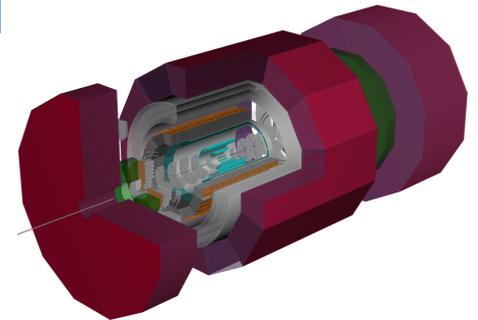


# ATHENA PROPOSAL OUTLINE DRAFT.....



ABHAY DESHPANDE, BARBARA JACAK, PETER JONES, ZEIN-EDDINE MEZIANI



# INSTRUCTIONS FROM THE CALL FOR COLLABORATION PROPOSALS

## Things to keep in mind

The Proposals should include two parts:

- A description of the science addressed and performance estimated through simulation including, but not limited to,  $e/\gamma$ , jets,  $\pi/K/p$  separation, vertex, and tracking, and how the simulated performance compares to the requirements detailed in the YR. The realization of the conceptual detector design given the technology choices, the R&D needs, risks, and, if applicable, adoption technologies.
- A collaboration roster and structure, time scale and cost (including potential sources of funding and assumptions), and potential upgrade paths.
- If possible, the proposal should not exceed 60 pages, 40 pages for the first part and 20 pages for the second.

# OUTLINE

## Chapter I

- Introduction
  - Science questions (narrative) with a summary table for quick mapping of the detector performance to the golden channels.

Science questions?	“Adjective”Channels	Critical Detector Subsystem ( performance criterion YR vs ATHENA opt)	ATHENA subsystem performance with ATHENA Tech. choice (Fig. # )	ATHENA full Detector Performance for golden channel (Fig. #)
Origin of mass				
Origin of spin/3D-transverse imaging <ul style="list-style-type: none"> <li>• Position</li> <li>• Momentum</li> </ul>				
Ultra-dense gluonic matter				
Hadronization-Jets				

## OUTLINE (CONTINUED)

### Narrative on the experimental “adjective” channels & requirements

- Experimental “adjective” channels:
  - In inclusive; ep-- (gluons: mass and spin), eA (ultra-dense gluons)
  - In semi-inclusive;
    - ep-- (spin, 3D transverse momentum imaging of quarks[through hadrons] and gluons[through jets])
    - eA --hadron(s)/jet formation and propagation through nuclear matter (with hadrons and jets of hadrons)
  - In exclusive; ep (mass, 3D transverse gluons/quarks position imaging) and eA (gluon/quarks 3D transverse imaging, medium effects, ultra-dense gluonic matter)
- End-to-end simulations of one “chosen” channel per each NAS report science question showcasing the performance of the whole detector as examples. A more in depth discussion in Chapter II).
- Discuss a preamble to the detector challenges before entering Chapter II, especially those not identified in the YR.

# OUTLINE (CONTINUED)

## Chapter II. The ATHENA DETECTOR CONCEPT

- The ATHENA detector concept
  - Overall detector and each subsystem description with technology choices
  - Performance of each subsystem and of the whole detector
  - Mapping to the detection challenges described in Chapter I.
  - Impact on the golden channels with end-to-end simulations (figures not presented in Chapter I)
  - Highlight novel technologies when required and discuss the R&D and risk
- Far-forward detection in concert with central detector
  - Protons
  - Neutrons
  - Recoil nuclei (intact or broken)
- Polarimetry? Common to both ATHENA & ECCE

# OUTLINE (CONTINUED)

## Chapter III

- A collaboration roster and structure,
- Time scale and
- Cost (including potential sources of funding and assumptions),
- Potential upgrade paths.

# NEXT STEPS

## Physics WGs and Detector WGs input to CHAPTER I, II

- Continue developing the outline and iterating with the WGs
- Flesh out the golden channels with a clear map to the science questions of WP and NAS report. Will need one or two science <--> detector maps for clarity.
- Identify and confirm the physics validation and detector performance plots

## Integration and Costing Committee input to Chapter II, III

**THANK YOU!**  
**QUESTIONS?**



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