NPS project and future plans for EIC

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for the NPS Collaboration at Jefferson Lab

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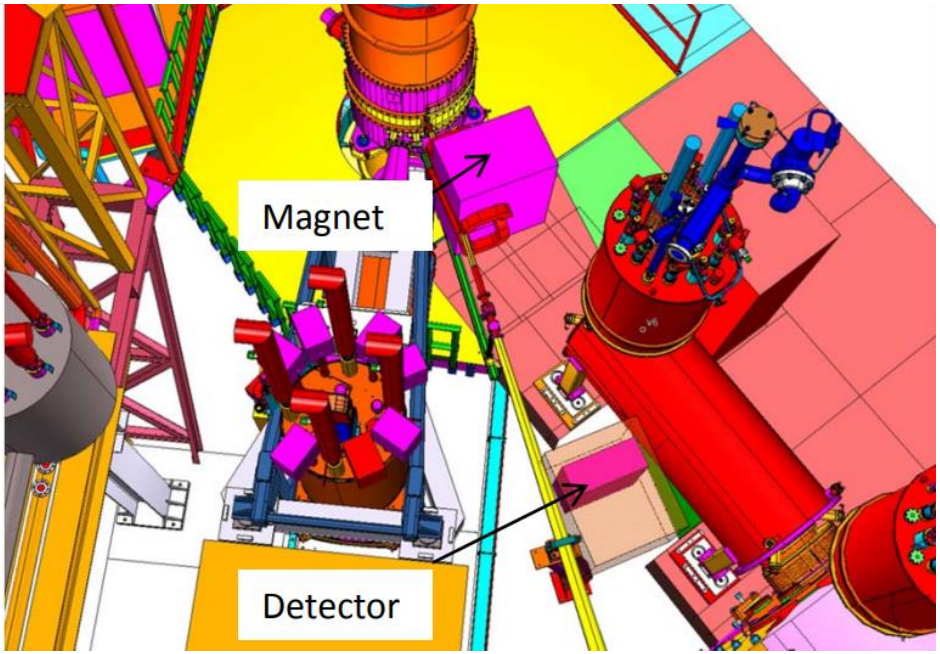
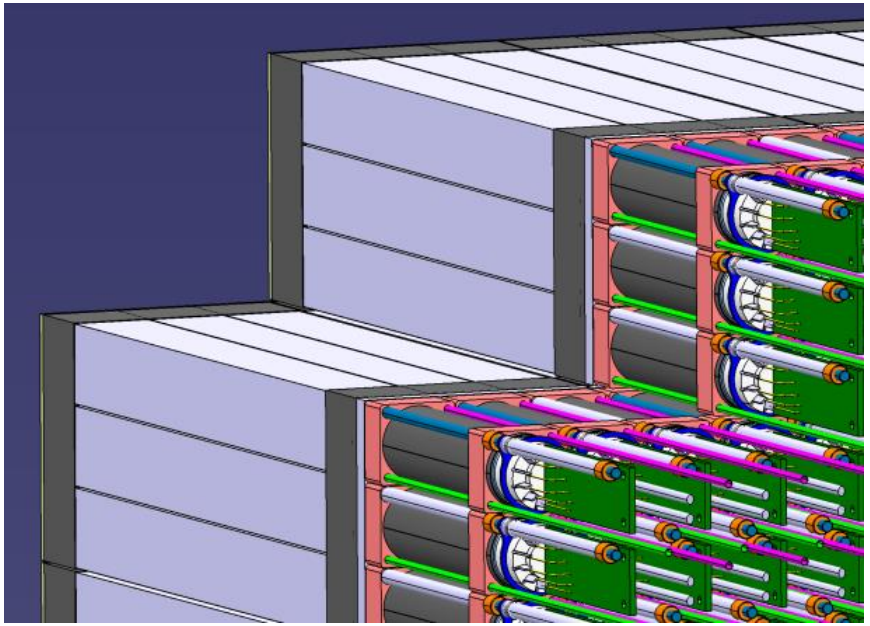
NPS project at JLab

- Fully funded project
- Several experiments approved
- First experiment could run as soon as 2021-22

Experimental setup:

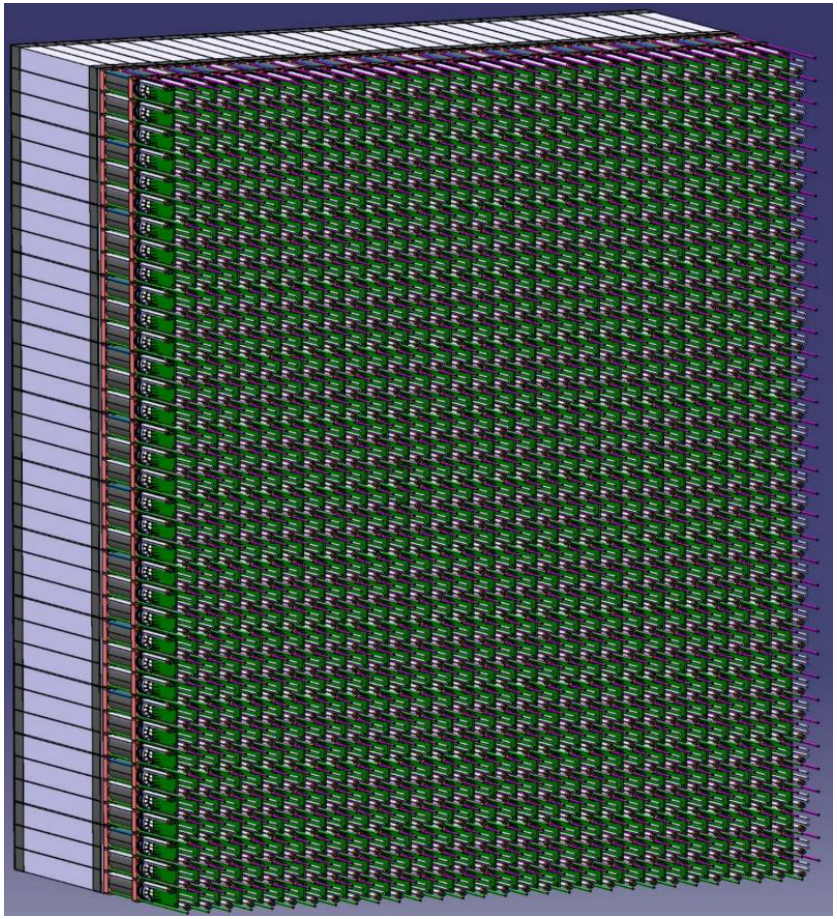




Design based on 2x2x20 cm PWO crystals optically coupled to PMTs

NPS calorimeter

A total of 36x30=
1080 PWO crystals needed



36 rows

36 columns

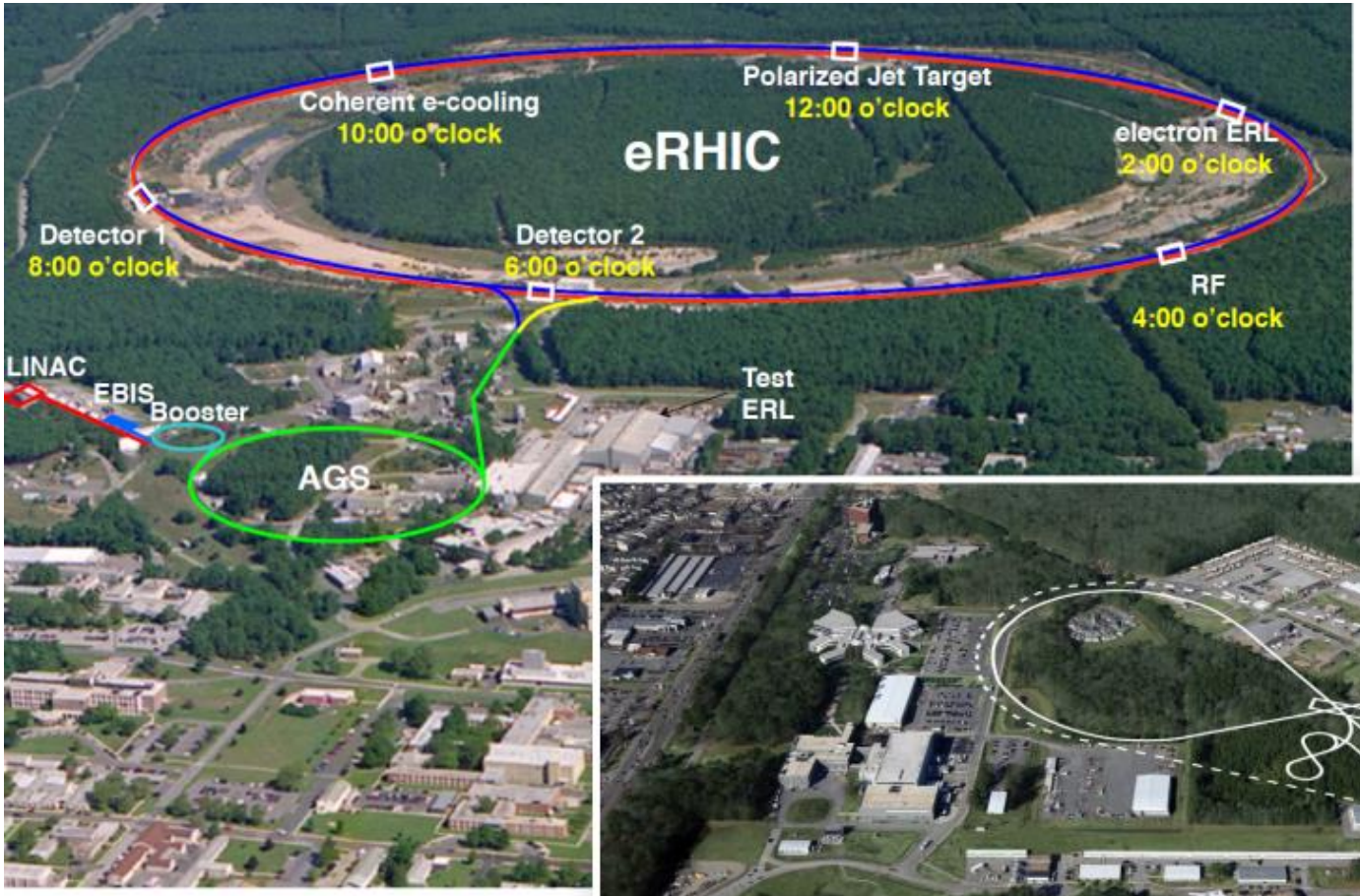
Critical requirements of the detector:

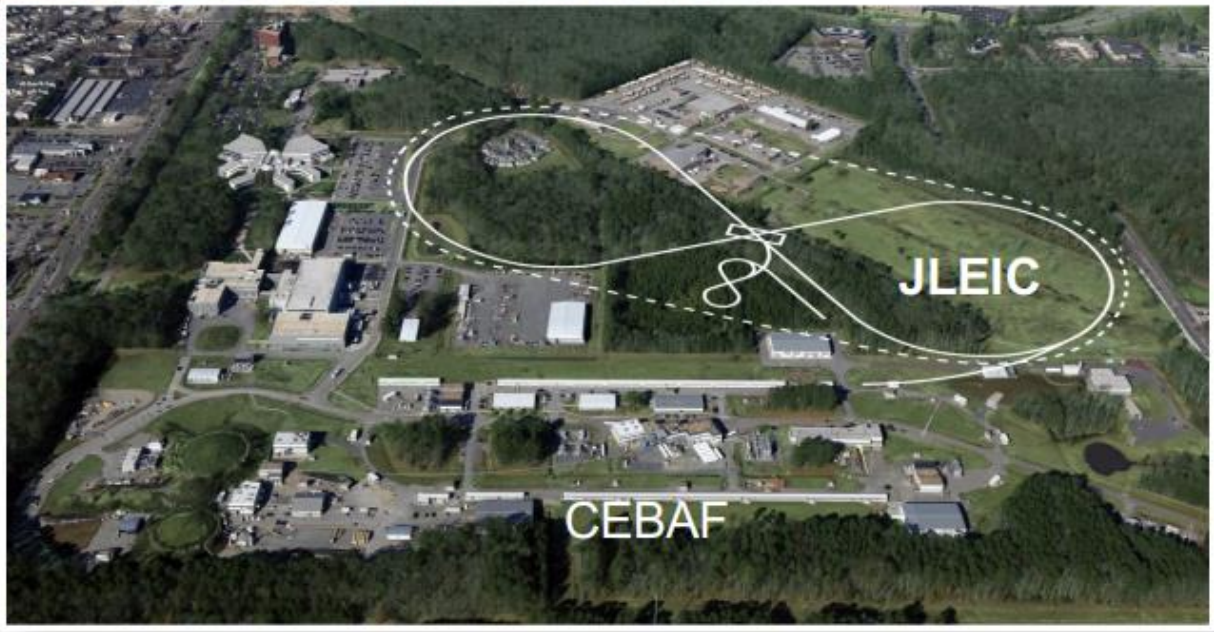
- ✓ Energy resolution (light yield)
- ✓ Radiation hardness
- ✓ Uniformity:
  - Crystal to crystal
  - Along each individual crystal

Timeline to procure all crystals:
end 2019

Longer term project: calorimeter for the US Electron Ion Collider

2 alternative designs: one at BNL (New York) and one at Jlab (Virginia)



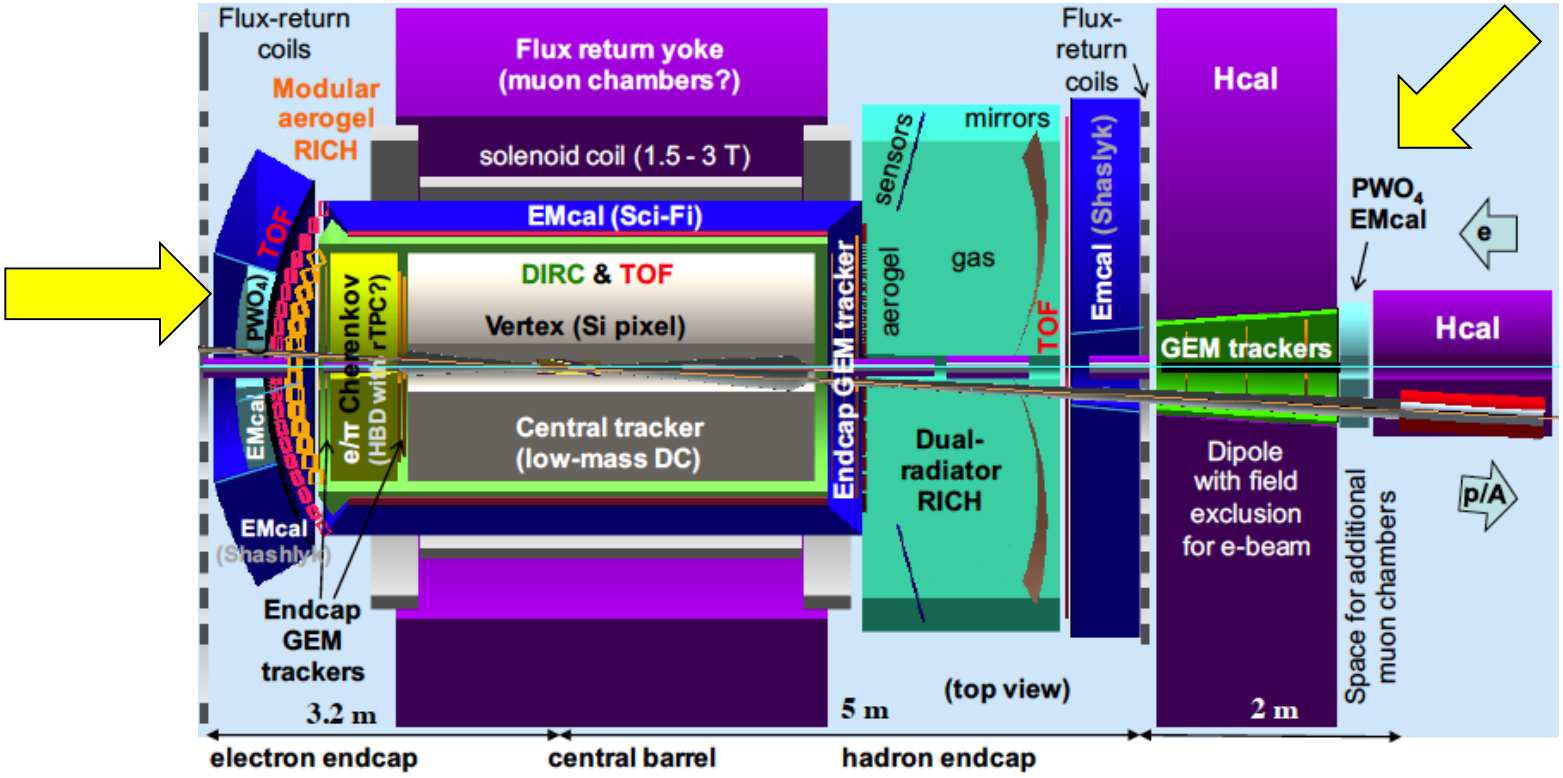


Calorimetry for the Electron Ion Collider

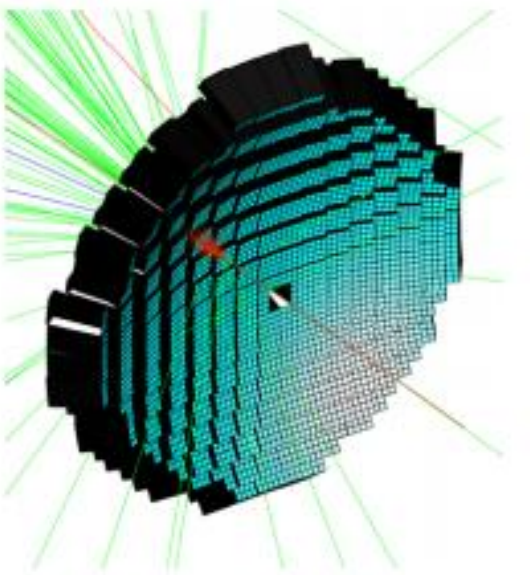
- **PID requirements in the electron endcap** primarily driven by nearly real photo-production and semi-inclusive and exclusive processes
- **PID requirements in the ion endcap** primarily driven by exclusive processes, e.g., DVCS (γ vs. photons from π^0 decay) and to detect excitation in recoil baryons

Detection at very small angle is needed

Example: JLEIC detector



Tentative plans concerning PWO in EIC



- Design still under study
- Several thousands PWO crystals may be required
- Specifications will be similar, but not exactly the same as for previous projects (still under study)

Tentative timeline:

- Detector R&D ongoing
- Accelerator and detectors construction 2020-2025+