Intro to the session on Early Science

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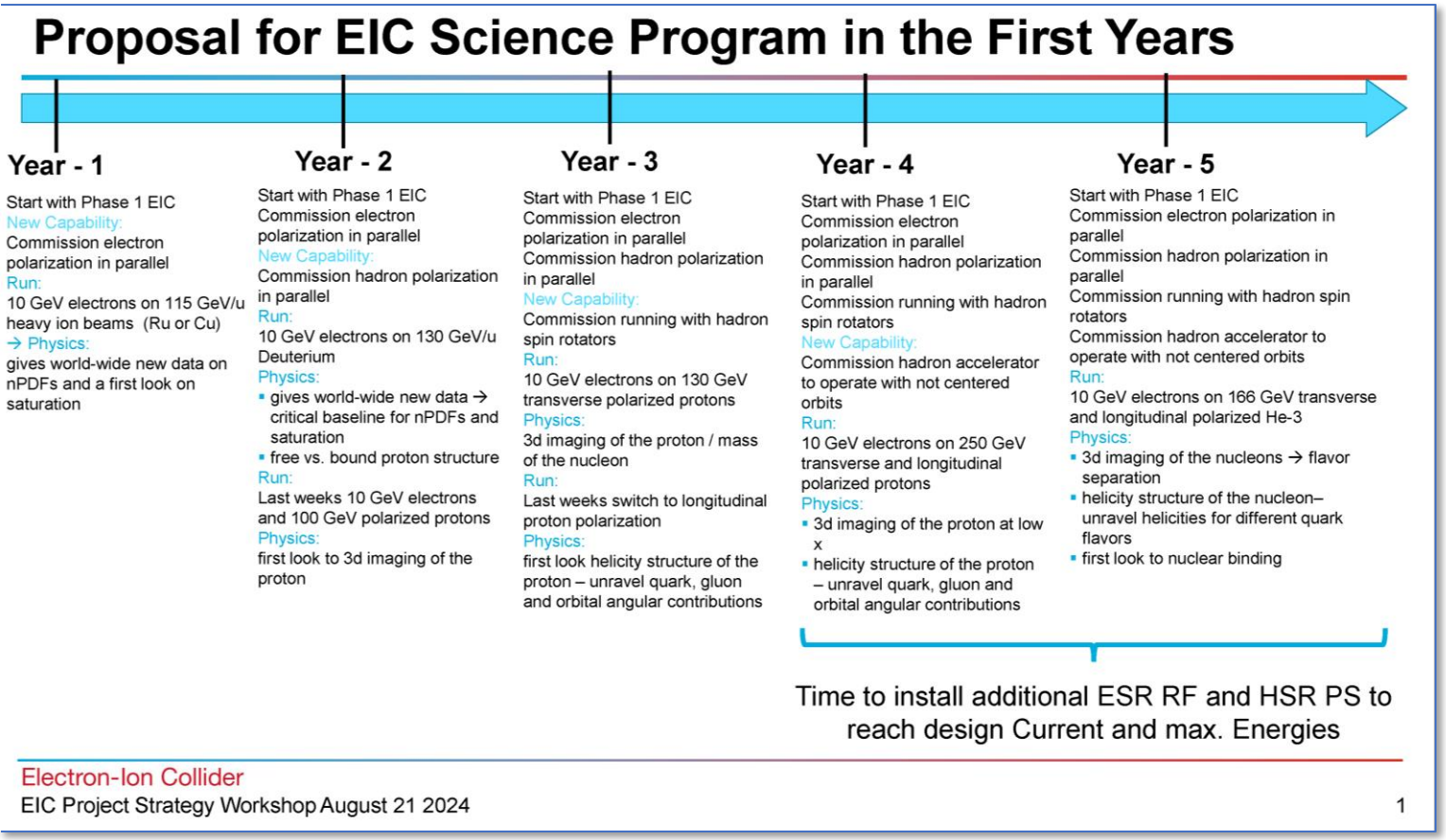
ePIC Collaboration Meeting – January 2025

From Elke's talk @ Strategy Workshop



- It's beneficial that we demonstrate to DOE that ePIC/EIC will achieve **a meaningful and impactful science program within the first 5 years**
- At the summer EICUG/ePIC meeting, Elke kicked off the discussion on what **phasing the EIC** might mean to an **early science program**
- This starting point has generated a growing discussion within the collaboration

This has led to a first ePIC Early Science Workshop in September 2024.
https://indico.bnl.gov/event/24432/

Table of requirements based on previous Elke's presentations

Expected luminosities

- Each year: 1/2 year operation with 80% uptime
- eA luminosity is per nucleon
- ep luminosity range for low - high divergence
- *For years with two species, division is just a guess*

	Species	Energy	Luminosity (fb^{-1})	e polarization	p/A polarization
Year 1	e+Ru or e+Cu	10 x 115	0.9	N/A	N/A
Year 2	e+d (21 weeks)	10 x 130	9.2	N/A	N/A
	e+p (5 weeks)	10 x 130	0.95 - 1.03	N/A	trans?
Year 3	e+p	10 x 130	4.95 - 5.33	N/A	trans & long
Year 4	e+Au (13 weeks)	10 x 100	0.42	N/A	N/A
	e+p (13 weeks)	10 x 250	3.09 - 4.59	N/A	trans & long
Year 5	e+Au (13 weeks)	10 x 100	0.42	N/A	N/A
	e+^{3}He (13 weeks)	10 x 166	4.33	N/A	trans & long

Goals

- **Hard constraints by the phasing of the machine and detector**
- Within those constraints:
  - Compelling science deliverables?
  - Priorities for the E.S. case: which process we should focus on?
  - Final deliverable?
    - a paper on the E.S.?
    - a chapter in the larger ePIC science paper?
- We plan to hold **E.S. workshops at regular intervals** to follow up on progress and suggestions
  - A follow-up workshop in ~March will have fits projections by all PWGs according to the priority list we establish today

Agenda

09:00	**Introduction and Setting the Stage**	*Salvatore Fazio*	
	Sala degli Svizzeri, Villa Mondragone, Monte Porzio Catone (RM), Italy	09:00 - 09:10	
	Configuration and Capabilities for the Phase-1 EIC	*Elke-Caroline Aschenauer*	→ Update from the project
	Sala degli Svizzeri, Villa Mondragone, Monte Porzio Catone (RM), Italy	09:10 - 09:40	
	Theory: TMDs and GPDs with early data	*Alessandro Bacchetta*	
10:00	*Sala degli Svizzeri, Villa Mondragone, Monte Porzio Catone (RM), Italy*	09:40 - 10:10	
	Theory: Opportunities for first EIC physics	*Dr Maria Zurita*	→ Guidance from theory
	Sala degli Svizzeri, Villa Mondragone, Monte Porzio Catone (RM), Italy	10:10 - 10:40	
	Coffee Break		
11:00	*Sala degli Svizzeri, Villa Mondragone, Monte Porzio Catone (RM), Italy*	10:40 - 11:10	
	SIDIS Early Science Plans	*Ralf Seidl et al.*	
	Sala degli Svizzeri, Villa Mondragone, Monte Porzio Catone (RM), Italy	11:10 - 11:30	
	Jets/HF Early Science Plans	*Rongrong Ma*	→ Plans and projections by some PWGs
	Sala degli Svizzeri, Villa Mondragone, Monte Porzio Catone (RM), Italy	11:30 - 11:50	
	Plans with exclusive and diffractive probes	*Raphael Dupre et al.*	
12:00	*Sala degli Svizzeri, Villa Mondragone, Monte Porzio Catone (RM), Italy*	11:50 - 12:10	
	Open Mic (5' Flash Talks)	*Salvatore Fazio*	
	Sala degli Svizzeri, Villa Mondragone, Monte Porzio Catone (RM), Italy	12:10 - 12:40	
	Discussion of Future Early Science Deliverables	*Salvatore Fazio*	→ Open mic and priority discussion
13:00	*Sala degli Svizzeri, Villa Mondragone, Monte Porzio Catone (RM), Italy*	12:40 - 13:10	