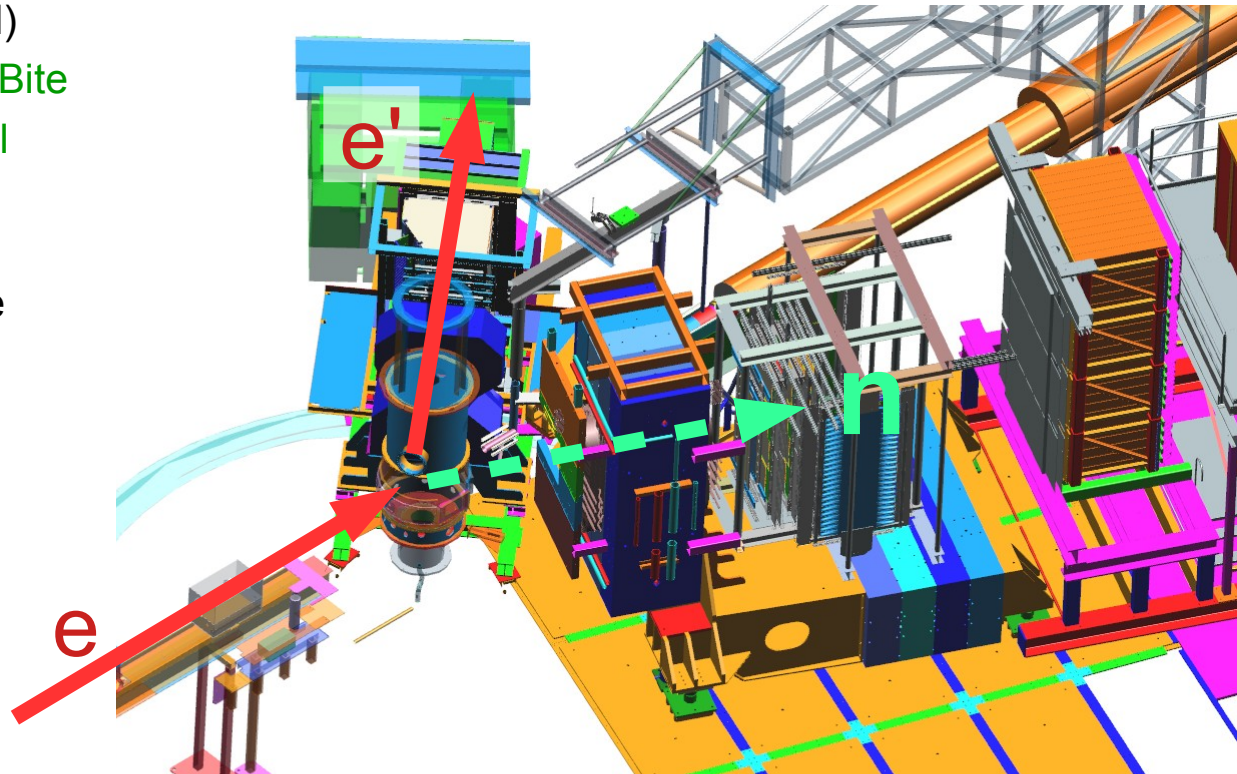


# GEN-RP Physics / Experimental Approach

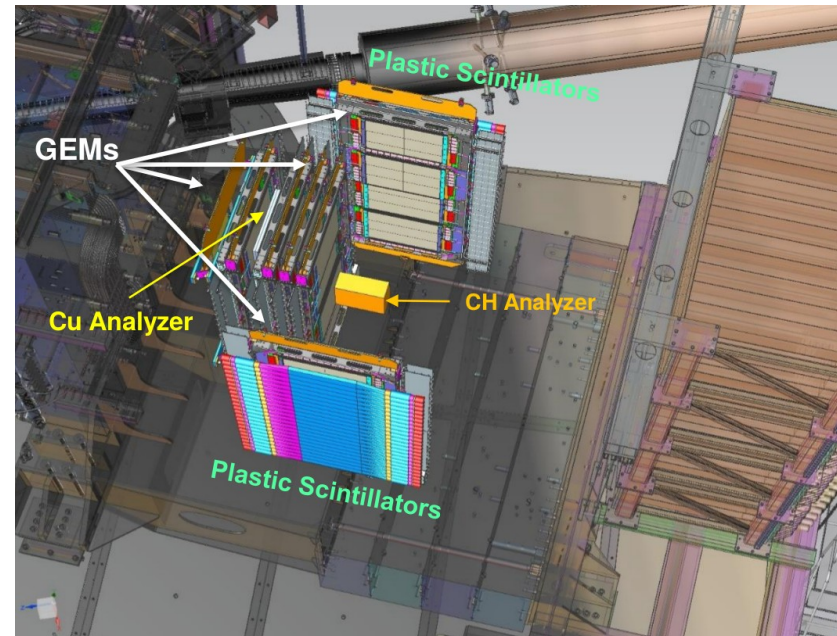
- E12-17-004 will measure GEn/GMn using two recoil pol. techniques
  - “GMn” beam, beamline, target, BB
    - » Beam: 4.4 GeV/c,  $\sim 40 \mu\text{A}$ ,  $P_b = \sim 80\%$
    - » Target: 15 cm LD2 (unpolarized)
  - Scattered electron measured in BigBite
  - Charge-Exchange np  $\rightarrow$  pn channel (primary goal)
    - » Steel analyzer (passive)
    - » GEM tracking + HCAL measure forward protons
  - Conventional np  $\rightarrow$  np (secondary goal)
    - » Plastic analyzer (active)
    - » Large-angle recoil protons  $\rightarrow$  Side detectors (GEM + hodoscope)
    - » Forward neutron  $\rightarrow$  HCAL

- Detector components also used in:
  - Wide-angle Charged Photoproduction (WAPP)
    - » SBS Inline GEM stack + Steel analyzer



# Addl. Hardware for GEn-RP / E12-17-004

- Active Analyzer (PR)
  - segmented plastic scint. array
  - np recoil vertex identification
- Recoil proton detectors (PR)
  - 2 packages total:
    - » One on SBS Left
    - » One on SBS Right
  - Each package contains
    - » 1x Hodoscope array
      - timing, coarse location
    - » 2x UVa GEM planes
      - Tracking protons from CH analyzer
- Inline GEMs (PR + ChEx)
  - 2x INFN + 6x UVa GEMs
  - Charged particle veto (both)
  - forward proton tracking (ChEx)
- Steel Analyzer (ChEx)



# High Level Tasks / Todo List (Non-GEM)

- Near Term tasks w/ ESB DAQ testbed (ASAP: Summer/Fall)
  - PR Hodoscope Bars (80% done)
    - » Finish regluing broken joints
    - » Complete checkout and gain matching
  - Active Analyzer
    - » Recheck functionality
    - » Gain match w/ cosmics
  - Sort and re-label cables
- SBS fringe field test with PMTs (Fall?)
  - Validate B-shielding options with actual PMTs using HH coil PMT test stand in TestLab
- Longer Term (Spring/Summer)
  - Install/Mount hodoscopes in new stands (when available)
    - » Re-check all bars w/ cosmics
  - Integrate UVa GEMs into PR sub-assemblies as soon as possible
  - Software work (Analyzer)
    - » Add GEN-RP PMT arrays to PODD (easy)
    - » Add SBS GEM tracking to PODD (harder)

## Local support: Brad, Holly

- Original CNU and Summer Student plans were squashed by COVID, but great student projects here!