



# Collaboration Meeting

June 13-16, 2017

# Report on CCC Meeting

- Following the guidance in the Common Tools report, we will form an analysis review committee for the first paper(s).
  - Purpose is to start reviewing the components of the analysis note as they become available with an initial focus on the elements common across the Run Group A experiments. An early start will speed up the first publication(s).
  - Run Group A has experiments from two working groups so they must decide which experiments are the best choices for the first paper(s).
  - In the initial phase the committee will have three members and focus on the elements common across the working groups.
  - Later, two members will be added as the physics components become prominent.
- The ACE committee has produced a draft CLAS12 Analysis Procedures document. The Coordinating Committee will review the draft and then distribute it to the Collaboration. ACE welcomes abundant feedback on the document!
- Experiment schedule was discussed. More on this next.
- Experiment Scheduling meeting planned at last Collaboration meeting was held on May 18. Report is at the address below. More next.
- Fall CLAS Collaboration meeting dates: Oct 3-6 tentatively (Tuesday-Friday). Let me know if these dates create any problems.

# Hall B – Run Groups

| Proposal                     | Physics  | Contact        | Rating | Days              | Group      | New equipment   | Energy | Run Group              | Target                 |
|------------------------------|--|----------------|--------|-------------------|------------|---|--------|------------------------|------------------------|
| <b>E12-06-108</b>            | Hard exclusive electro-production of $\pi^0, \eta$                 | Stoler         | B      | 80                | <b>139</b> | RICH (1 sector)<br>Forward tagger                     | 11     | <b>A</b><br>F. Sabatié | liquid<br>$H_2$        |
| E12-06-108A                  | Exclusive $N^* \rightarrow KY$ Studies with CLAS12                 | Carman         |        | (60)              |            |   |        |                        |                        |
| E12-06-108B                  | Transition Form Factor of the $\eta'$ Meson with CLAS12            | Kunkel         |        | (80)              |            |   |        |                        |                        |
| <b>E12-06-112</b>            | Proton's quark dynamics in SIDIS pion production                   | Avakian        | A      | 60                |            |   |        |                        |                        |
| E12-06-112A                  | Semi-inclusive $\Lambda$ production in target fragmentation region | Mirazita       |        | (60)              |            |   |        |                        |                        |
| E12-06-112B                  | Collinear nucleon structure at twist-3                             | Pisano         |        | (60)              |            |   |        |                        |                        |
| E12-06-119(a)                | Deeply Virtual Compton Scattering                                  | Sabatie        | A      | 80                |            |   |        |                        |                        |
| E12-09-003                   | Excitation of nucleon resonances at high $Q^2$                     | Gothe          | B+     | 40                |            |   |        |                        |                        |
| <b>E12-11-005</b>            | Hadron spectroscopy with forward tagger                            | Battaglieri    | A-     | 119               |            |   |        |                        |                        |
| E12-11-005A                  | Photoproduction of the very strangest baryon                       | Guo            |        | (120)             |            |   |        |                        |                        |
| E12-12-001                   | Timelike Compton Scatt. & $J/\psi$ production in $e+e^-$           | Nadel-Turonski | A-     | 120               |            |   |        |                        |                        |
| E12-12-007                   | Exclusive $\phi$ meson electroproduction with CLAS12               | Stoler, Weiss  | B+     | 60                |            |   |        |                        |                        |
| E12-07-104                   | Neutron magnetic form factor                                       | Gilfoyle       | A-     | 30                | <b>90</b>  | Neutron detector<br>RICH (1 sector)<br>Forward tagger | 11     | <b>B</b><br>S.Niccolai | liquid<br>$D_2$ target |
| E12-09-007(a)                | Study of partonic distributions in SIDIS kaon production           | Hafidi         | A-     | 30                |            |   |        |                        |                        |
| <b>E12-09-008</b>            | Boer-Mulders asymmetry in K SIDIS w/ H and D targets               | Contalbrigo    | A-     | 56                |            |   |        |                        |                        |
| E12-09-008A                  | Hadron production in target fragmentation region                   | Mirazita       |        | (60)              |            |   |        |                        |                        |
| E12-09-008B                  | Collinear nucleon structure at twist-3                             | Pisano         |        | (60)              |            |   |        |                        |                        |
| <b>E12-11-003</b>            | DVCS on neutron target   | Niccolai       | A      | 90                |            |   |        |                        |                        |
| E12-11-003A                  | In medium structure functions, SRC, and the EMC effect             | Hen            |        | (90)              |            |   |        |                        |                        |
| <b>Beam time partial sum</b> |  |                |        | <b>765 (1355)</b> |            |   |        |                        |                        |

**Experiment ending with A or B are run group experiments approved by the CLAS collaboration. They are running parallel to the experiments with same experiment number. Experiments ending with (a) and (b) take data with both run groups.**

# Hall B – Run Groups

|   |  |           |    |                    |            |   |    |   |   |
|---|--|-----------|----|--------------------|------------|---|----|---|---|
| E12-06-109  | Longitudinal Spin Structure of the Nucleon               | Kuhn      | A  | 80                 | 185        | Polarized target<br>RICH (1 sector)<br>Forward tagger | 11 | C | NH <sub>3</sub><br>ND <sub>3</sub><br>S. Kuhn |
| E12-06-109A   | DVCS on the neutron with polarized deuterium target      | Niccolai  |    | (60)               |            |   |    |   |   |
| E12-06-119(b)                                       | DVCS on longitudinally polarized proton target           | Sabatie   | A  | 120                |            |   |    |   |   |
| E12-07-107  | Spin-Orbit Correl. with Longitudinally polarized target  | Avakian   | A- | 103                |            |   |    |   |   |
| E12-09-007(b)                                       | Study of partonic distributions using SIDIS K production | Hafidi    | A- | 80                 |            |   |    |   |   |
| E12-09-009  | Spin-Orbit correlations in K production w/ pol. targets  | Avakian   | B+ | 103                |            |   |    |   |   |
| E12-06-106  | Color transparency in exclusive vector meson production  | Hafidi    | B+ | 60                 | 60         |   | 11 | D |   |
| E12-06-117  | Quark propagation and hadron formation                   | Brooks    | A- | 60                 | 60         |   | 11 | E | Nuclear                                       |
| E12-06-113  | Free Neutron structure at large x                        | Buelteman | A  | 42                 | 42         | Radial TPC  | 11 | F | Gas D <sub>2</sub>                            |
| E12-14-001  | EMC effect in spin structure functions                   | Brooks    | B+ | 55                 | 55         | Pol. LiH target                                       | 11 | G | LiH   |
| <b>TOTAL CLAS12 run time (approved experiments)</b> |  |           |    | <b>1466 (2118)</b> | <b>631</b> |   |    |   |   |

| Proposal   | Physics  | Contact     | Rating | Days               | Group      | Equipment         | Energy   | Group | Target  |
|--|--|-------------|--------|--------------------|------------|-------------------|----------|-------|---------|
| C12-11-111   | SIDIS on transverse polarized target                   | Contalbrigo | A      | 110                | 110        | Transverse target | 11       | H     | HD      |
| C12-12-009   | Transversity w/ di-hadron on transvere target          | Avakian     | A      | 110                |            |                   |          |       |         |
| C12-12-010   | DVCS with transverse polarized target in CLAS12        | Elouadrhiri | A      | 110                |            |                   |          |       |         |
| <b>All CLAS12 transverse target proposals</b>  |  |             |        | 330                | 110        |                   |          |       |         |
| E12-11-006   | Heavy Photon Search at Jefferson Lab (HPS)             | Jaros       | A      | 180                | 180        | Setup in alcove   | 2.2, 6.6 | I     | Nuclear |
| E12-11-106   | High Precision Measurement of the Proton Charge Radius | Gasparian   | A      | 15                 | 15         | Primex            | 1.1, 2.2 | J     | H2 gas  |
| <b>Beam time request from CLAS12 C1 experiments + non-CLAS12 experiments</b>                   |  |             |        | <b>525</b>         | <b>305</b> |                   |          |       |         |
| <b>Beam time from approved CLAS12 experiments (from previous table)</b>                        |  |             |        | <b>1466 (2118)</b> | <b>631</b> |                   |          |       |         |
| <b>Beam time for Hall B experiments table 1 + table 2 (incl. 110 days of C1 approved exp.)</b> |  |             |        | <b>1991 (2643)</b> | <b>936</b> |                   |          |       |         |

# Hall B – Run Groups

| Proposal   | Physics   | Contact     | Rating | Days               | Group       | Equipment      | Energy   | Group                         | Target |
|--|---|-------------|--------|--------------------|-------------|----------------|----------|-------------------------------|--------|
| E12-16-010   | A search for Hybrid Baryons in Hall B with CLAS12 | D'Angelo    | A-     | (100)              | 100         | Forward Tagger | 6.6, 8.8 | K<br>Confinement & Strong QCD | IH2    |
| E12-16-010A  | Nucleon Resonances in exc. KY electroproduction   | Carman      | A-     | (100)              |             |                |          |                               |        |
| E12-16-010B  | DVCS with CLAS12 at 6.6 and 8.8 GeV               | Elouadrhiri | A-     | (100)              |             |                |          |                               |        |
| <b>Total Beam time of Run Group K</b>  |   |             |        | <b>100 (300)</b>   | <b>100</b>  |                |          |                               |        |
| <b>Beam time of approved &amp; C1 approved CLAS12 experiments from table 1 + table 2</b> |   |             |        | <b>1991 (2643)</b> | <b>936</b>  |                |          |                               |        |
| <b>Beam time for Hall B experiments table 1 + table 2 + table 3</b>                      |   |             |        | <b>2091 (2943)</b> | <b>1036</b> |                |          |                               |        |

| Proposal Count | Experiment Days | Run Groups | RG days     | Compression |
|----------------|-----------------|------------|-------------|-------------|
| <b>37</b>      | <b>2943</b>     | <b>11</b>  | <b>1036</b> | <b>0.35</b> |

In the best of all worlds we expect experiment schedule:

- 35 weeks per year  $\approx 35/2 = 17.5$  PAC weeks = 122.5 PAC days
- With 0.8 Hall multiplicity  $\Rightarrow 122.5 \times 0.8 = 98$  PAC days
- To run 2943 PAC days of individual experiments = 30 years
- Run 2943 PAC days as run groups =  $1036/98 = 10.5$  years

# Scheduling considerations

Assuming all ERR reviews have been passed and beam time requested

- Experiment with hydrogen target to run first to understand detector responses, calibrations
- Provide all Run Groups with significant amount of data during first 5 years
  - => schedule ~50% of total approved Run Group days
- Scientific ratings by the PAC
- Schedule **High Impact** experiments early (PAC41)
- Compatibility with energies used in other Halls
- Benefit to collaboration – timely publication, career advancement
- Operating luminosity
- Jeopardy process
- Infrastructure/setup requirements
- Run group resources

**Final scheduling done in NPES committee. The Collaboration can make recommendations to this committee through the Hall Leader.**

# More Physics Faster

- Automate calibration/reconstruction/analysis procedures to reduce the time to publication – Bob McKeown comments.
- Run groups should test the full analysis chain in simulation BEFORE they run.
- Run groups need to become more specific about running conditions (torus current, polarity, thresholds, etc).
- Possibility of higher luminosity is being studied and could reduce the scheduling pressure. Final conclusions will have to wait until the engineering run.
- As required by the charter, the Coordinating Committee will be responsible for making recommendations to the NPES.

# Possible RG Schedule (straw man)

| Run Group                 | Days          | 2016 | 2017 | 2018     | 2019 | 2020 | 2021 | 2022 | Remain<br>n |
|---------------------------|---------------|------|------|----------|------|------|------|------|-------------|
| All Run Groups            | <b>1036#)</b> | 30   | 15   | 95       | 105  | 105  | 105  | 105  | 456         |
| <b>HPS</b>                | 180*          | 15   |      | 35       | 10   | 10   | 10   | 10   | 90          |
| <b>PRad</b>               | 15*           | 15   |      |          |      |      |      |      | 0           |
| <b>CLAS12 Comm</b>        |               |      | 3 15 |          |      |      |      |      | 0           |
| RG-A + RG-K (proton)      | 239*          |      | 10   | 20/15 25 |      | 35   | 20   |      | 114*        |
| RG-B (deuteron)           | 90*           |      |      |          | 40   |      |      |      | 50*         |
| RG-F (BoNuS)              | 42*           |      |      |          | 21   |      |      |      | 21          |
| RG-C (NH <sub>3</sub> )   | 120           |      |      |          | 35   | 25   |      |      | 60          |
| RG-C-b (ND <sub>3</sub> ) | 65            |      |      |          |      | 35   |      |      | 30          |
| RG-E (Hadr.)              | 60            |      |      |          |      |      | 35   |      | 25          |
| RG-H (Transv. Target)     | 110*          |      |      |          |      |      | 40   | 20   | 50          |
| RG-D (CT)                 | 60            |      |      |          |      |      |      | 40   | 20          |
| RG-G (LiD)                | 55            |      |      |          |      |      |      | 35   | 20          |



Red beamtime – Lower beam energies required for other halls.



# CLAS Issues and Announcements

- Analysis Committee of Experts (ACE) has written a draft of the CLAS12 analysis procedures – See Silvia Niccolai’s CLAS12 Workshop talk and the CLAS12 wiki. ACE welcomes abundant feedback!
- Consider forming an analysis review committee to guide preparations for first experiment (recommendation in Common Tools report).

<https://www.jlab.org/Hall-B/secure/claschair/nov16/CommonToolsReportNov2016.pdf>

- Discussion of run group schedule proposed at last Collaboration meeting was held May 18. Meeting report and materials are available on the CLAS Information here –

[https://wiki.jlab.org/clas\\_chair/index.php/CLAS\\_Collaboration\\_Information](https://wiki.jlab.org/clas_chair/index.php/CLAS_Collaboration_Information)

This topic will become a regular part of the Coordinating Committee meetings.

- PAC 45
  - Will be held during the week of July 10, 2017.
  - [https://www.jlab.org/exp\\_prog/PACpage](https://www.jlab.org/exp_prog/PACpage)

# User Group Announcements

- Officers
  - Chair: Larry Weinstein (Old Dominion University)
  - Chair-Elect: Krishna Kumar (Stony Brook University)
  - Vice-Chair: Julie Roche (Ohio University)
  - Past-Chair: Haiyan Gao (Duke University)
  - Secretary/Treasurer: Lorelei Chopard (Jefferson Lab)
- Selected the thesis and postdoc prize winners (announcement soon).
- Presented the User Group update to the JSA Program Committee at the April JSA meeting.
- Participated in the Nuclear Physics Hill Day on May 22 along with users from FRIB, RHIC and fundamental symmetries.
- Most of the officers met on May 30 with almost the entire DoE Nuclear Physics staff (Tim Hallman, Gulshan Rai, Jehanne Gillo, James Sowinski, Paul Sorensen and Manouchehr Farkhondeh) to demonstrate user enthusiasm and present the case for running JLab 30+ weeks/year.
- Will present a form letter at the User Meeting to be edited and emailed to your representatives and senator to request more funding for Nuclear Physics in general and Jefferson Lab in particular.
- User Group Meeting scheduled for June 19-21.



# Collaboration Meeting

June 16-18, 2016

# PAC41 - High Impact Experiments

Hall B High Impact (H.I.) experiments: **195** PAC days

PRad: **15**

HPS: **39**

BONUS: **21** (\*)

HDIce: **110**

TMD(p): **10**

DVCS(d): **90** (\*\*)

(\*) : **42** if it runs before  $^3\text{H}/^3\text{He}$

(\*\*) : H.I. if HDIce delayed

PAC41 "High Impact" Selection

Row Color  
Yellow = High Impact  
Green = backup expt

| Exp#   | Exp name  | Hall     | Run Group/ Days         | PAC Days                         | PAC grade  | Comments   |            |                                 |
|--|---|----------|-------------------------|----------------------------------|------------|--|------------|---------------------------------|
| <b>TOPIC 1 : SPECTROSCOPY</b>                                  |   |          |                         |                                  |            |  |            |                                 |
| E12-06-102   | <b>GlueX</b> : Mapping the Spectrum of Light Quark Mesons and Gluonic Excitations with Linearly Polarized Photons                                     | D        |                         | (120) approved<br><b>*90</b>     | A          | GlueX - assumed half commissioning/half physics<br><b>*plus (30) commissioning days</b>  |            |                                 |
| <b>TOPIC 2 : FORM FACTORS</b>                                  |   |          |                         |                                  |            |  |            |                                 |
| E12-06-101   | Measurement of the Charged <b>Pion Form Factor</b> to High Q <sup>2</sup>   | C        |                         | <b>52</b>                        | A          | Requires fully commissioned SHMS   |            |                                 |
| E12-07-109   | <b>GEpGMp</b> : Large Acceptance Proton Form Factor Ratio Meas's at 13 and 15 (GeV/c) <sup>2</sup> Using Recoil Polarization Method                   | A        |                         | <b>45</b>                        | A-         | Requires SBS and high power cryo target  |            |                                 |
| E12-11-106   | High Precision Measurement of the <b>Proton Charge Radius</b>   | B        |                         | <b>15</b>                        | A          | Non-CLAS12 experiment, Prad  |            |                                 |
| <b>TOPIC 3 : PDFs</b>  |   |          |                         |                                  |            |  |            |                                 |
| E12-06-113   | <b>BONuS</b> : The Structure of the Free Neutron at Large x-Bjorken   | B        | F140                    | (40) approved<br><b>*21</b><br>↓ | A          | Requires BONuS Radial TPC upgrade<br><b>*42 days High Impact for the experiment</b><br><b>*that runs first; experiments are equally important &amp; both are essential</b> |            |                                 |
| E12-10-103   | <b>MARATHON</b> : Measurement of the F <sub>2n</sub> /F <sub>2p</sub> , d/u Ratios and A-3 EMC Effect in DIS off the Tritium and Helium Mirror Nuclei | A        | Tritium target group/61 | ↑<br><b>*21</b><br>(42) approved | A          |  |            |                                 |
| E12-06-110   | <b>A1n HallC-3He</b> : Meas of Neutron Spin Asymmetry A1n in the Valence Quark Region Using an 11 GeV Beam and a Polarized 3He Target in Hall C       | C        |                         | <b>36</b>                        | A          | Requires high luminosity 3He   |            |                                 |
| <b>TOPIC 4T : TMDs</b>   |   |          |                         |                                  |            |  |            |                                 |
| C12-11-111   | <b>TMD CLAS-HDICE</b> : SIDIS on Transverse polarized target  | B        | G/110                   | <b>110</b><br>concurrent         | A          | Requires transversely polarized HDIce with electron beam   |            |                                 |
| C12-12-009   | <b>Dihadron CLAS-HDICE</b> : Measurement of transversely with dihadron production in SIDIS with transversely polarized target                         | B        | G/110                   | ( <b>110</b> )<br>concurrent     | A          | Requires transversely polarized HDIce with electron beam C1 Proposal   |            |                                 |
| E12-06-112   | <b>TMD CLAS-H(Unpol)</b> : Probing the Proton's Quark Dynamics in Semi-Inclusive Pion Production at 12 GeV  | B        | A/139                   | (60) approved<br><b>*10</b>      | A          | Hall B commissioning + 10 days<br><b>*plus (50) commissioning days</b>   |            |                                 |
| <b>TOPIC 4G : GPDs</b>   |   |          |                         |                                  |            |  |            |                                 |
| E12-06-114   | <b>DVCS HallA-H(UU,LU)</b> : Measurements of Electron-Helicity Dependent Cross Sections of DVCS with CEBAF at 12 GeV                                  | A        | Early: DVCS & GMp/62    | (100) approved<br><b>*70</b>     | A          | Hall A commissioning   |            |                                 |
| C12-12-010   | <b>DVCS CLAS-HDICE</b> : DVCS at 11 GeV with transversely polarized target using the CLAS12 Detector  | B        | G/110                   | ( <b>110</b> )<br>concurrent     | A          | Requires transversely polarized HDIce with electron beam C1 Proposal   |            |                                 |
| E12-11-003   | <b>DVCS CLAS-D(UU,LU)</b> : DVCS on the Neutron with CLAS12 at 11 GeV   | B        | B/90                    | (90) approved                    | A          | Requires D target, central neutron detector ready in 2016<br><b>*Backup GPD-E meas if HDIce delayed</b>  |            |                                 |
| <b>TOPIC 5 : NUCLEAR</b>                                       |   |          |                         |                                  |            |  |            |                                 |
| E12-13-006   | <b>Bubble Chamber</b> : Measurement of 16O( <sup>+</sup> s)12C with a bubblechamber and a bremsstrahlung beam   | INJ      |                         | <b>14</b>                        | A-         | Our guess: 2017  |            |                                 |
| E12-11-101   | <b>PREx-II</b> : Precision Parity-Violating Measurement of the Neutron Skin of Lead   | A        |                         | <b>35</b>                        | A          | Requires septum, Pb target, 1% Moller polarimetry  |            |                                 |
| E12-06-106   | <b>SRC-hiX</b> : Inclusive Scattering from Nuclei at $\lambda > 1\text{\AA}$ in the quasielastic and deeply inelastic regimes                         | C        |                         | <b>32</b>                        | A-         |  |            |                                 |
| E12-11-112   | <b>SRC-Tritium</b> : Precision measurement of the isospin dependence in the 2N and 3N short range correlation region                                  | A        | Tritium target group/61 | <b>19</b>                        | A-         |  |            |                                 |
| <b>TOPIC 6 : FUNDAMENTAL SYMMETRIES</b>                        |   |          |                         |                                  |            |  |            |                                 |
| E12-11-006   | <b>HPS</b> : Status of the Heavy Photon Search Experiment at Jefferson Laboratory (Update on PR12_11_006)   | B        | H/180                   | (155) approved<br><b>*39</b>     | A          | non-CLAS12 experiment, HPS<br><b>*25 pre-CLAS engr + 14 physics @ 4.4 GeV</b>  |            |                                 |
| E12-10-009   | <b>APEX</b> : Search for new Vector Boson A1 Decaying to e-e-   | A        |                         | <b>34</b>                        | A          | Requires new septum and target system  |            |                                 |
| <b>&lt;&lt;&lt; SUMMARY of "HIGH IMPACT" DAYS &gt;&gt;&gt;</b> |   |          |                         |                                  |            |  |            |                                 |
| <b>by Topic</b>  |   | <b>1</b> | <b>2</b>                | <b>3</b>                         | <b>4GT</b> | <b>5</b>   | <b>6</b>   | <b>total post-commissioning</b> |
|  |   | 90       | 112                     | 78                               | 190        | 100  | 73         | 643                             |
| <b>by Hall</b>   |   | <b>A</b> | <b>B</b>                | <b>C</b>                         | <b>D</b>   | <b>D</b>   | <b>INJ</b> |                                 |
|  |   | 224      | 195                     | 120                              | 90         | 14   |            | 643                             |