JLab Program Advisory Committee

Outline

- PAC overview
- PAC history since 2009
- PAC 38 (August 2011)
- PAC 39 (June 2011)

PAC overview

- Meets 1–2 times per year (usu January & August)

➡ Recommend **Approval** (yes), **Deferral** (no),
Conditional approval (maybe):
C2 – must satisfy technical requirements to JLab mgmt.
C1 – must come back to the PAC
C3 – 6 GeV: run if room magically appears in schedule

➡ Assign **Grades** for scientific priority: A, A–, B+, B, B–

➡ Allocate **PAC-days** of beamtime: 1 PAC day ≈ 2 real days

- Since 2009, has considered only new proposals for 12 GeV program
"**Approve**" for 12 GeV = proposals of high priority that
should be in the top 50% of experiments to
run in the first 5 years of the upgrade

PAC38 Membership

NAOMI MAKINS (Chair)
University of Illinois

EMLYN HUGHES
Columbia University

REINHARD BECK
Helmholtz-Institut fuer Strahlen- und Kernphysik , Bonn

WILLIAM J. MARCIANO
Brookhaven National Lab

DIEGO BETTONI
Istituto Nazionale di Fisica Nucleare
Italy

EWA RONDIO
Soltan Inst. for Nuclear Studies
Poland

HANS-JÜRGEN ARENDS
Institut für Kernphysik
Johannes Gutenberg-Universität Mainz

SEBASTIAN KUHN
Old Dominion University

NICOLE D'HOSE
Centre d'Etudes de Saclay (CEA-Saclay)

PIET MULDERS
Vrije Universiteit
NETHERLANDS

HAIYAN GAO
Duke University, Durham, NC

MARC VANDERHAEGHEN
Institut für Kernphysik
Johannes Gutenberg-Universität Mainz

BRADLEY SHERRILL
Facility for Rare Isotope Beams
Michigan State University

Typical Agenda

08:30 – 09:30	**Executive Session – Organization**
	Overview
09:30 – 10:00	Director's Comments
10:00 – 10:15	Charge discussion
10:15 – 10:30	**Coffee Break**
	Status Reports
	10:30 – 10:45 6 GeV Program Overview
	10:45 – 11:00 Hall A Report
	11:00 – 11:15 Hall B Report
	11:15 – 11:30 Hall C Report
	11:30 – 11:45 Hall D Report
	11:45 – 12:00 Accelerator Ops Report
12:00 – 13:00	**Lunch with Hall Leaders and Accelerator Rep.**
13:00 – 13:30	Executive Session
13:30 – 14:15	Rapporteur talk
14:15 – 15:15	**Grading Session** (10 min each: 5 minute presentation and 5 minute discussion)
	E12-06-108 Hard Exclusive Electroproduction of π° and η with CLAS 12
	E12-06-114 Measurement of Electron-Helicity Dependent Cross Sections of Deeply Virtual Compton Scattering with CEBAF at 12 GeV
	E12-06-119 Deeply Virtual Compton Scattering with CLAS at 11 GeV
	E12-07-105 Scaling Study of the L-T Separated Pion Electro-production Cross-Section at 11 GeV

- Presentations: first 3.5 days

Hall overviews

approved proposals being graded

Typical Agenda

08:30 – 09:00	**Executive Session**
09:00 – 09:30	**PR12-11-109** Studies of Dihadron Electroproduction in DIS with Unpolarized and Longitudinally Polarized Hydrogen and Deuterium Targets
09:30 – 10:00	**PR12-11-106** High Precision Measurement of the Proton Charge Radius
10:00 – 10:30	**PR12-11-110** The Deuteron Tensor Structure Function b_1
10:30 – 11:00	**Coffee Break**
11:00 – 12:00	**Executive Session**
12:00 – 13:00	**Working Lunch**
13:00 – 13:30	**Executive Session**
13:30 – 14:00	**PR12-11-101 PREX-II:** Precision Parity-Violating Measurement of the Neutron Skin of Lead
14:00 – 14:30	**PR12-11-104** Hard Photodisintegration of ^{3}He into *pp* and *pn* pairs
14:30 – 15:00	**Coffee Break**
15:00 – 17:00	**Executive Session**

- Presentations: first 3.5 days

new or conditionally-approved proposals

- Voting & grading: final day

Categories to be Used for the Assignment of Scientific Priority to the 12 GeV Experiments

1. **The Hadron spectra as probes of QCD** (GluEx and heavy baryon and meson spectroscopy)	PAC36 Aug '10
2. **The transverse structure of the hadrons** (Elastic and transition Form Factors)	PAC35 Jan '10
3. **The longitudinal structure of the hadrons** (Unpolarized and polarized parton distribution functions)	PAC36 Aug '10
4. **The 3D structure of the hadrons** (Generalized Parton and Transverse Momentum Distributions)	PAC38 Aug '11
5. **Hadrons and cold nuclear matter** (Medium modification of the nucleons, quark hadronization, N-N correlations, hypernuclear spectroscopy, few-body expts)	PAC36 Aug '10
6. **Low-energy tests of the Standard Model and Fundamental Symmetries** (Møller, PVDIS, PRIMEX, ...)	PAC37 Jan '11

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1. **The Hadron spectra as probes of QCD**
   (GluEx and heavy baryon and meson spectroscopy) — PAC36 Aug '10

2. **The transverse structure of the hadrons**
   (Elastic and transition Form Factors) — Form Factors — PAC35 Jan '10

3. **The longitudinal structure of the hadrons**
   (Unpolarized and polarized parton distribution functions) — PAC36 Aug '10

4. **The 3D structure of the hadrons**
   (Generalized Parton and Transverse Momentum Distributions) — PAC38 Aug '11

5. **Hadrons and cold nuclear matter**
   (Medium modification of the nucleons, quark hadronization, N-N correlations, hypernuclear spectroscopy, few-body expts) — PAC36 Aug '10

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   (Møller, PVDIS, PRIMEX, ...) — PAC37 Jan '11

Categories to be Used for the Assignment of Scientific Priority to the 12 GeV Experiments

1. The Hadron spectra as probes of QCD **(GluEx and heavy baryon and meson spectroscopy)**	Spectroscopy	PAC36 Aug '10
2. The transverse structure of the hadrons **(Elastic and transition Form Factors)**	Form Factors	PAC35 Jan '10
3. The longitudinal structure of the hadrons **(Unpolarized and polarized parton distribution functions)**	20th Cent PDFs	PAC36 Aug '10
4. The 3D structure of the hadrons **(Generalized Parton and Transverse Momentum Distributions)**		PAC38 Aug '11
5. Hadrons and cold nuclear matter **(Medium modification of the nucleons, quark hadronization, N-N correlations, hypernuclear spectroscopy, few-body expts)**	Nuclear Effects	PAC36 Aug '10
6. Low-energy tests of the Standard Model and Fundamental Symmetries **(Møller, PVDIS, PRIMEX, ...)**		PAC37 Jan '11

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6. Low-energy tests of the Standard Model and Fundamental Symmetries (Møller, PVDIS, PRIMEX, ...)	SM / FS	PAC37 Jan '11

Categories to be Used for the Assignment of Scientific Priority to the 12 GeV Experiments

1. **The Hadron spectra as probes of QCD** (GluEx and heavy baryon and meson spectroscopy)	Spectroscopy	PAC36 Aug '10
2. **The transverse structure of the hadrons** (Elastic and transition Form Factors)	Form Factors	PAC35 Jan '10
3. **The longitudinal structure of the hadrons** (Unpolarized and polarized parton distribution functions)	20th Cent PDFs	PAC36 Aug '10
4. **The 3D structure of the hadrons** (Generalized Parton and Transverse Momentum Distributions)	21st Cent PDFs	PAC38 Aug '11
5. **Hadrons and cold nuclear matter** (Medium modification of the nucleons, quark hadronization, N-N correlations, hypernuclear spectroscopy, few-body expts)	Nuclear Effects	PAC36 Aug '10
6. **Low-energy tests of the Standard Model and Fundamental Symmetries** (Møller, PVDIS, PRIMEX, ...)	SM / FS	PAC37 Jan '11

Categories to be Used for the Assignment of Scientific Priority to the 12 GeV Experiments

1. **The Hadron spectra as probes of QCD**
   (GluEx and heavy baryon and meson spectroscopy)
   Spectroscopy — PAC36 Aug '10

2. **The transverse structure of the hadrons**
   (Elastic and transition Form Factors)
   Form Factors — PAC35 Jan '10

3. **The longitudinal structure of the hadrons**
   (Unpolarized and polarized parton distribution functions)
   20th Cent PDFs — PAC36 Aug '10

4. **The 3D structure of the hadrons**
   (Generalized Parton and Transverse Momentum Distributions)
   21st Cent PDFs — PAC38 Aug '11

5. **Hadrons and cold nuclear matter**
   (Medium modification of the nucleons, quark hadronization, N-N correlations, hypernuclear spectroscopy, few-body expts)
   Fragmentation
   Nuclear Effects — PAC36 Aug '10

6. **Low-energy tests of the Standard Model and Fundamental Symmetries**
   (Møller, PVDIS, PRIMEX, …..)
   SM / FS — PAC37 Jan '11

What the PAC currently treats as Foreseen Equipment

- Hall A: 3 major apparati in preparation
  - **Moller**: fully approved at PAC 34
  - **Super BigBite**: start commissioning maybe FY14, no physics until FY15
  - **SoLID**: technical conceptual design approved, appears in several approved experiments
- Hall B **CLAS 12**
- Hall C existing **HMS** + new **SuperHMS**
- Hall D **GlueX**

Complementarity: SIDIS

- Hall A **3He** target with **large acceptance**
  - **Super BigBite** **Kaon** identification
  - **SoLID** large **forward** acceptance
- Hall B **H,D** targets with **large acceptance**
  - **CLAS 12**
- Hall C **Precision**
  - existing **HMS** + new **SuperHMS**

PAC 35 (Jan. 2010)

- Approved 7 proposals (4 Deferrals, 1 C2)
- Assigned grades to 8 approved proposals in category ❷ Transverse Structure of Nucleons

Form Factors

PAC 36 (Jan. 2010)

- Assigned grades to 16 approved proposals in the categories
  - ❶ Hadron Spectra as Probes of QCD
  - ❸ Longitudinal Structure of Hadrons
  - ❺ Hadrons and Cold Nuclear Matter

Spectroscopy

20th Cent PDFs

Nuclear Effects

PAC 37 (Jan. 2010)

- Assigned grades to 3 approved proposals in the category
  - ❻ Low-energy tests of the Standard Model and Fundamental Symmetries

SM / FS

- Approved 11 proposals
  (3 Deferrals, 4 C2, 1 C1)
  * many from previously-graded categories → maybe go through everything once more ...

PAC 38 Result (Aug. 2011)

- Considered 13 new proposals, 7 Letters of Intent, 1 previously conditionally approved.
- Assigned grades to 15 previously approved proposals in the category
  - ❹ The 3D structure of the hadrons

21st Cent PDFs

- 5 Proposals recommended for Approval
- 4 Proposals deferred, 1 rejected
- 4 Conditionally approved (C2 – must return to PAC)

➡ All approved 12 GeV proposals now have
- Scientific rating
- Beamtime allocation

12 GeV Approved Experiments by Physics Topics

Topic	Hall A	Hall B	Hall C	Hall D	Total
The Hadron spectra as probes of QCD (GluEx and heavy baryon and meson spectroscopy)		1		1	**2**
The transverse structure of the hadrons (Elastic and transition Form Factors)	4	2	2		**8**
The longitudinal structure of the hadrons (Unpolarized and polarized parton distribution functions)	2	2	5		**9**
The 3D structure of the hadrons (Generalized Parton Distributions and Transverse Momentum Distributions)	4	8	3		**15**
Hadrons and cold nuclear matter (Medium modification of the nucleons, quark hadronization, N-N correlations, hypernuclear spectroscopy, few-body experiments)	2	2	6		**10**
Low-energy tests of the Standard Model and Fundamental Symmetries	3			1	4
TOTAL	**15**	**15**	**16**	**2**	**48**

E12-11-105 has not been counted with the experiments since it is considered a test

12 GeV Approved Expts by PAC Days

(All approved experiments received scientific rating since last PAC)

	Hall A	Hall B	Hall C	Hall D	Total
The Hadron Spectra as Probes of QCD (GluEx & heavy baryon and meson		119		120	239
The Transverse Structure of the Hadrons (elastic and transition form factors)	144	70	102		316
The Longitudinal Structure of the Hadrons (Unpolarized and polarized parton	65	120	140		325
The 3D Structure of the Hadrons (GPDs and TMDs)	289	802	108		1199
Hadrons and Cold Nuclear Matter	54	120	179		353
Low-Energy Tests of the Standard Model and Fundamental Symmetries	547			79	535
Total	1099	1231	529	199	3058

- E12-11-105 has not been included here since it is an injector test expt
- 638 PAC days in Hall A are associated with the Moller and SOLID programs

PAC39

- Scheduled for week of June 18, 2012
- Consider 12 new proposals, 5 returning conditional proposals, & 4 letters of intent
- Hall Leaders to present “early running” plans
- Discussion of priorities, jeopardy, etc.