

# Program Advisory Committee (PAC)

**Markus Diehl**

*PAC chair from 2020 to 2024*

**JSA S&T Mission Committee Meeting**

**December 10, 2024**

# Outline

- Committee Charge
- Basic procedures and policies
- Developments in the last 5 years
- 
- Backup: PAC summary tables from 2023 and 2024
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# PAC charge

[text marking in red is mine]

- Review new proposals, previously conditionally approved proposals, and letters of intent for experiments that will utilize the 12 GeV upgrade of CEBAF and provide advice on their **scientific merit, technical feasibility and resource requirements**.
- Identify proposals that represent high quality physics within the range of scientific importance represented by the previously approved 12 GeV proposals and recommend for approval.
- Also provide a recommendation on **scientific rating and beam time allocation** for proposals newly recommended for approval.
- Identify other proposals with physics that have the potential for falling into this category pending clarification of scientific and/or technical issues and recommend for **conditional approval**. Provide comments on **technical and scientific issues that should be addressed** by the proponents prior to review at a future PAC.

# PAC recommendation categories

- **Approved**
- **Conditionally approved (C1)**  
pending technical review by the Lab
- **Conditionally approved (C2)**  
pending further review by a future PAC
- **Deferred**
- **Rejected**  
not used since 2019 (at least)

# Role of the JLUO Chair in the PAC

- Monitor communications between PAC and spokespersons – identify issues.
- Monitor PAC meeting proceedings for conflicts of interest.
- Monitor PAC meeting proceedings to identify issues of fairness and ethical behavior.
- Participate in all scientific discussions to provide additional expertise.
- **New since 2023: the JLUO Chair-Elect participates in all PAC sessions as well.**  
**This has several advantages:**

further strengthen user representation

ease the transition from one year to the next

If the JLUO Chair is closely involved in an experiment, then she or he is replaced by the Chair-Elect in the corresponding PAC discussion.

# Jeopardy review: policy

- Proposals that have been approved for 4 years or more but are not scheduled will be considered in Jeopardy.
- Use normal yearly PAC to address these. Estimate about 5-10 proposals per meeting.
- Started in 2019 and reached a steady state in 2024.  
(Experiments reviewed in 2024 had previous review in 2020.)

# Jeopardy review: questions

[text marking in red is mine]

- Is there any new information that would affect the **scientific importance or impact** of the Experiment since it was originally proposed?
- If the experiment has already received a portion of its allocated beam time, the spokespersons should present the **status of the analysis of the existing data and the projected result for the final complete data set**. The goal is to show the physics impact of the beam time requested in the jeopardy update.
- What is the **status of the collaboration** in terms of institutes, committed staff, and prospective students?
- Should the remaining **beam time allocation and experiment grade** be reconsidered?

New since 2023: an **increase in beam time** cannot be requested at the Jeopardy Review.

It requires submission of a full new proposal.

# PAC membership in 2024

- Elke Caroline Aschenauer  
*Brookhaven National Laboratory*
- Keith Baker  
*Yale University*
- Markus Diehl (current chair)  
*Deutsches Elektronen-Synchrotron DESY*
- Pasquale Di Nezza (**incoming chair**)  
*Laboratori Nazionali di Frascati*
- Alexandra Gade  
*Facility for Rare Isotope Beams*
- Cynthia Hadjidakis  
*Universite Paris-Saclay / CNRS*
- Yordanka Ilieva (JLUO chair)  
*University of South Carolina*
- Kresimir Kumericki  
*University of Zagreb*
- Curtis A. Meyer  
*Carnegie Mellon University*
- Marco Radici  
*INFN Sezione di Pavia*
- Shin'ya Sawada  
*KEK*
- Concettina Sfienti  
*Johannes-Gutenberg Universität Mainz*
- Feng Yuan  
*Lawrence Berkeley National Laboratory*
- Geralyn (Sam) Zeller  
*Fermi National Accelerator Laboratory*



# PAC sessions since the 2022 review

## PAC 51, July 24 to 28, 2023

- Proposals: **5** approved, **1** rated C2, **5** rated C1 (all with positron beams), **3** deferred
- **1** run group addition endorsed
- Jeopardy: **7** experiments recommended to stay active
- Feedback on **16** Letters of Intent

## PAC 52, July 8 to 12, 2024

- Proposals: **8** approved, **1** rated C2, **1** rated C1 (with positron beams), **3** deferred
- Jeopardy: **5** experiments recommended to stay active, **1** experiment status changed to C2
- Feedback on **11** Letters of Intent

**The number of LOIs has strongly increased:  
from 2019 to 2022 the committee had received 16 in total**

# Experiments with positron beams

*From the cover letter of PAC 51 (2023) [\[link\]](#)*

- Six out of 16 proposals and 5 out of the 16 letters of intent concern experiments with positron beams and cover a broad range of physics topics. This testifies to the increasing interest in a positron program at the laboratory.

The Committee was pleased to see that **work in the lab towards realizing positron beams has progressed and allowed to define a first set of likely beam parameters**. This provides valuable orientation to both proponents and to this Committee.

As in previous years, our **recommendations** in this report **are based on the hypothesis that it will be possible to deliver beams with the specifications given in the proposals**. In this spirit, all approvals of proposals with positron beams are conditional, with a future review either by the laboratory or by the PAC.

# Recurring topics

*From the cover letter of PAC 52 (2024) [\[link\]](#)*

- As in previous years, the PAC received several proposals aiming at studying **short-range correlations in nuclei**. This documents the continued interest in this physics.

The committee feels that it may be beneficial for the lab to **organize a forum** (for instance a working group or a series of meetings) that would **join interested experimental groups and theorists**, with the aim of **developing a strategy** to bring this important field forward, regarding **key measurements, observables, and their theoretical interpretation**.

# Trends in reviewing

## *From the cover letter of PAC 52 (2024) [\[link\]](#)*

- The PAC upholds its **high standards** for approving proposals and would like to point out several points that have come up in the review this year. (i) As a general rule, the PAC expects a proposal to contain estimates for both **statistical and** (correlated and uncorrelated) **systematic uncertainties**. The basis of these estimates must be clearly documented. [...] (ii) To assess the physics reach of a proposal, it is often necessary to have a **comparison with theory or model predictions, including their uncertainty or plausible range of variation**. (iii) [...] (iv) It is important to **distinguish between observables** of a measurement **and quantities derived from them**, such as TMDs, GPDs, or gravitational form factors. The extraction of derived quantities typically includes **uncertainties from theory** that an experimental proposal may or may not be able to quantify. It is inadequate to omit these uncertainties when they affect the main deliverable of the proposal. (v) [...]
- The committee acknowledges the diligence of proponents in **replying to questions by the readers ahead of the PAC meeting**. However, it should be kept in mind that the exchange between readers and proponents is meant to clarify specific questions, but not to fill in major gaps in a proposal. **A proposal must contain all essential information.**

## Instead of a Summary

- 2024 was my last year as PAC chair.

My thanks go to the Lab, especially to Thia Keppel and to Bob McKeown, for giving me the opportunity to serve in this position, and for the trust they have put in me. I also thank all PAC members and Lab representatives with whom I had the pleasure to work in the last five years.

- Pasquale Di Nezza has taken over, preparing for PAC 53 in 2025.

He served as a regular PAC member this year. I had benefited from the same arrangement (regular PAC member in 2019 before becoming chair in 2020) and regard this as most useful for an incoming chair, to get accustomed to the activities at the Lab and to the ways in which the Committee works.

# Backup: summary tables 2024

## PAC52 Results

NUMBER	TITLE	CONTACT PERSON	HALL	DAYS REQUESTED	DAYS AWARDED	SCIENTIFIC RATING	PAC DECISION
<b>New Proposals</b>							
PR12-24-001	Measurement of the Nuclear Dependence of $R = \frac{\sigma_L}{\sigma_T}$ in Semi-Inclusive Deep Inelastic Scattering	Dave Gaskell	C	5	7	A-	approved
PR12-24-002	Exploring the Transition Region of QCD with the Proton's $g_2$ Spin Structure Function	David Ruth	C	26			C2
PR12-24-003	Studying Lambda interactions in nuclear matter with the $^{208}\text{Pb}(e,e' K^+)$ ( $^{208}\text{Lambda}$ )TI reaction	Franco Garibaldi	C	42	42	A-	approved
PR12-24-004	Study of charge symmetry breaking in p-shell hypernuclei	Toshiyuki Gogami	C	24	24	A-	approved
PR12+24-005	A Dark Photon Search with a JLab positron beam	Bogdan Wojtsekhowski	B	55	55	A-	C1
PR12-24-006	GlueX-III: a path to the Luminosity Frontier in Hall D	Matthew R Shepherd	D	200	200	A	approved
PR12-24-007	Nuclear Dependence of Beam Normal Single Spin Asymmetry in Elastic Scattering from Nuclei	Ciprian Gal	C	9	9	A	approved
PR12-24-008	Inclusive Studies of $^3\text{N}$ Short-Range Correlations	Burcu Duran	C	57			deferred
PR12-24-009	Exclusive electro-disintegration of tensor polarized deuterium	Nathaly Santiesteban	C	86			withdrawn

# Backup: summary tables 2024

PR12-24-010	High-precision measurement of $\mu_p G_E^p/G_M^p$ at $Q^2 = 3.7$ GeV <sup>2</sup> via Polarization Transfer	Andrew Puckett	A	2	2	A-	approved
PR12-24-011	Study of a triaxially deformed nucleus using a Lambda particle as a probe	Satoshi N Nakamura	C	28	28	A-	approved
PR12-24-012	Isospin structure of 3N short-range correlations and the nucleon structure functions in 3H and 3He	Shujie Li	C	53			deferred
PR12-24-013	An isospin dependence study of the Lambda-N interaction through the high precision spectroscopy of Lambda hypernuclei	Satoshi N Nakamura	C	62 (55)	55	A-	approved

NUMBER	TITLE	CONTACT PERSON	HALL	DAYS REQUESTED	DAYS AWARDED	PAC DECISION
<b>Conditonal</b>						
C12-23-009	Nuclear Charm Production and Short-Range Correlations	Or Hen	D	100		deferred
<b>Jeopardy</b>						
J12-24-RunGroupA	11 GeV Polarized Electrons on Liquid Hydrogen Target to Study Proton Structure, 3D Imaging, and Gluonic Excitations	Latifa Elouadrhiri	B	65	65	remain active
J12-24-RunGroupB	CLAS12 Run-Group B: electroproduction on deuterium with CLAS12	Silvia Niccolai	B	51	51	remain active
J12-24-RunGroupC	Run Group C Jeopardy Update Document	Sebastian Kuhn	B	40	40	remain active
J12-24-RunGroupH	CLAS12 Run-Group H: electroproduction on transversely polarized proton with CLAS12	Marco Contalbrigo	B	110		change status to C2
E12-11-006	Heavy Photon Search Experiment	Tim Nelson	B	105	105	remain active
E12-14-001	The EMC Effect in Spin Structure Functions	William Brooks	B	55	55	remain active

# Backup: summary tables 2023

## PAC51 Results

NUMBER	TITLE	CONTACT PERSON	HALL	DAYS REQUESTED	DAYS AWARDED	SCIENTIFIC RATING	PAC DECISION	TOPIC
<b>New Proposals</b>								
PR12-23-001	Measurement of the Generalized Polarizabilities of the Proton in Virtual Compton Scattering	Nikos Sparveris	C	62	62	A-	Approved	2
PR12+23-002	Beam Charge Asymmetries for Deeply Virtual Compton Scattering on the Proton at CLAS12	Eric Voutier	B	100	100	A-	C1	4
PR12+23-003	Measurement of Deep Inelastic Scattering from Nuclei with Electron and Positron Beams to Constrain the Impact of Coulomb Corrections in DIS	Dave Gaskell	C	9.3	9.3	A-	C1	5
PR12-23-004	A Search for a Nonzero Strange Form Factor of the Proton at 2.5 (GeV/c) <sup>2</sup>	Bogdan Wojtsekhowski	C	45	45	A-	Approved	2
PR12+23-005	A Dark Photon Search with a JLab positron beam	Bogdan Wojtsekhowski	B	60			Deferred	6
PR12+23-006	Deeply Virtual Compton Scattering using a positron beam in Hall C	Carlos Munoz Camacho	C	137	137	A-	C1	4
PR12-23-007	A Measurement of the Proton g <sub>2</sub> Structure Function at Intermediate Q <sup>2</sup>	David Ruth	C	33			Deferred	2
PR12+23-008	A Direct Measurement of Hard Two-Photon Exchange with Electrons and Positrons at CLAS12	Axel Schmidt	B	55	55	A	C1	2
PR12-23-009	Nuclear Charm Production and Short-Range Correlations in Hall D	Or Hen	D	100			C2	5



# Backup: summary tables 2023

## PAC51 Results Cont.

NUMBER	TITLE	CONTACT PERSON	HALL	DAYS REQUESTED	DAYS AWARDED	SCIENTIFIC RATING	PAC DECISION	TOPIC
<b>New Proposals (cont'd)</b>								
PR12-23-010	Color Transparency in Maximal Rescattering Kinematics	Holly Szumila-Vance	C	95	40	B+	Approved	5
PR12-23-011	Precision Deuteron Charge Radius Measurement with Elastic Electron-Deuteron Scattering	Dipangkar Dutta	B	40			Deferred	3
PR12+23-012	A measurement of two-photon exchange in unpolarized elastic positron-proton and electron-proton scattering	Michael Nycz	C	56	56	A-	C1	2
PR12-23-013	Measuring Short-Range Correlations with ALERT	Florian Hauenstein	B	17	17	A	Approved	5
PR12-23-014	Measurements of the Ratio $R = \sigma_L/\sigma_T$ , $p/d$ ratios, $P_t$ dependence, and azimuthal asymmetries in Semi-Inclusive DIS $\pi^0$ production from proton and deuteron targets using the NPS in Hall C	Peter Bosted	C	7	7	A-	Approved	4

# Backup: summary tables 2023

## PAC51 Results Cont.

NUMBER	TITLE	CONTACT PERSON	HALL	DAYS REQUESTED	DAYS AWARDED	PAC DECISION	TOPIC
<b>Jeopardy</b>							
C12-15-006	Measurement of Tagged Deep Inelastic Scattering	Dipangkar Dutta	A,C	60	27	Remain active with C1 status	3
E12-13-011	The Deuteron Tensor Structure Function b1	Karl Slifer	C	47.4	41	Remain active	3
E12-14-002	Precision Measurements and Studies of a Possible Nuclear Dependence of R	William Henry	C	22	22	Change rating from B to A-	5
E12-15-005	Measurements of the Quasi-Elastic and Elastic Deuteron Tensor Asymmetries	Elena Long	C	52.8	45	Remain active	5
E12-15-008	An isospin dependence study of the Lambda-N interaction through the high precision spectroscopy of Lambda hypernuclei with electron beam	Satoshi N. Nakamura	C	61	28	Remain active	5
E12-16-001	Dark Matter search in a Beam Dump eXperiment (BDX)	Marco Battaglieri	A	n/a	n/a	Remain active	6
E12-17-008	Polarization Observables in Wide-Angle Compton Scattering at large s, t and u	David Hamilton	C	46	46	Remain active	2