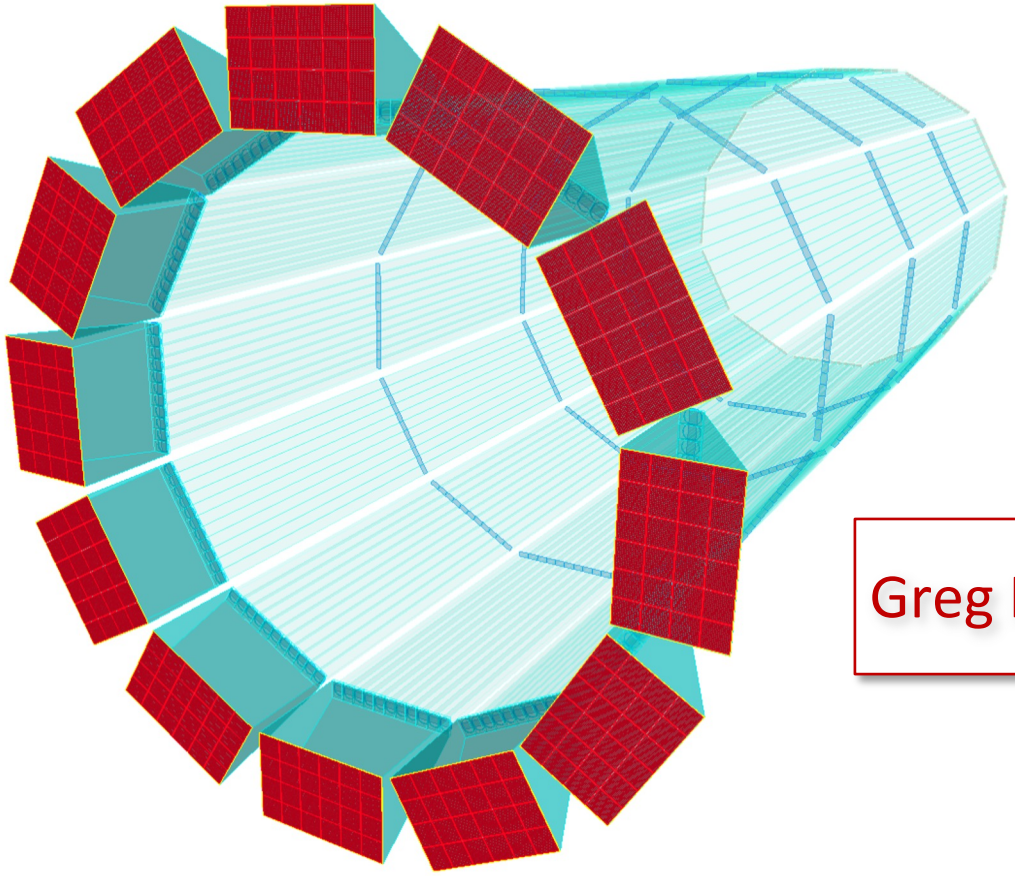
ePIC hpDIRC



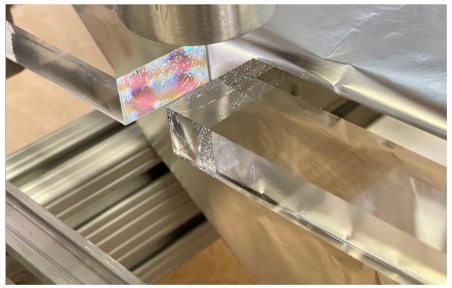
Greg Kalicy

CUA

HPDIRC STATUS

- Validation of the BaBar DIRC bar reuse:
  - Bar box aluminum shell disassembled without cutting
  - Four short bars successfully separated from one long bar using heat guns
  - Glue residue removal and bar cleaning in progress
  - Bar quality assessment in laser setup next

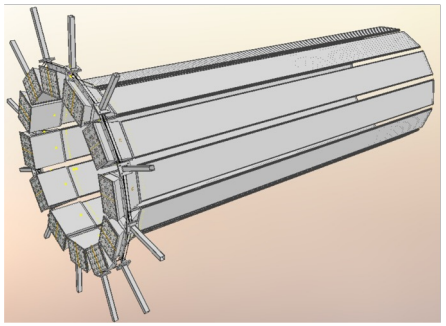
Disassembly setup at JLab

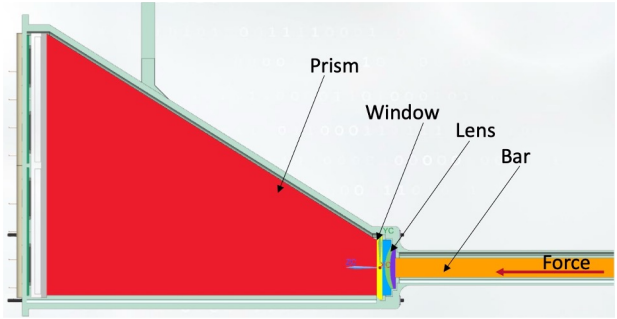


QA lab at JLab

- Ongoing hpDIRC studies in simulation:
  - Sensor coverage, bar width, lightguide width
  - Implementing full reconstruction into ePIC software stack

hpDIRC in CAD





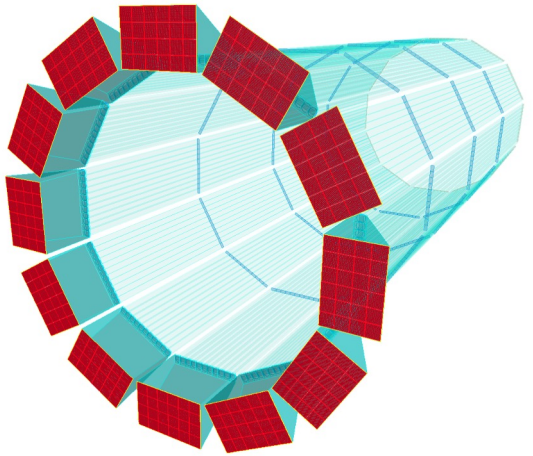
- Mechanical Design and Integration:
  - Progressing with design of bar boxes, readout boxes, support structure
- hpDIRC prototype in Cosmic Ray Telescope (CRT) at SBU:
  - Integration of DAQ systems in progress, goal is to start CRT commissioning in March

hpDIRC prototype at SBU

Key Challenges

- **Photosensors:**
  - hpDIRC sensor technology decision requires detailed tests, side-by-side HRPPD/MCP-PMT comparison
  - hpDIRC issues: Timing and high occupancy (ringing)
  - Significant delays during Photek fabrication and commissioning of setup in Glasgow
- **Readout electronics:**
  - ASIC needs to be validated with HRPPD/MCP-PMT
  - Availability of prototype ASIC (2028+) a major concern
- **Tracking resolution:**
  - hpDIRC design choices impacted by tracking resolution
  - Significant progress from tracking studies in 2024/2025 but current and achievable resolution values still unclear

hpDIRC with commercial MCP-PMTs



hpDIRC with HRPPDs