

The background is a dark blue space filled with small white stars. A central cluster of approximately 12 green, semi-transparent spheres is the focal point. These spheres are arranged in a roughly spherical pattern. Surrounding this cluster are several glowing lines: some are bright green and form a complex web of intersecting paths, while others are a lighter blue and form larger, more circular orbits. A few small blue spheres are also visible on these paths, suggesting a network or orbital system.

Welcome to PN12

The 12 GeV Upgrade to Jefferson Lab

- CD0/4
- Prioritized scientific program in pCDR:
 - Gluonic excitations and the origin of quark confinement (exotic hybrid mesons)
 - The fundamental structure of the nucleon (form factors, valence quark structure, and generalized parton distributions)
 - The physics of nuclei (N-N short range interaction, hadron-quark transition)
 - Symmetry tests
- *N-N short range interaction*: Color transparency, threshold J/Ψ -N, quark propagation, short-range correlations
- *Hadron-quark transition*: scaling, helicity conservation, charged pion form factor, pion photoproduction

Goals of the Workshop

- To identify new directions for the 12 GeV upgrade
- To refine existing upgrade initiatives
- To welcome new researchers to the JLab community, and identify connections between the JLab program and initiatives at other laboratories, both at lower and higher energies
- To define coherent themes of the nuclear physics JLab addresses

Crucially important to take a broad view of the field as a whole

Structure of the Workshop

Four major sessions:

- Quarks and Gluons in the Nuclear Medium
- The QCD View of the Nucleus
- The Hadronic View of the Nucleus
- The Nature of Hadron-Hadron Interactions

For each talk, can ask:

- What are the essential, compelling Questions?
- What are the Coherent themes into which it fits?
- What are the Discovery class experiments we could do?

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D

Outcomes of the Workshop

- White paper
 - To define the compelling questions, coherent themes, and discovery potential experiments related to the workshop
 - Initial outline by convenors, Thursday evening
 - Presentation and extended discussions on Friday
 - Initial refinements through November
 - In principle, could alter existing prioritization of 12 GeV scientific program
- A vision for a coherent, world-class program for studies with nuclei, at JLab and elsewhere, addressing new, fresh, interesting questions
- The beginnings of a new community

Mysteries of Nuclei, Old and New

- Yukawa or not?
- The virtual photon knows
- Energetic quarks and invisible nuclei
- That elusive color transparency
- Subtle changes for hadrons in groups
- Sociology of quark systems in pairs

Practicalities

- Speakers: please give your talks to Stepan Stepanyan
 - Email to stepanya@jlab.org or give him a copy on other media
 - Plastic transparencies will be scanned and returned
- Conference computers
- Conference wireless network