



LCG meeting, April 17th 2024



Proton and nuclear structure from EIC to LHeC and FCC-eh

Néstor Armesto (Santiago de Compostela), Claire Gwenlan (Oxford) and Paul Newman (Birmingham)

Themes

The ep/eA study at the LHC and FCC – new impactful goals for the community

2023

WS

2024

WS

2025

TWS

input to ESPP

proton and nuclear structure from EIC and HERA to LHeC and FCC-eh

novel QCD with high-energy DIS physics: what do we discover when breaking protons and nuclear matter in smaller pieces

general-purpose high-energy physics programme: precision physics and searches

enabling direct discoveries and measurements in EW, Higgs and top physics with high-energy DIS collisions

ep/eA-physics empowering pp/pA/AA-physics (LHC and FCC)

improving the ATLAS, CMS, LHCb and ALICE discovery potential with results from a high-energy DIS physics programme

developing a general-purpose ep/eA detector for LHeC and FCC-eh

critical detector R&D (DRD collaborations), integrate in the FCC framework, one detector for joint ep/pp/eA/pA/AA physics

developing a sustainable LHeC and FCC-eh collider programme

design the interaction region, power and cost, coherent collider parameters & run plan, beam optimization, ...

- typically 2-3 conveners per theme

- annual ep/eA workshops (WS)

- final thematic workshop with closing reports to inform the upcoming Strategy process with impactful information (TWS)

- inform the community with regular ep/eA Newsletters

- everybody is welcome to join

Coordination Panel: N. Armesto, M. Boonekamp, O. Brüning, D. Britzger, J. D'Hondt (spokesperson), M. D'Onofrio, C. Gwenlan, U. Klein, P. Newman, Y. Papaphilippou, C. Schwanenberger, Y. Yamazaki

Themes

The ep/eA study at the LHC and FCC

ambitious goals for the community

community

2023

WS

2024

TWS

input to ESPP

proton and nuclear structure from EIC and HERA to LHeC

novel QCD with high-energy DIS physics: what do we discover when break matter in smaller pieces

general-purpose high-energy physics programme: precision physics

enabling direct discoveries and measurements in EW, Higgs and top physics

ep/eA-physics empowering pp/pA/AA-physics (LHC and FCC)

improving the ATLAS, CMS, LHCb and ALICE discovery potential with results from ep/eA physics programme

developing a general-purpose ep/eA detector for LHeC and FCC

critical detector R&D (DRD collaborations), integrate in the FCC framework for pp/pA/AA physics

developing a sustainable LHeC and FCC-eh collider programme

design the interaction region, power and cost, coherent collider parameterization, ...

- typically 2-3 conveners per theme

- annual ep/eA workshops (WS)

- final thematic workshop with closing reports to inform the upcoming Strategy process with impactful information (TWS)

- inform the community with regular ep/eA Newsletters

- everybody is welcome to join

- typically 2-3 conveners per theme

- annual ep/eA workshops (WS)

- final thematic workshop with closing reports to inform the upcoming Strategy process with impactful information (TWS)

- inform the community with regular ep/eA Newsletters

- everybody is welcome to join

Coordination Panel: N. Armesto, M. Boonekamp, O. Brüning, J. D'Hondt (spokesperson), M. D'Onofrio, C. Gwenlan, U. Klein, P. Newman, Y. Pawanenberger, Y. Yamazaki

M. D'Onofrio,

Three items for the WS:

From more to less probable:

- PDF and alphas for the combination HERA+EIC+LHeC+FCCeh.
Katarzyna Wichmann (CMS and ZEUS, DESY, contacted) and Tom Cridge (MSHT, DESY).
- SMEFT fits of DIS+hh to resolve degeneracies and clarify how much new physics can be hidden in PDFs and how much DIS can help.
Maria Ubiali (NNPDF, Cambridge), Juan Rojo (NNPDF, VU Amsterdam, showed interest) and, maybe, some persons in the US (<https://arxiv.org/abs/2306.05564>).
- Saturation and resummation beyond inclusive observables in DIS.
Heikki Mantysari (Jyväskylä, informally approached).