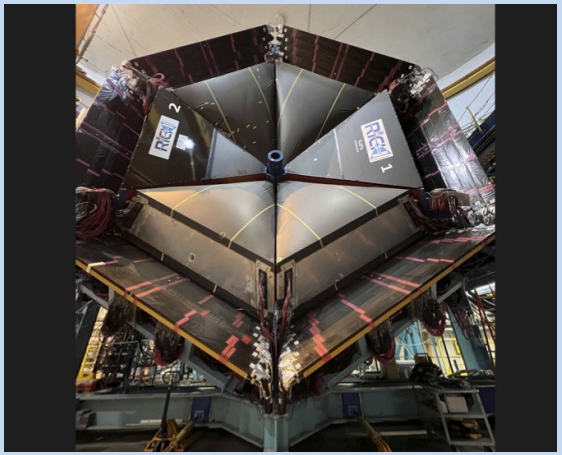
Incontro preventivi JLab12-Italia 21 luglio 2022

Aula Daniel Bovet, Istituto Superiore di Sanita', Roma

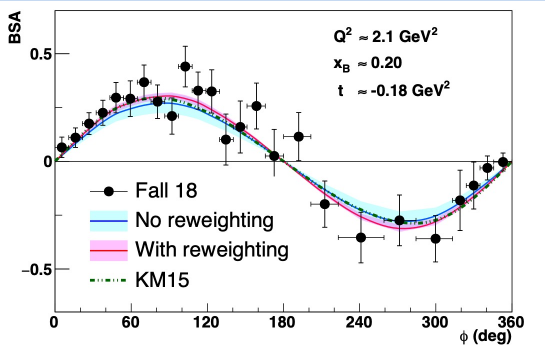
JLab Highlights

Hall-B: RICH installation completed
First run with a polarized target
Hall-A: Fully operational SBS spectrometer



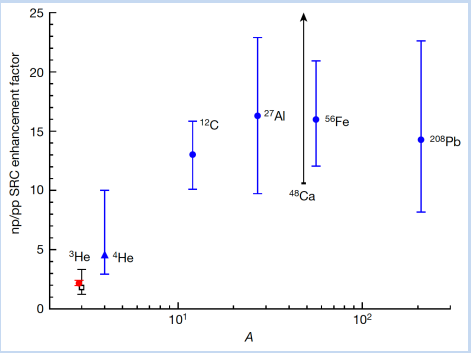
CLAS12: PRL 130 (2023) 21, 211902
First CLAS12 Measurement of DVCS Beam-Spin Asymmetries in the Extended Valence Region

The first CLAS12 measurement of the DVCS beam-spin asymmetry off unpolarized proton targets, greatly extends the x and Q^2 phase space beyond the existing data in the valence region with unprecedented statistical precision.



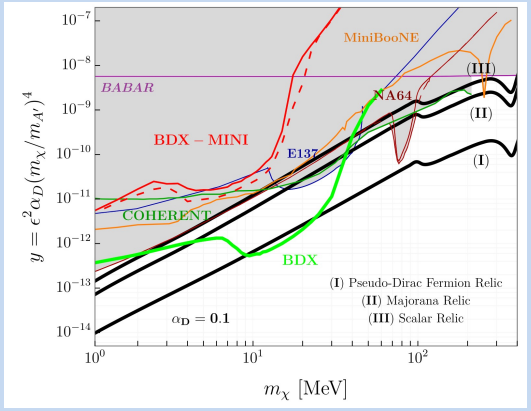
Hall-A: Nature 609 (2022) 41-46
Revealing short-range structure of the mirror nuclei ^{3}H and ^{3}He

Hall-A measurement of np/pp short-range corelation ratio in mirror nuclei ^{3}H and ^{3}He is an order of magnitude more precise than previous experiments, and finds a marked deviation from the near-total np dominance observed in heavy nuclei.



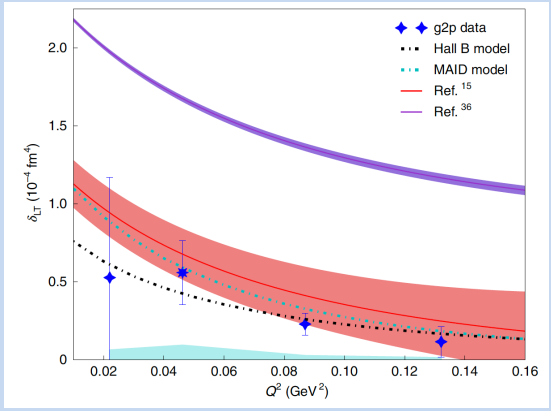
Dark matter: PRD *106 (2022) 072011*
Dark matter search with DBX-mini experiment

The BDX-mini pilot experiment probed to be sensitive to the parameter space covered by some of the most sensitive experiments to date, and demonstrates the discovery potential of the next generation beam dump experiment planned at intense electron beam facilities.



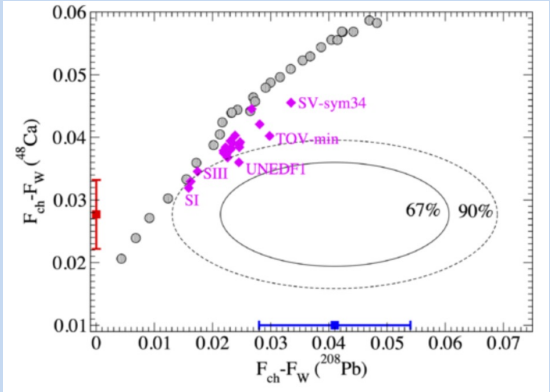
Hall-A: Nature Phys. 18 (2022) 1441-1446
Proton spin structure and generalized polarizabilities in the strong QCD regime

Hall-A measurement of the spin structure function g2 accesses generalized polarizabilities that are fundamental quantities describing the nucleon's response to an external field, and benchmarks the Chiral perturbation theory predictions.

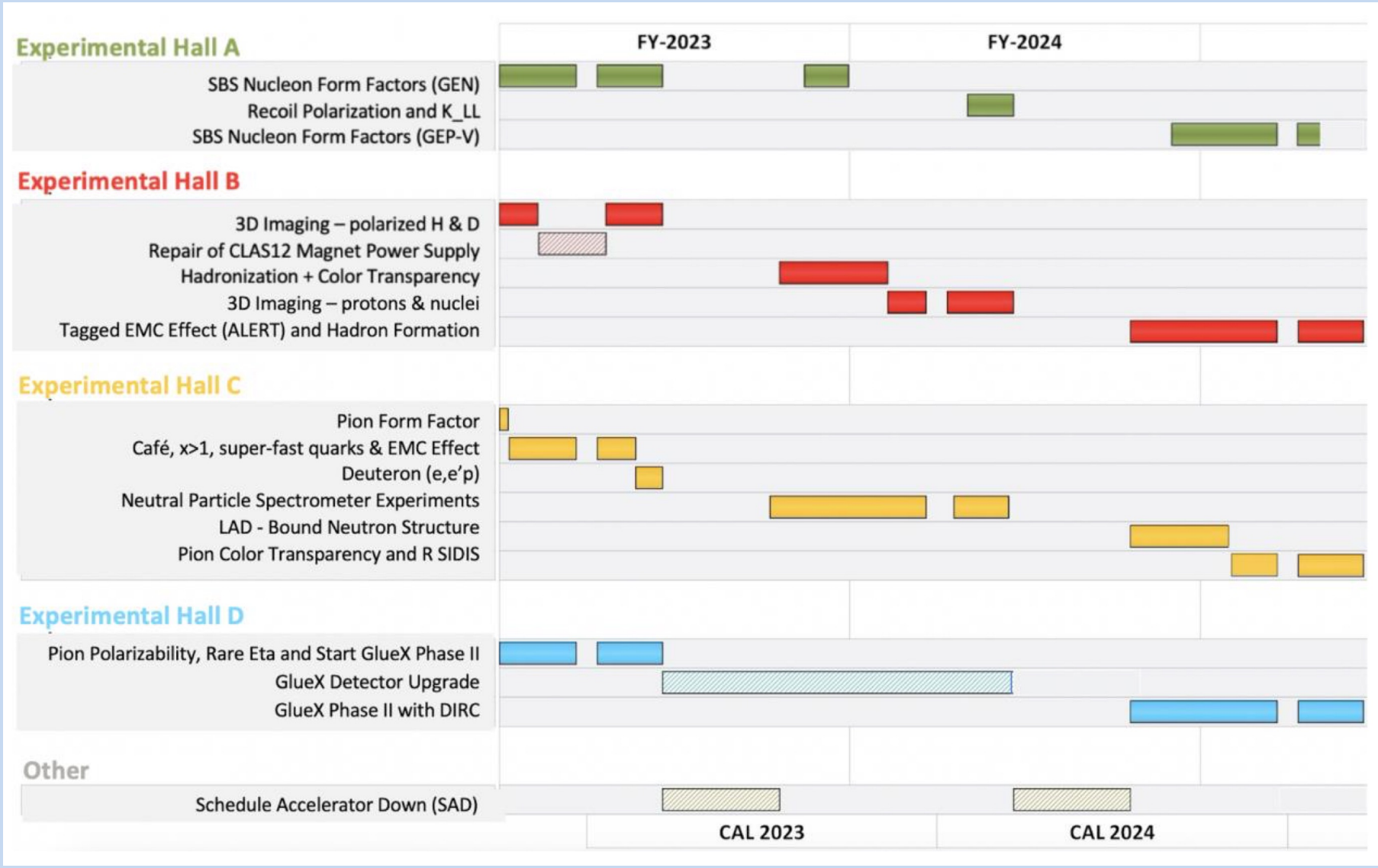


CREX: PRL 129 (2022) 042501
Precise determination of the neutral weak form factor of ^{48}Ca.

CREX has performed a precise determination of the neutron skin thickness of the ^{48}Ca nucleus. Together with the PREX measurement on ^{208}Pb, it provides constraints on the density dependence of the symmetry energy of nuclear matter.

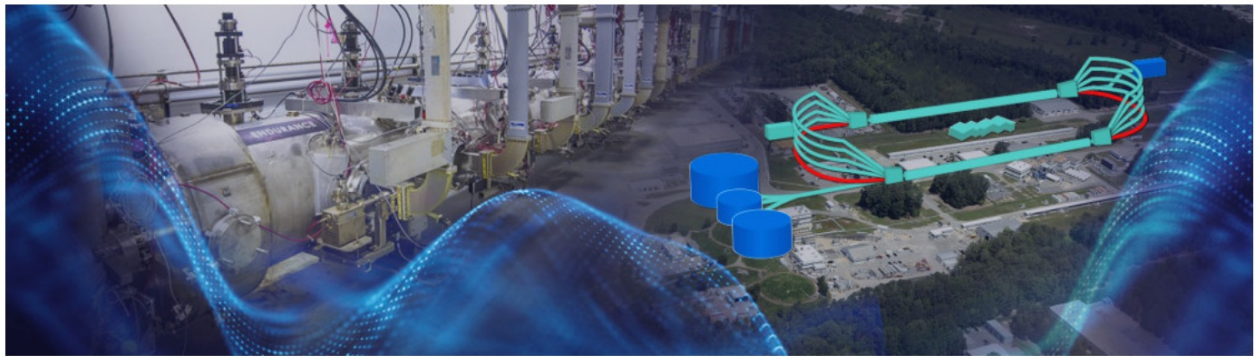


CEBAF Schedule



SCIENCE AT THE LUMINOSITY FRONTIER: JEFFERSON LAB AT 22 GEV WORKSHOP

January 2023



Strong Interaction Physics at the Luminosity Frontier with 22 GeV Electrons at Jefferson Lab

arXiv: 2306.09360

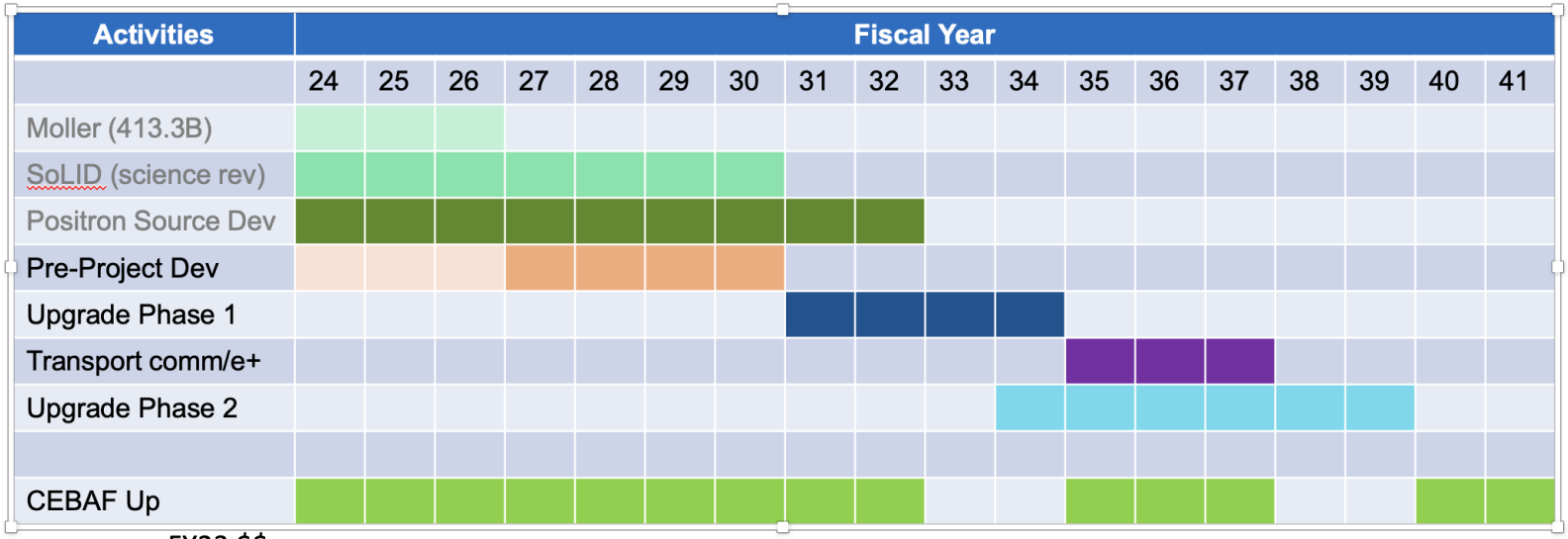
Long Range Plan (fall 2023):

Priority: Complete approved program at Jefferson Lab (included SOLID)

Initiative: Preparatory work for the 22 GeV upgrade

NOTIONAL CEBAF & UPGRADE SCHEDULE (FY24 – FY42)

- Accelerator team has worked up an early schedule and cost estimate
  - Schedule assumptions based on a notional timing of when funds might be available (near EIC ramp down based on EIC V3 profile)
  - For completeness, Moller and SoLID (part of 12 GeV program) are shown; positron source dev shown



- FY23 $$
- Phase 1: tie LERF to CEBAF & injector for e+ — $101M ($78M – $152M)
- Phase 2: High Energy Upgrade (includes FFAs) — $244M ($188M – $366M)
- Total cost (Class 4 estimate) — $345M ($265M – $517M)

Alessandra Filippi is member of the HPS Executive Committee (since May 2023)
is Chairperson of the HPS Publication Committee

Andrea Celentano is member of the HPS Publication Committee (since May 2023)

Marco Contalbrigo is Chair of the JLab User Organization (since June 23)

Patrizia Rossi is deputy Associated Director

Lucilla Lanza is member of the CLAS Speaker Committee

Marco Mirazita is member of the CLAS Service Work Committee

Evaristo Cisbani is member of the SBS Coordinating Committee.

Raffaella de Vita is CLAS12 Software Coordinator and
member of the CLAS Coordination Committee

FTE: stable number (around 28) in the past 4 years

PhD students:

Antonino Fulci	CT
Stefano Grazzi	GE
Antonio Riggio	CT
Elena Sidoretti	RM2
Marco Spreafico	GE
Simone Vallarino	FE
Tomaso Vittorini	GE

Funding Plan

(All but ME)	2020 Assigned	2021 Assigned	2022 Assigned	2023 Assigned	2024 Expected	2025 Expected	2026 Expected
SBS Traker + HCAL (Hall-A)	30	44	25	36	10	10	0
FT (HallB)	10	10	6	40	5	10	10
RICH (HallB)	300	290	35	18	5	10	10
PolTarg (HallB)	35	40	70	70	25	50	60
High-Lumi (HallB)	-	-	-	-	90	100	100
HPS+BDX (HallA+B)	60	20	30	6	65	170*	200*
Hyper + WACS (Hall-A)	-	10	0	0	0	10	20
Calcolo** (HallA+B)	60	10	3	130	30	30	30
Total (HallA+B)	435	424	180	300	230	390	430

* Assuming to start experiment in 2026

** Computing & Tier1

Milestones Concordate		
Data	**Descrizione**	Completamento
29-04-2023	**BDX: sottomissione articolo BDX-mini**	100 %
29-06-2023	**HPS: sottomissione articolo dati 2016**	100 %
29-06-2023	**H-LUMI: caratterizzazione prototipi per ottimizzazione readout 2D**	100 %
29-06-2023	**POLTARGET: apparato a bulk di superconduttori pronto per misura a doppio campo**	100 %
30-08-2023	**RICH: release versione 2 del software di ricostruzione**	100 %
31-12-2023	**H-LUMI: disegno prototipo a grande area**	100 %
31-12-2023	**SBS Tracker: predisposizione tracciatore per fasci di alta intensita'**	100 %
31-12-2023	**CALCOLO: implementazione del software di CLAS12 al Tier1**	0 %
31-12-2023	**CLAS12: completamento ricostruzione pass2 dati deuterio (RGB)**	50 %