three experiments
for the price of one