Time Line

June 1994	Workshop on CEBAF at Higher Energies
June 1998	Physics and Instrumentation with 6 - 12 GeV Beams
January 2000	Workshop on Physics Opportunities with 12-GeV Electrons *Emphasis on Identification of Key Experiments that drive the JLab 12 GeV Upgrade*
January 2000 - June 2000	Mini-Workshops *Emphasis on Development of Physics and Instrumentation Proposals to Drive the JLab 12 GeV Upgrade*
June 2000 21-23	JLab Users Meeting *Presentation of Physics and Instrumentation Proposals*

5 MONTHS ONLY!

The final proposals are expected to be concrete, with projected uncertainties based upon design characteristics of planned accelerator and equipment. Such proposals will be presented at the June 2000 JLab Users Meeting, and are intended to be part of the Conceptual Design Report for JLab's 12 GeV Energy Upgrade program.

June 21-23 "Proposal" Defense
Physics + Equipment (+ Hall D)

no friendly PAC .... but

cantankerous skeptical community ....
Many-Body Physics!!

charm : Phenomenology certainly new, i.e.
it doesn't exist.
a good experiment for theorists....

Nuclei : Speaking as someone who finds the
deuteron already big enough!
Need F_2^n as well as F_2^p
A_1^n : I'll even go as far as ^3He ...

SPD : Theorists are good at finding fancy
phrases to cover their ignorance!
superfast quarks
quark-gluon structure of SRC

Better to do a few things well than many
things badly

– Exclusive Reactions and (SPD)

attach of the SPD !!

Strategy ??

Deep Structure of Baryons

- High Q^2 } RCS, DVCS, $(\gamma^{(*)}, e)$,
- High t } FF's $(p, n, \Delta, \ldots)$
"Program"

Meson Structure

- FF π FF ?
- π°, η, η' decay widths η, η'

4   4 Subgroups ?

– Threshold Charm Production

Argument : Crossing Threshold (analogy?)

$d\sigma/dt (E_\gamma)$

Spin-off $d\sigma/dt (A)$ QCD van der Waals
Heavy Ion

– Hadrons in the Nuclear Medium

Deuteron $\equiv$ Nucleus

2   Color Transparency   (no analogy for 3q system)

$A(e,e'p)$ @ High Q^2
$D(e,e'p)$ @ High Q^2, p_m

2   Quark Gluon Structure of SRC
$D(e,e'$ backward p) $(0.1 < p < 1\ GeV/c)$
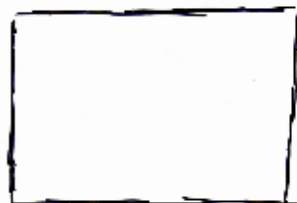$A(e,e')$ $x > 1$ High Q^2 (superfast quarks)
$\rightsquigarrow F_2^n$, EMC effect

Parton - Hadron Duality

Need to be able to explain importance to layman !

But powerful tool ....

insert picture here!

- Inclusive Structure Functions (F_2, F_L, g, g_2)
- Duality in Semi-Inclusive Structure Functions
  $(e, e'm)$

Valence Quark Structure

- A_1^n @ large x
- d/u from $^3He/^3H$

  Benefits greatly from Duality

  Higher Twist ? (q-q correlations, or ?)

  ( ) - g_2
  ( ) - H, D $(\vec{e}, e')$ PV @ large x
       ↳ d/u Specialized Device ??   ~30 msr

  ⟶ JD signoff

$(\geq 13) \longrightarrow \leq (6)$?

- Equipment (SHMS, Hall B upgrade, ...)
  additional / other equipment $^3H, ...$
- Hall D