

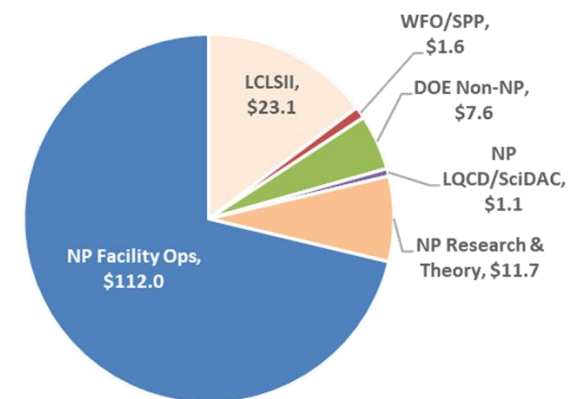
Welcome to Jefferson Lab



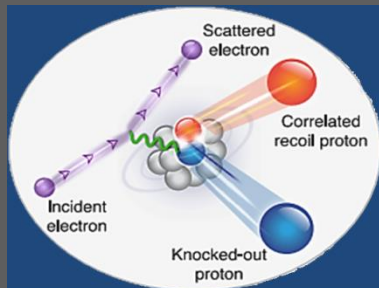
Jefferson Lab At-A-Glance

- **Created to build and operate the Continuous Electron Beam Accelerator Facility (CEBAF), world-unique user facility for Nuclear Physics:**
 - Mission is to gain a deeper understanding of the structure of matter
 - Through advances in fundamental research in nuclear physics
 - Through advances in accelerator science and technology
 - In operation since 1995
 - 1,630 Active Users
 - 188 Completed Experiments to-date (10 full, 23 partial from 12 GeV era) at mid April 2019
 - Produces ~1/3 of US PhDs in Nuclear Physics (630 PhDs granted to-date; 212 in progress)
- **Managed for DOE by Jefferson Science Associates, LLC (JSA)**
- **Human Capital:**
 - 693 FTEs
 - 28 Joint faculty; 33 Post docs; 20 Undergraduate students; 42 Graduate students
- **K-12 Science Education program serves as national model**
- **Site is 169 Acres, and includes:**
 - 69 Buildings: 883K SF
 - Replacement Plant Value: \$480M

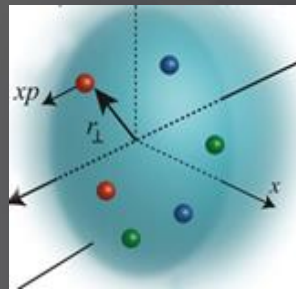
FY 18 LAB FUNDING BY FUNDING SOURCE
\$157.2M TOTAL



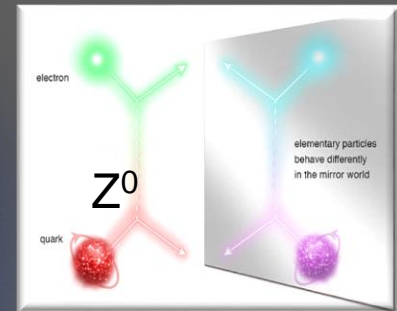
Jefferson Lab: A Laboratory For Nuclear Science



Nuclear Structure



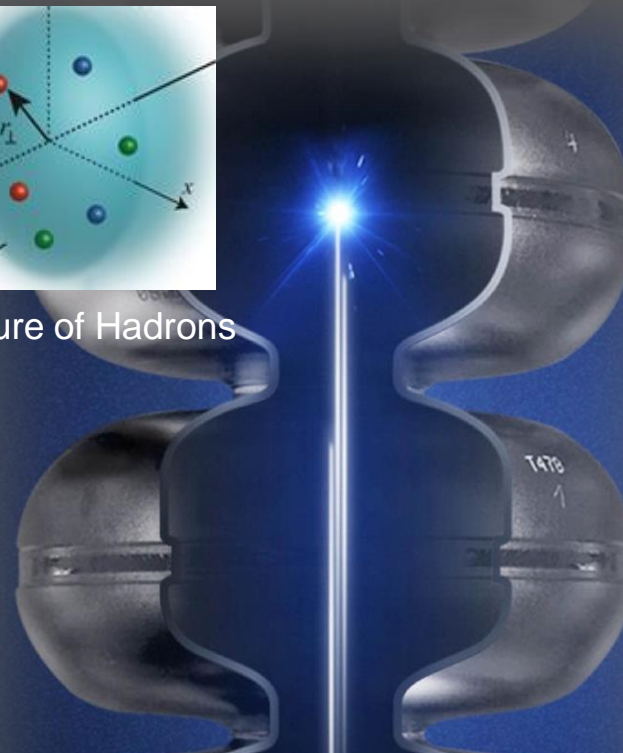
Structure of Hadrons



Fundamental Forces & Symmetries



Medical Imaging Technology



Cryogenics



Accelerator S&T



Nuclear Astrophysics



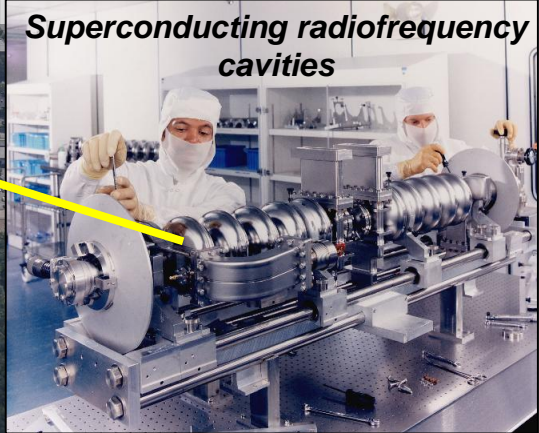
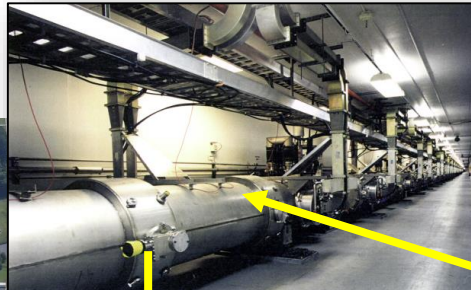
Theory & Computation

JEFFERSON LAB ACCELERATOR COMPLEX



Hall D

Cryomodules in accelerator tunnel

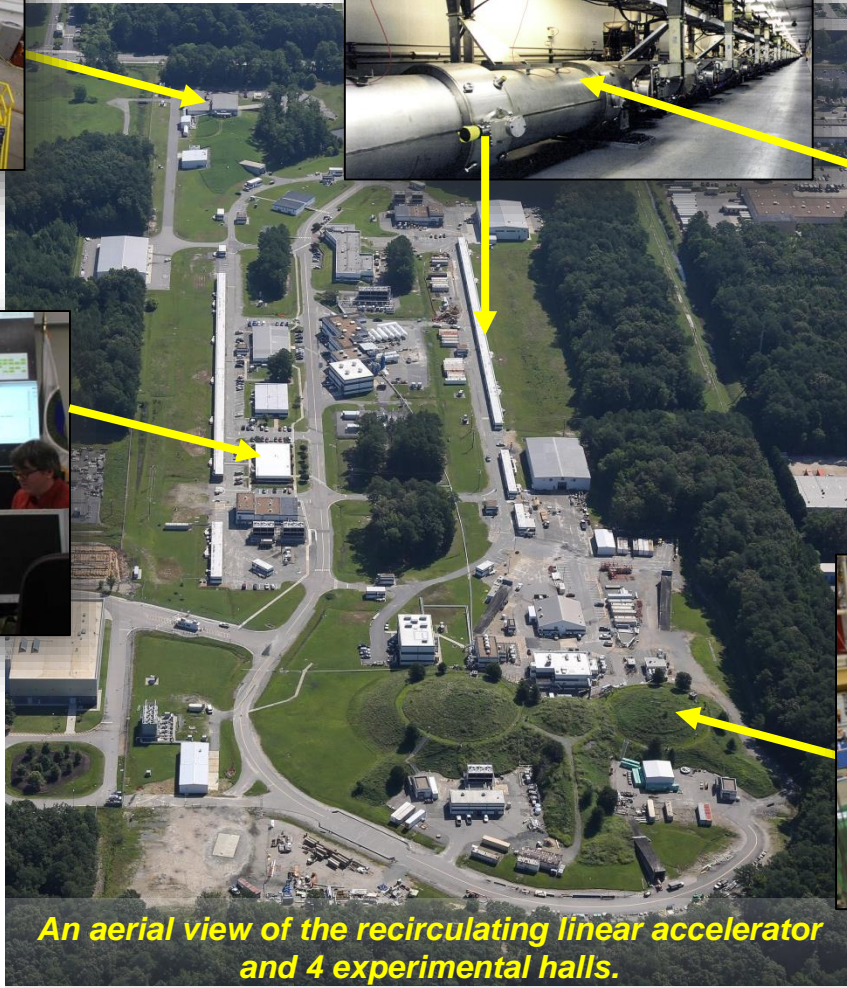


Superconducting radiofrequency cavities

SRF Cavities



Machine Control Center



An aerial view of the recirculating linear accelerator and 4 experimental halls.



Hall C

Advanced Computing Initiatives

Computation is crucial to all aspects of our NP Program

- Initiative 1: Physics Centered Computing Model for 12 GeV Physics Program and future Electron Ion Collider to insure experiment-theory integration
 - Modern computational and data science techniques and hardware technologies provide an opportunity to modernize the experimental computing paradigm.
 - Streaming readout: Innovation in Nuclear Data Readout and Analysis: start to end streaming tests with GEM detector underway
 - Extracting 3-D distributions from experimental data is a large scale computationally challenging inverse problem
- Initiative 2: Develop computational and data science methodology and infrastructure to realize the scientific goals of Nuclear Femtography.
 - Established Center for Nuclear Femtography in 2018
 - Topical areas: Visualization, imaging techniques QCD Theory, machine learning
- Initiative 3: Particle Accelerator Simulation and Operation
 - Focal area for 2020 is mining CEBAF operational data



- Instigated streaming readout consortium
 - 3 meetings so far
- INDRA Lab operational
- Invited talks on streaming at ASCR workshops
- Invited talk on Streaming Data at the DoE booth at Supercomputing 18
- Co-organized Virginia Symposium on Imaging & Visualization in Science
- Hosted HOW2019

Geant4 is a crucial tool for the 12 GeV program and for EIC studies!

A FEW NOTES

- CEBAF is SAD
 - ‘Scheduled Accelerator Down’
 - Enjoy the tours!
- Please wear your name badge at all time
- This is a public event at a DOE facility
 - Please stay in the public areas of the campus
 - *All information to be presented or discussed must meet DOE standards for public release and no information will be presented or discussed that is proprietary or protected from release by statute, regulation, DOE policy.*

SAFETY

- In Case of Fire Alarm
 - Proceed out the nearest exits
 - Please muster in the parking lot
 - We will be instructed when is safe to return
- In Case of a Tornado Alarm <Extremely unlikely>
 - Shelter inside
 - F113: stay in place.
- Ask a Safety Warden if you have questions.

Enjoy your time at Jefferson Lab!

