Welcome

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USQCD and Jefferson Lab Program

- Welcome! We’re very pleased to host this meeting!
- Understanding QCD and hadron structure is one of the key missions of the Jefferson Lab scientific program, carried out by our User Community
- It is very important that we provide the tools needed to enable the scientific community to be successful: accelerator complex, experimental capabilities, vibrant theory and computational sciences
- A vibrant LQCD community and capabilities are critical for maximizing science output of Jefferson lab:
  - Shaping scientific discussions
  - Informing current and future hardware acquisitions to facilities science
  - Software discussions for science productivity and capability
- Lattice QCD and USQCD have had, and will continue to have a strong influence on the Physics program at Jefferson Lab and are a central to maximizing the productivity and impact
Jefferson Lab @ 12 GeV Science Questions

• What is the role of gluonic excitations in the spectroscopy of light mesons?

• Where is the missing spin in the nucleon? Role of orbital angular momentum?

• Can we reveal a novel landscape of nucleon substructure through 3D imaging at the femtometer scale?

• Can we discover evidence for physics beyond the standard model of particle physics?
CEBAF Upgrade

- Add 5 cryomodules
- 20 cryomodules
- Add arc
- CHL-2
- New Hall
- Add 5 cryomodules

Cryomodules A, B, C
12 GeV Upgrade Project

TPC = $338M
ETC < $2M

Project Scope (~99.7% complete):
- Doubling the accelerator beam energy – DONE
- New experimental Hall D and beam line – DONE
- Civil construction including utilities – DONE
- Upgrade to Experimental Hall C – DONE
- Upgrade to Experimental Hall B – 99%
- Solenoid only scope remaining
Physics Operation with 12 GeV Facility

• **Quark confinement:** Hall D (GlueX) engineering and 1st physics run completed
  – Basis for more than a dozen papers at APS DNP (Oct 2016)
  – 50 Billion events in Spring 2017

• **Nucleon structure:** Hall A started physics operations
  – Two experiments: G_{M^p} and DVCS in Fall 2016
  – One Experiment, Argon Spectral Function complete, Spring 2017

• **Dark matter:** Hall B Heavy Photon Search engineering run
  – Results of 2015 data-taking expected soon

• **Proton Radius:** Hall B PRad experiment physics run
  – Experiment run and completed Summer 2016

Starting to exploit the Upgrade for Physics
Welcome!