Update on DNP Planning for Community Workshops

NSAC

7/13/2022

Vicki Greene

U.S. DEPARTMENT OF ENERGY

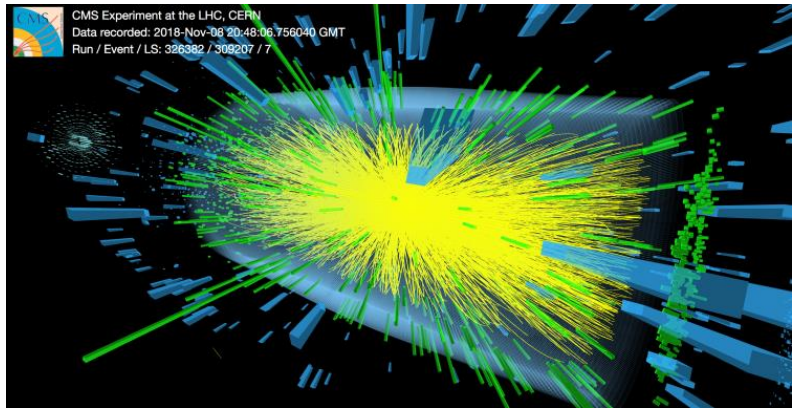
National Science Foundation
WHERE DISCOVERIES BEGIN

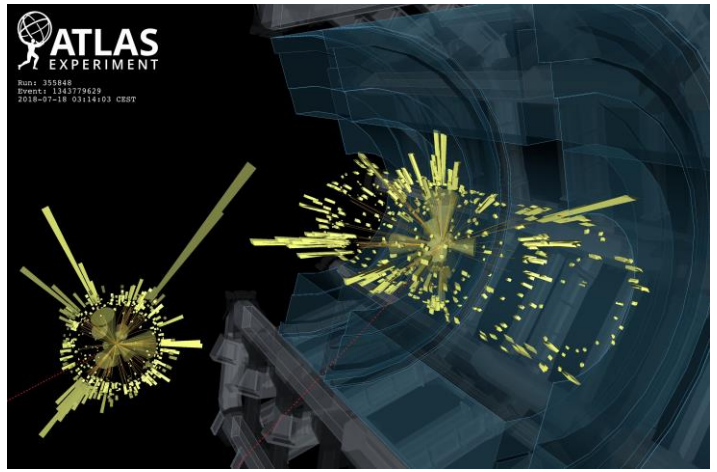
DNP Town Meetings

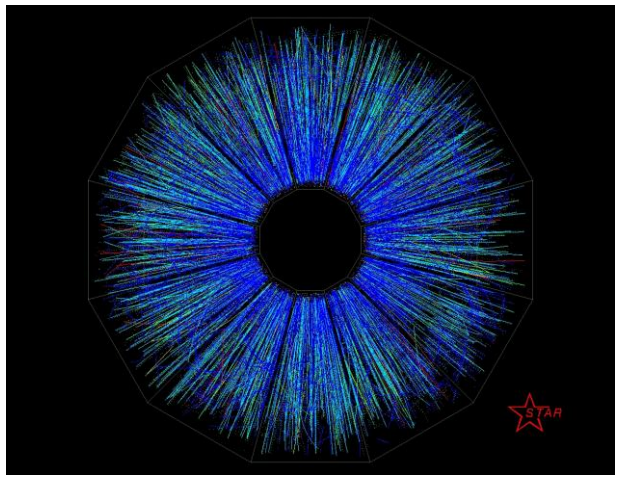
- 2002
  - Nuclear Structure and Astrophysics, Oakland, CA
  - Astrophysics, Neutrinos, and Symmetries, Oakland, CA
  - Electromagnetic and Hadronic Physics, JLAB
  - High Energy Nuclear Physics, BNL
  - Science Education and Outreach White Paper (no separate Town Meeting)
- 2007
  - Nuclear Astrophysics and the Study of Nuclei, Chicago, IL
  - Nuclear Science and the New Standard Model: Fundamental Symmetries and Neutrinos in the Next Decade, Chicago IL
  - Phases of QCD, Rutgers University
  - Hadronic Physics, Rutgers University
  - A Vision for Nuclear Science Education and Outreach for the Next Long Range Plan, BNL
  - Nuclear Science Enhancing American Competitiveness Through Basic Research, Chicago, IL
- 2015
  - Education and Innovation in Preparation for the 2015 Long Range Plan, NSCL/MSU
  - Nuclear Structure and Nuclear Astrophysics Meeting, Texas A&M
  - Fundamental Symmetries, Neutrinos, Neutrons, and Relevant Nuclear Astrophysics, Chicago, IL
  - Hadron and Heavy Ion QCD Meeting, Temple University
- 2022
  - Hot and Cold QCD
  - Nuclear Reactions, Structure, and Astrophysics
  - Fundamental Symmetries, Neutrinos, and Neutrons

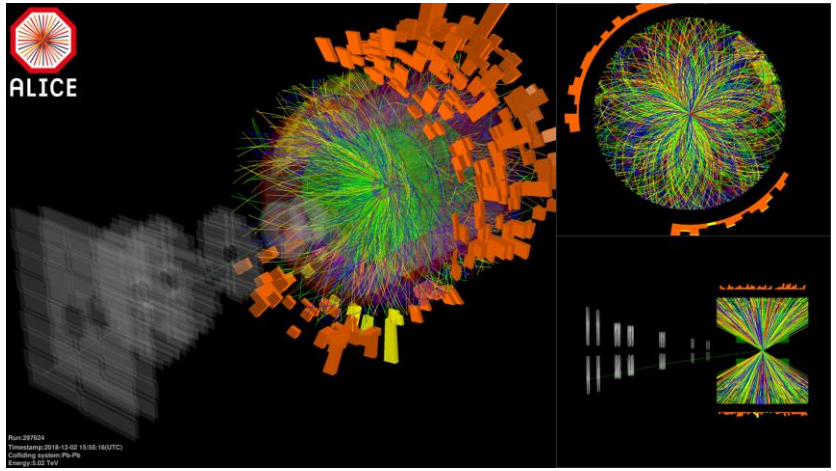
Hot and Cold QCD

Hot and Cold QCD





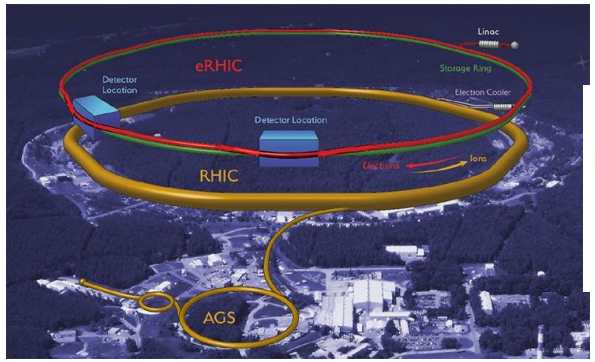


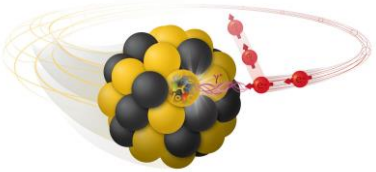


sPHENIX

Hot and Cold QCD

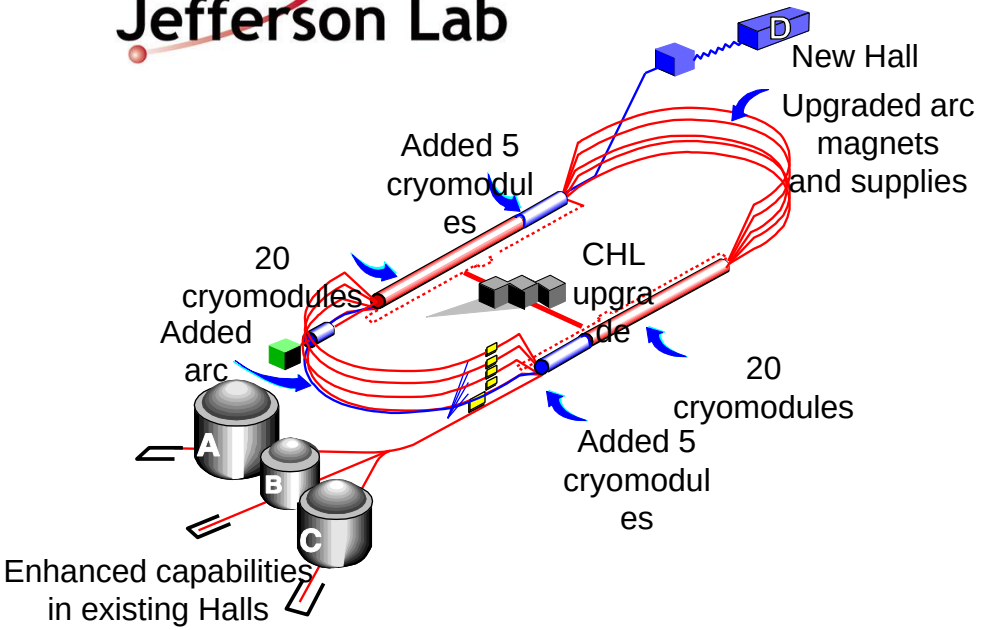
Brookhaven National Laboratory



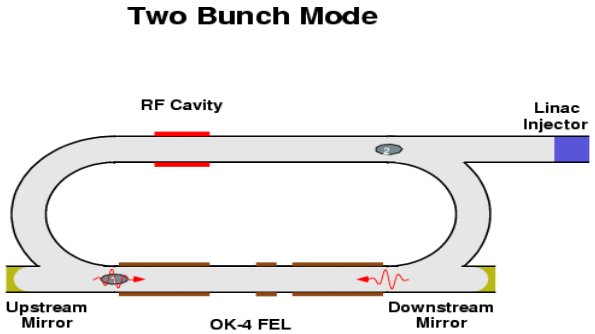


Electron Ion Collider

Jefferson Lab



mami MAINZER MIKROTRON



PAUL SCHERRER INSTITUT PSI

FNAL BNL JPARC GSI

HIγS Facility at TUNL

Created by Brent Perdue, 2005

BESIII BELLE CERN BABAR

DESY COMPASS Jefferson Lab EIC

Nuclear Reactions, Structure, and Astrophysics

Nuclear Reactions, Structure, and Astrophysics

Facility for Rare Isotope Beams
at Michigan State University

Argonne NATIONAL LABORATORY

LANSCE

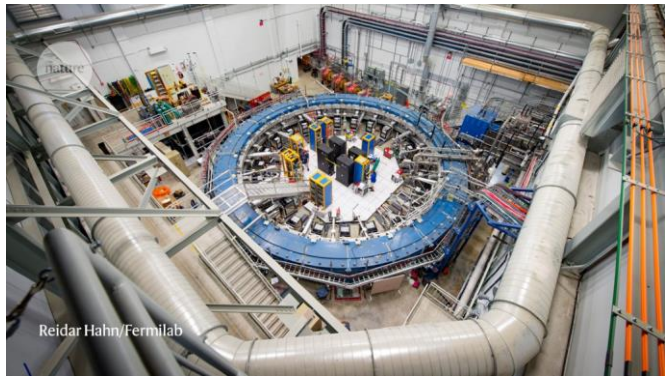
BERKELEY LAB

Fundamental Symmetries, Neutrinos, and Astrophysics

Fundamental Symmetries, Neutrinos, and Neutrons

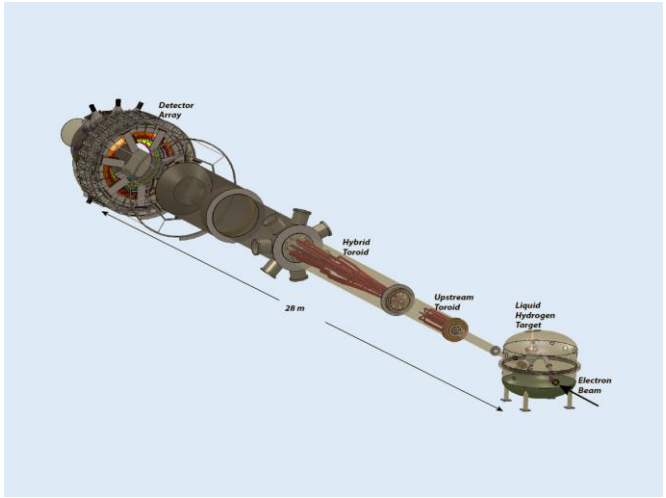
nEDM @SNS

Fermilab



Muon g-2

Jefferson Lab



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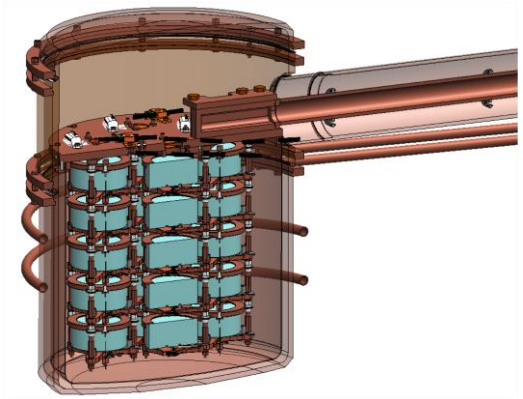
Fundamental Symmetries, Neutrinos, and Neutrons



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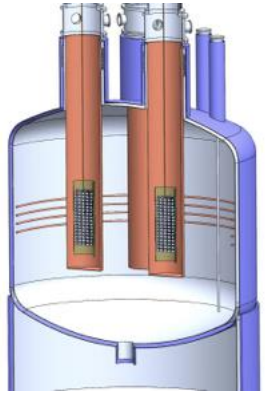
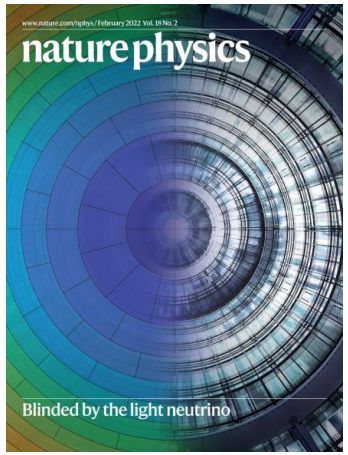
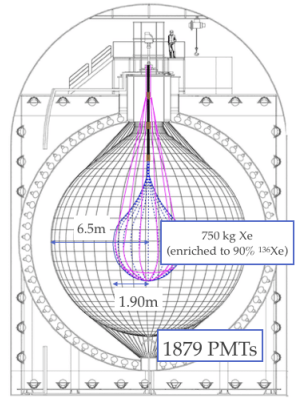


LEGEND 1000





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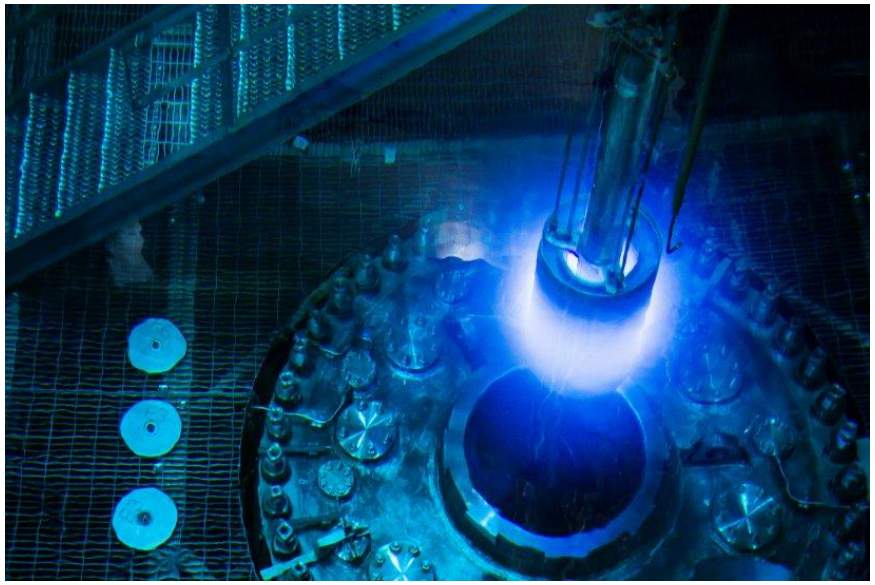
Fundamental Symmetries, Neutrinos, and Neutrons



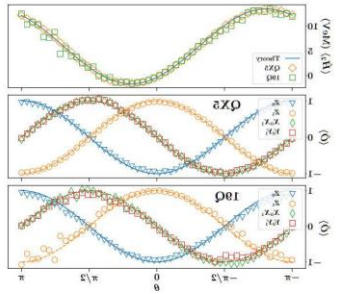
HFIR @ORNL

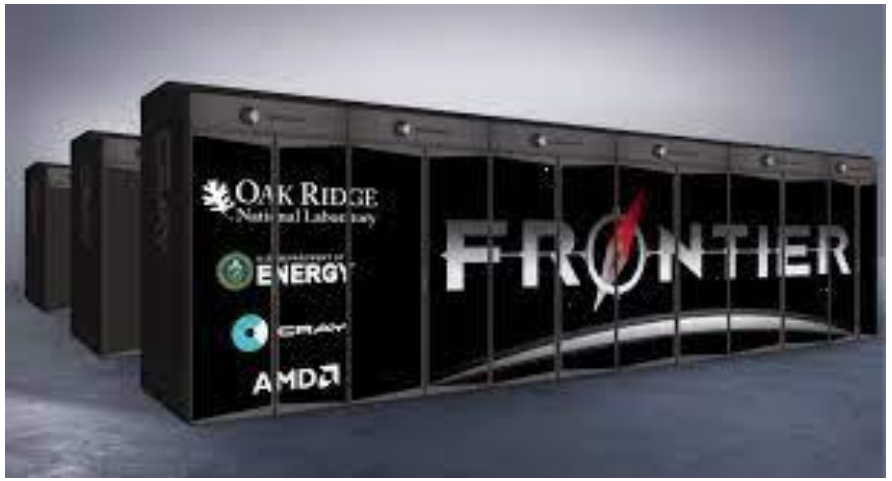
SNS @ORNL

Los Alamos NATIONAL LABORATORY

Nuclear Theory and Computing

WASHINGTON, D.C. - Today, the **U.S. Department of Energy (DOE)** announced $8 million for theoretical research in nuclear interactions, nucleon structure, and properties of nuclei and nuclear matter via collaborations that bring together leading nuclear scientists to address well-defined topical areas. *1/6/22*





Discovery Science Delivering for Society

	Hot & Cold QCD	Nuclear Reactions, Structure, & Astrophysics	Fundamental symmetries, neutrinos, & neutrons
Workforce Development			
Education Diversity			
Innovations / Applications			
Computing Accelerator and Detector Science Nuclear Data Isotope Science			

Draft Timeline for DNP contribution to NSAC Long Range Planning Process 2022-2023

- May/July 2022 DNP chair-line starts organizing and involves Executive Committee
  - Executive Committee
    - Presented with Town Hall topics from DNP chair line
    - Nominates conveners
    - Approves venue selection process
  - DNP Chair contacts conveners
  - Pre-planning for Town Halls
- July 2022
  - General email to the community outlining the process, announcing the Town Meetings, and inviting engagement.
  - July 2022— NSAC Charge letter
- September-November 2022 Town Meetings conducted
- October 2022 Special LRP Community Update at the DNP Fall meeting (10/27-30/22)
  - Talks by NSAC Chair, DNP Chair on the process, and brief reports from conveners of each Town Meeting.
- February 2023 White papers for each Town Meeting submitted
- October 2023
  - DNP Fall Meeting Plenary Session Devoted to LRP pending DNP Chair approval.

Town Hall Convenor Nominees

- Hot and Cold QCD
  - Topical: 38 nominees
  - Crosscutting: 35 nominees
- Nuclear Reactions, Structure, and Astrophysics
  - Topical: 17 nominees
  - Crosscutting: 56 nominees
- Fundamental Symmetries, neutrinos, and Neutrons
  - Topical: 24 nominees
  - Crosscutting: 42 nominees

Venues for Town Halls

- Seven institutions expressed interest
- Selection process underway
- In discussion with three venues
- Venues will be announced soon

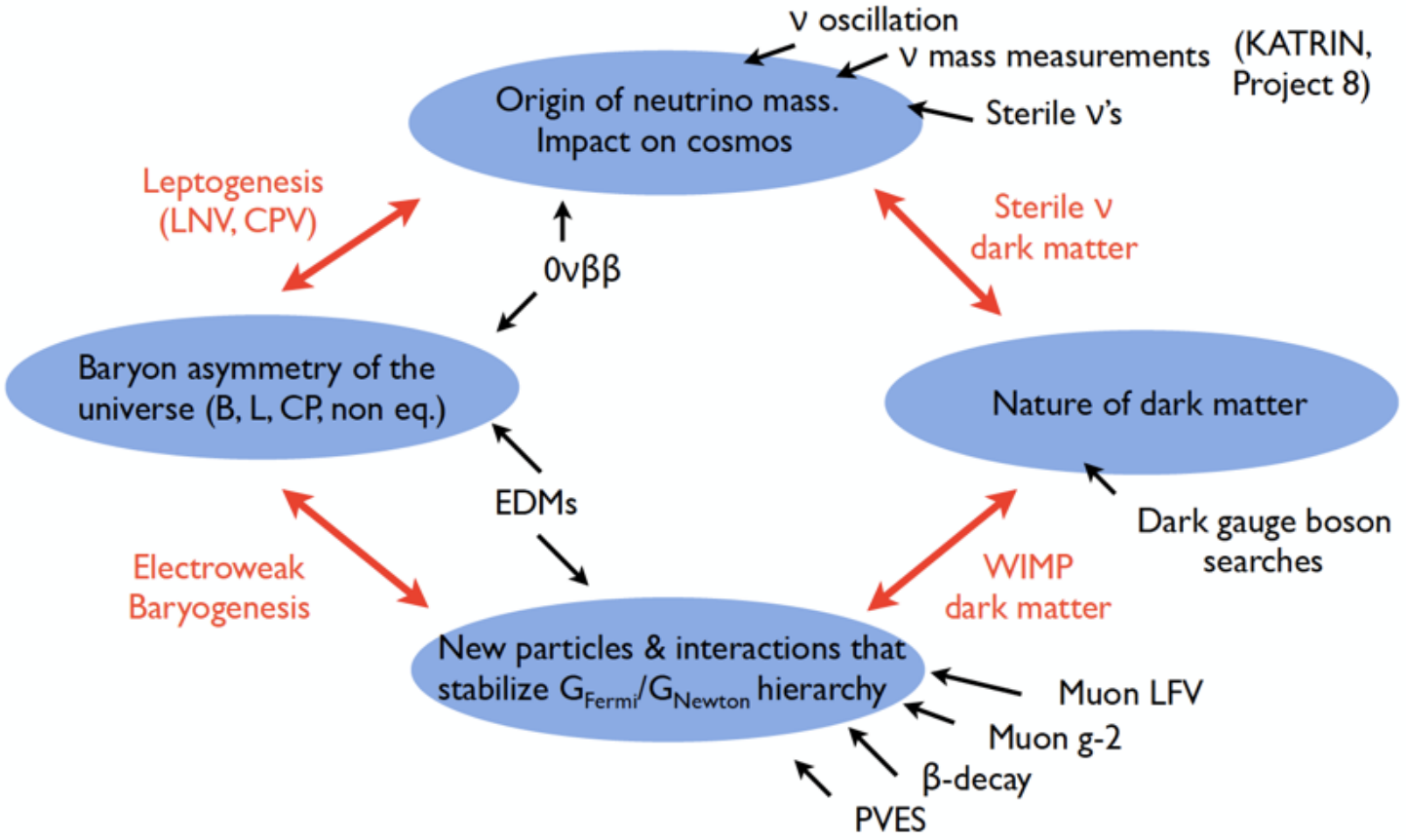
Other meetings and workshops are encouraged and expected

As an example, there is a newly proposed workshop:

- Computational and Theoretical Efforts in Nuclear Physics
- Organizers: Joe Carlson (LANL), Bronson Messer (ORNL), Witek Nazarewicz (FRIB/MSU), Amber Boehnlein (JLab), Robert Edwards (JLab), Allesandro Lovato (ANL), Phiala Shanahan (MIT), Peter Petreczky (BNL)
- Based on workshop hosted by SURA in 2014 to support the previous LRP

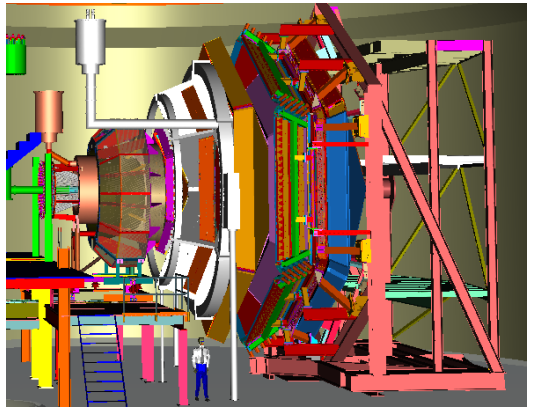
Backup Slides

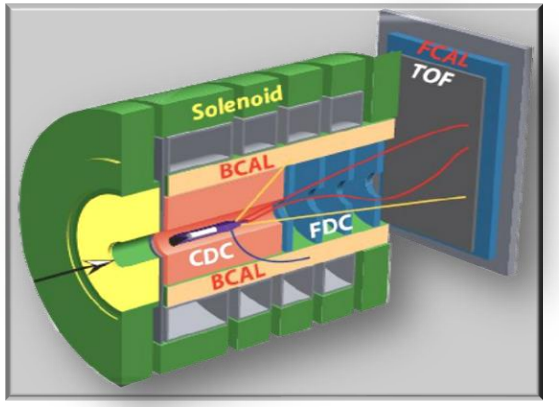
Fundamental Symmetries, Neutrinos, and Neutrons



12 GeV Upgrade Physics Instrumentation

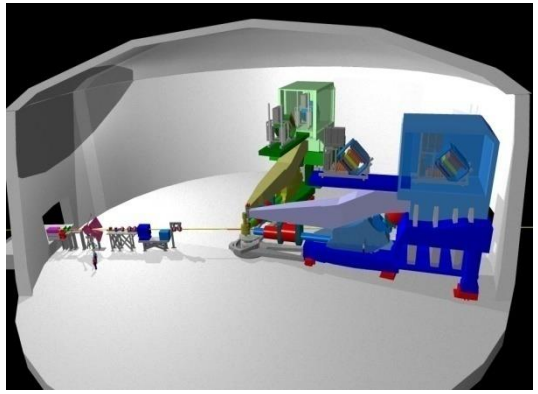
GLUEx (Hall D): **exploring origin of confinement by studying hybrid mesons**

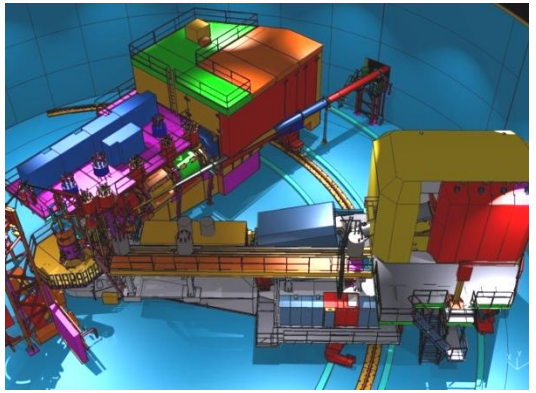




CLAS12 (Hall B): **understanding nucleon structure via generalized parton distributions**

SHMS (Hall C): **precise determination of valence quark properties in nucleons and nuclei**

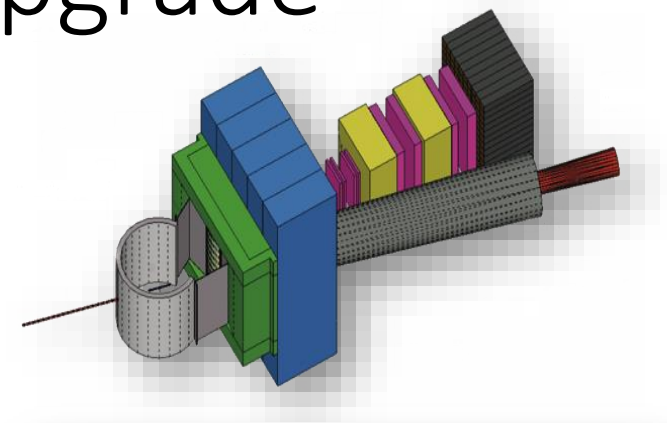




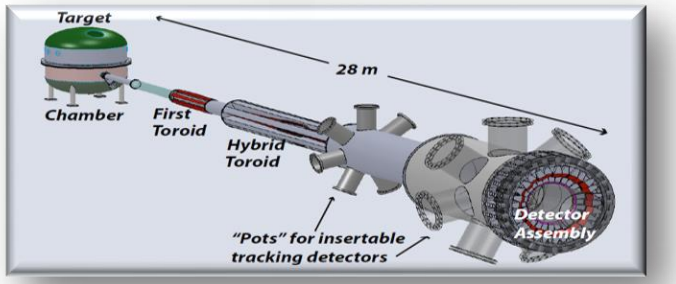
Hall A: **nucleon form factors,**
& future new experiments using new devices

Beyond the 12 GeV Upgrade

- **Super BigBite Spectrometer**
  - **high Q^2 form factors**
  - **SIDIS**

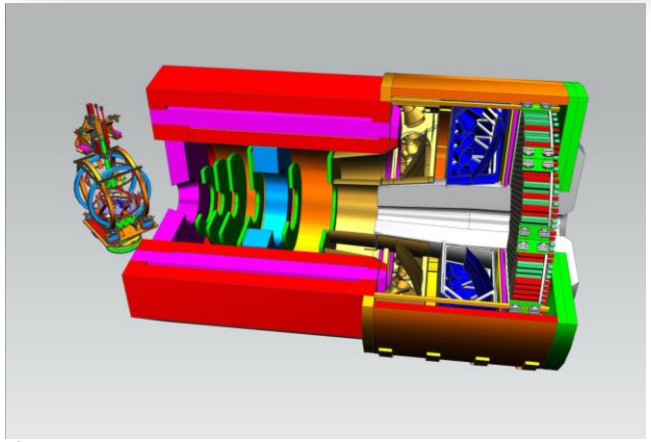


- **MOLLER experiment**
  Ongoing MIE
  - **Standard Model Test**



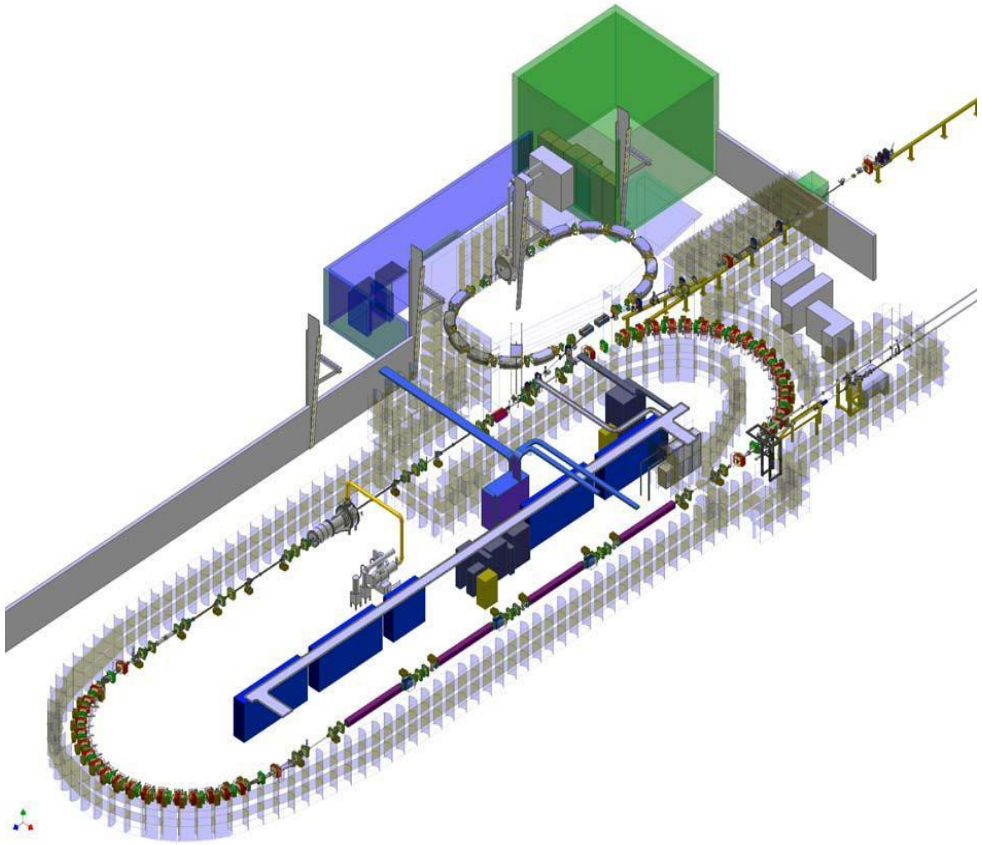
- **SoLID program**

  CLEO Solenoid
  Proton mass, spin and
  Standard Model Test



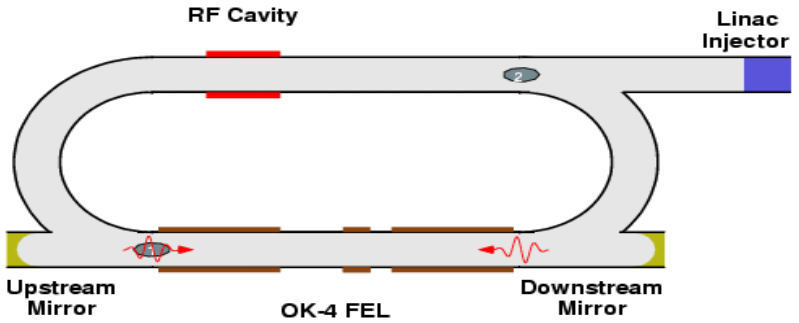
HIγS Facility at TUNL

Schematics of Duke Free Electron Laser



Beam Parameters	Values
Energies (MeV)	Up to 100 MeV
Polarization	~100 (circular or linear pol)

Two Bunch Mode



Created by Brent Perdue, 2005

H.R. Weller *et al*., Progress in Particle and Nuclear Physics 62, 257 (2009)