

Presenting the EIC nucleon structure program

C. Weiss, Informal comments, 13-Aug-14

- **Focus on dynamical system, not formal descriptors**

Nuclear physics: “the nucleus.” Astrophysics: “the universe.” Condensed matter. . .

GPDs, TMDs, Wigner fns are tools, not ends. No intuition/interest in broader community.

Talk about “the nucleon in QCD” using physical concepts: Particle content, spatial extent, orbital motion, response to polarization, forces and fields, correlations

- **Use language of wave function**

Intuition for first quantization \gg second quantization in broader community

Relativistic system: Particle number not conserved. *This should be fascinating!*

Can be done: Light-front view, parton picture. Popular presentation needs work.

GPDs/TMDs as density/projection of “wave function.” Can be done responsibly, scale μ

Wave function language used already in saturation/CGC — unified description

- **Take nonperturbative dynamics seriously**

It is the ultimate reason why we do the experiments!

Intellectual gain is in *physical picture*. Idealization – simple but not naive

Role of Lattice QCD limited: Can it *explain* results?

Deep-Minkowskian structures very challenging.

Avoid naive statements!

Systematic/parametric approaches to non-perturbative structure have much to offer:
Chiral dynamics, large- N_c , vacuum structure expansions (QCD sum rules etc.)

Dynamical models should be described in physical terms: Effective degrees of freedom, fixed number of constituents, independent particle motion, . . .

It's not just "lattice" and "models." Need realistic, nuanced assessment!

Physical picture!