Jefferson Lab
Thomas Jefferson National Accelerator Facility

# REPORT OF THE 40TH PROGRAM ADVISORY COMMITTEE (PAC40) MEETING

*June 17 – 20th, 2013*

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Jefferson Lab
Thomas Jefferson National Accelerator Facility
Exploring the Nature of Matter

July 17, 2013
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Dear Jefferson Lab Users,

One of the great pleasures that I have as Director is seeing the new and exciting experimental proposals that come from our user community. The quality of these proposals is an indicator of the forefront scientific program that Jefferson Lab enables for its users, and this PAC was no exception.

The Program Advisory Committee (PAC40) reviewed 11 new proposals, 1 conditionally approved proposal, and 4 letters of intent. The committee recommended 6 approvals, one conditional approval, and five deferrals. We accept those recommendations.

In a manner to which we have become accustomed, the PAC committee chaired by Naomi Makins, worked and deliberated at considerable depth all its conclusions and showed enormous concern and appreciation for our program. We would like to go on record with our gratitude for this effort.

Sincerely,

Hugh Montgomery
Laboratory Director

# Remarks from the Chair on behalf of the Committee

The PAC appreciates and strongly encourages the Deputy Director's plans to hold a "prioritization meeting" in the near future. This meeting would give the PAC a chance to review the large backlog of approved 12 GeV experiments and to contribute in some way to the selection of a high impact group of experiments for the first 3-5 years of production running. The term "high impact" has yet to be defined precisely, but a suitable definition likely includes some of the criteria listed in the foreword to the PAC39 report, such as ability to deliver a result on a short timescale, the worldwide scientific environment of the field, or the ability to stimulate the interest of communities outside nuclear physics.

But apart from such early running considerations, the sheer size of the backlog makes it ever more difficult to justify adding to it without some mechanism for re-evaluation. The first 12 GeV proposals were approved at PAC30, held in mid-2006. Seven years of approvals have led to a seven year backlog, and we currently lack a good overview of the balance between subfields: of how many non-concurrent PAC days are allocated to each topic and of the timescale on which those experiments can run.

PAC40 continued the monotonic growth of the program. Every subsequent PAC will too until the start of the 12 GeV "jeopardy clock", which is undecided but no doubt some years away. We are aware that some physics areas are, most likely, disproportionately represented, but we tried to maintain consistency with previous decisions and long-standing programmatic priorities. We look forward to the forthcoming review meeting to impose some "20,000 foot" structure on our growing accretion disc of decisions.

# Introduction

The Jefferson Lab Program Advisory Committee held its 40th meeting from June 17th through June 21nd, 2013. The membership of the committee is given in Appendix A. In response to the charge (Appendix B) from the JLab Director, Dr. Hugh Montgomery, the committee reviewed 13 potential experiments: 13 new proposals, 4 Letters of Intent and 1 conditionally approved.

In addition the PAC held discussions regarding reassessment of scientific priorities prior to the beginning of full 12 GeV production running.

# Recommendations

## PAC 40 SUMMARY OF RECOMMENDATIONS

| NUMBER | CONTACT PERSON | TITLE | HALL | DAYS REQUESTED | DAYS AWARDED | SCIENTIFIC RATE | PAC DECISION | TOPIC* |
|---|---|---|---|---|---|---|---|---|
| PR12-13-001 | Simona Malace | Precision Measurements and Studies of a Possible Nuclear Dependence of R | C | 34 | | | Deferred | 3/5 |
| PR12-13-002 | John LeRose | A Study with High Precision on the Electro-production of the Lambda and Lambda-Hypernuclei in the Full Mass Range | A | 105 | | | Deferred | 5 |
| PR12-13-003 | Curtis A. Meyer | An initial study of hadron decays to strange final states with GlueX in Hall D | D | 200 | 200 | A | Approved | 1 |
| PR12-13-004 | Liping Gan | Symmetry Tests of Rare Eta Decays to All-Neutral Final States: The JLab Eta Factory (JEF) Experiment | D | 136 | | | Deferred | 6 |
| PR12-13-005 | Claudio Ugalde | Measurement of 16O(γ,α)12C with a bubble chamber and a bremsstrahlung beam | Inj | 14 | 14 | A- | Approved | 5 |
| PR12-13-007 | R. Ent | Measurement of Semi-Inclusive π° Production as Validation of Factorization | C | 25 | 25 | A- | Approved | 3 |
| PR12-13-008 | Rory Miskimen | Measuring the Charged Pion Polarizability in the γ γ→π+π- Reaction | D | 25 | 25 | A- | Approved | 2 |
| PR12-13-009 | Bogdan Wojtsekhowski | Wide-angle Compton scattering at 8 and 10 GeV photon energies | C | 42 | | | Deferred | 4G |
| PR12-13-010 | Carlos Munoz Camacho | Exclusive Deeply Virtual Compton and Neutral Pion Cross-Section Measurements in Hall C | C | 65 | 53 | A | Approved | 4G |
| PR12-13-011 | Karl Slifer | The Deuteron Tensor Structure Function b1 | C | 30 | 30 | A- | C1 | 3/5 |
| PR12-13-012 | Lawrence Weinstein | Nucleon Momentum Distributions in Asymmetric Nuclei A Comparison of 3He(e, e2p) and 3H(e, e2p) | A | 32 | | | Deferred | 5 |
| C12-12-004 | Seamus Riordan | CREX: Parity-Violating Measurement of the Weak Charge Distributing of $^{48}$Ca to 0.02 fm Accuracy | A | 45 | 45 | A- | Approved | 5 |

**Topic***

1 The Hadron Spectra as Probes of QCD
2 The Transverse Structure of the Hadrons
3 The Longitudinal Structure of the Hadrons
4 The 3D Structure of the Hadrons
5 Hadrons and Cold Nuclear Matter
6 Low-Energy Tests of the Standard Model and Fundamental Symmetries

C1=Conditionally Approve w/Technical Review
C2=Conditionally Approve 2/PAC Review

# Proposal Reports

**Proposal: PR12-13-001** **Scientific Rating: n/a**
**Recommendation: Defer**

**Title: Precision Measurements and Studies of a Possible Nuclear dependence of R**

**Spokespersons:** Eric Christy, Dave Gaskell, Cynthia Keppel, Simona Malace

**Motivation:**
The main goal is to measure with unprecedented statistical precision inclusive inelastic electron-nucleon and electron-nucleus scattering cross sections in the DIS regime spanning a four-momentum transfer range of $1 < Q2 < 5$ GeV $^2$, and Bjorken x range from $0.1 < x < 0.6$ for $W^2$ up to 10 $GeV^2$ using hydrogen, deuterium, beryllium, carbon, copper, silver and gold targets. The cross sections are used to perform on the ratio A/D high-precision Rosenbluth separations to extract the $R_A - R_D$, for longitudinal to transverse polarized photon cross section ratios. In addition, individual R and the transverse $F_1$, longitudinal $F_L$, and $F_2$ structure functions in a model-independent fashion will be determined. Existing measurements on nuclear dependences of R are imprecise, but might contain hints of an A-dependence. Precision data may add to understanding the origins of both anti-shadowing and the nuclear EMC effect.

**Measurement and Feasibility:**
Proposed experiment is located in hall C and will use HMS and SHMS. It requires 4 cm liquid H and D targets and several 2% radiation length solid targets. Data taking at 6 beam energies, including 2 non-standard energies is required. Beam current range from 10-80 microA. There appear to be no major technical challenges in the setup. Total beam time request is 34 days, including 20 days of running, with the remaining time used for configuration changes and special tests.

**Issues:**
The program is quite broad; the difference in R between nuclear targets can be zero; all corrections have to be very well controlled. In the case in which no nuclear dependence is observed, fewer nuclear targets (light and heavy) might be adequate. Optimizing the run plan to maximize an initial search for a non-zero measurement without engaging in a full program of study would be desirable as a first experiment, if possible. Explanation of the target selection and how much is gained by adding each of them will help in justification of beam time request. More discussion of theoretical motivations for this study would also be beneficial. In the proposal, several cross check measurements are foreseen (for example, pertaining to radiative and Coulomb corrections). Since the result from E140 depends on Coulomb corrections, it would be beneficial to have a full DWBA calculation compared with the approximation that is proposed. Selected configuration will allow studies of x and $Q^2$ dependences of measured quantity. Comparison with theoretical expectations would be useful.

**Proposal: PR12-13-002** **Scientific Rating:**
**Recommendation: Defer**

**Title: A study with high precision on the electro-production of the Λ and Λ-hypernuclei in the full mass range**

**Spokespersons**: F. Cusanno, F. Garibaldi, J.J. LeRose, P.E.C. Markowitz, S.N. Nakamura, J. Reinhold, L. Tang, and G.M. Urciuoli

**Motivation:**
The creation of hypernuclei through (e,e'$K^+$) experiments and measurement of their subsequent decay enables one to obtain indirect information on the Λ-N (two-body) or Λ-NN (three-body) interactions. A broad program of research starting from light nuclear systems and working towards heavier nuclei would also provide information on the influence of a strange particle on the nuclear medium. In the lighter systems, one could compare experimental data directly to theoretical few and many-body calculations based on well-motivated potentials, while in heavier systems the experiments would provide constraints on interactions used in mean-field or shell model calculations. Experiments of mirror hypernuclei would also be performed to elucidate charge-symmetry breaking aspects of the force. Heavy nuclei may also be used to investigate whether hyperons surrounded by nuclear matter would be able to maintain their character and this could have some connection to astrophysical environments where the nuclear densities may be 2-3 times that of nuclear matter. Studies of the production process would also complement larger angle studies that have been done in Hall B.

**Measurement and Feasibility:**
The proposal brings together experimental tools from Hall A and Hall C in a combined experimental setup that would occupy Hall A. The measurements are complementary to those that could be performed at JPARC or Mainz. They have a unique feature of being able to probe more neutron rich nuclear systems. Furthermore, (e,e'$K^+$) measurements enable the hyperon to be created anywhere in the nucleus, rather than just at the surface where hadronic probes can be used to great effect.

**Issues:**
The beam time required for the full program constituted about 100 days. A significant setup time for this experiment requires both resources and significant planning. The PAC felt that the case had not yet been made for such a significant investment, and would encourage, as PAC39 had done, that the proponents work closely with the theory community to identify the most important cases for study. A future proposal should also clearly state the impact of measurements for our understanding of the Λ-N interactions. A careful analysis of how these sets of measurements and their uncertainties constrain nuclear theory would be of value. A dedicated Workshop focused on these questions could be very helpful. The PAC needs to see a sense of priority from the proponents. This was missing in the current proposal and in the talks given to the PAC.

Since the Mainz program has not yet produced final results, we are also not in a position to comment on the backgrounds for decay-pion spectroscopy experiments. We believe this is also an important hurdle, as discussed by PAC39, to enable a positive decision for the program at JLab.

**Proposal: PR12-13-003** **Scientific Rating: A**
**Recommendation: Approved**

**Title: An initial study of mesons and baryons containing strange quark with GlueX**

**Spokesperson:** Curtis Meyer

**Motivation:**
This proposal is an extension of the already approved GlueX experiment on meson spectroscopy to include the detection and study of final state channels with open and hidden strangeness. The main motivation for such a study is the fact that a complete understanding of the hybrid meson spectrum requires a systematic amplitude analysis of many different hadronic final states, some of which include kaons. In addition cascade baryons are planned to be investigated.

**Measurement and Feasibility:**
The collaboration is planning to implement a level-three trigger which will be based on a new computing farm. With this upgraded setup they plan to collect 200 days of physics data at an average intensity of $5 \times 10^7$ tagged photons on target per second. This running will provide an increase in statistics of a factor 10 over the initial GlueX running. By means of detailed full simulations of several processes of interest containing strange mesons and hyperons the collaboration showed that this increase in statistics, coupled with a sophisticated multivariate analysis which uses the Boosted Decision Tree (BDT) algorithm, will result in a signal of $10^4$ events per 10 MeV/$c^2$ mass bin, while keeping the background contamination within 10 %. Thus the experiment will be able to carry out a significant exploratory study of final states containing kaons and hyperons using the baseline GlueX setup, in which kaon identification up to 2 GeV/c is provided by time-of-flight (in the forward wall); additional kaon identification is provided by TOF in the barrel calorimeter and dE/dx in the drift chamber. Furthermore, this increase in data volume will increase the sensitivity of GlueX to reactions that may have been statistically limited in the first phase.

**Issues:**
The PAC was impressed by the level of sophistication of the GlueX software and analysis which is essential for the achievement of a significant kaon and hyperon program even in the absence of dedicated hardware. Still the complete mapping of the spectrum of conventional and exotic hadrons will ultimately require the implementation of dedicated particle ID in the forward direction, extending the kaon identification capability to 10 GeV/c. The PAC therefore encourages the collaboration to move forward with the design of such system and aim at an early installation, if at all possible.

**Summary**:
GlueX is the flagship experiment in Hall D; the theoretical motivation for the proposed extension of running is very sound. The PAC recommends approval with the full allocation of the requested 200 days.

**Proposal: PR12-13-004** **Scientific Rating:**
**Recommendation: Defer**

**Title: Symmetry tests of rare eta decays to all-neutral final states: the JLAB eta factory experiment (JEF)**

**Spokesperson:** Liping Gan

**Motivation:**
The main goal of the experiment is to perform a study of dominant and rare eta decays photo-produced in Hall D. The eta is chosen as an attractive flavor-conserving system to search for new sources of C, P and CP violation which are vanishingly small in the standard model (SM). The three main channels to be investigated are $\eta \rightarrow 2\pi 0$ (test of P and CP), $\eta \rightarrow 3\gamma$ (test of C) and $\eta \rightarrow \pi 0\ 2\gamma$ (test of chiral perturbation theory). For the first two channels the plan is to improve the upper limits on the branching ratios by 1 –1.5 orders of magnitude. For the $\eta \rightarrow \pi 0\ 2\gamma$ decay the branching ratio will be determined with an accuracy of approximately 4%, improving on existing data.

**Measurement and Feasibility:**
The experiment is proposed to run in Hall D using the high-energy tagged photon facility with its planned 30 cm LH2 target, the GlueX detector and a new high-granularity, high-resolution PbWO forward calorimeter with flash ADC readout on every channel (FCAL-II). The desired performances in terms of reduced backgrounds and enhanced invariant mass resolutions will be achieved thanks to the new FCAL-II and to the fact that etas are produced significantly boosted. The proposed measurements appear to be feasible and the experiment is well suited for the tagged Hall D photon beam.

**Issues:**
The PAC recognizes the scientific interest of performing new measurements of rare eta decays with improved sensitivity to test the SM. However, the PAC identified some issues, mainly related to the theoretical implications of these measurements. For the SM forbidden decays more work should be done to identify physics scenarios which could imply branching ratios closer to the experimental sensitivities. The PAC suggests

that these issues be addressed in close collaboration with the theory community working in this field, which should be involved in helping strengthen the physics case. In addition, the projected results should be discussed in the context of similar or competing measurements at other facilities. Similar remarks apply to the impact the $\eta \rightarrow \pi 0\ 2\gamma$ decay (as well as the main background channel $\eta \rightarrow 3\pi 0$ which is offered as a means to constrain the light quark mass ratio from the slope of the Dalitz distribution) would have on chiral perturbation theory.

Finally, the PAC feels that the compatibilities and synergies with GlueX should be discussed in more detailed, in particular concerning the running configurations and the possibility of a staged running approach.

**Summary:**
The proposed experiment exploits the unique capabilities provided by Hall D to improve on the measurements of dominant and rare eta decay modes. However, in order to have a real impact the PAC feels that the issues raised above should be addressed by the collaboration before approval can be granted.

**Proposal: PR12-13-005** **Scientific Rating: A-**
**Recommendation: Approved**

**Title: Measurement of 16O(γ,α)12C with a bubble chamber and a bremsstrahlung beam**

**Spokespersons:** C. Ugalde (contact), R. Holt, R. Suleiman

**Motivation:**

In the field of nuclear astrophysics, the cross section for the low-energy $^{12}C(\alpha,\gamma)^{16}O$ is directly related to the carbon to oxygen ratio in stellar cores. Knowing this ratio has large implications for our understanding of stellar evolution as well as numerous issues in cosmological (e.g. Hubble constant). Although this reaction cannot be measured directly, it can be found by measuring the inverse photodisintegration reaction, $^{16}O(\gamma,\alpha)^{12}C$.

**Measurement and Feasibility:**
The experiment will use a novel approach employing bubble chamber technology. Alpha particles produced from a (γ,α) reaction would trigger a bubble that is detected by a camera. The chamber is relatively insensitive to gamma rays; hence very low cross sections can be determined. This technique has the capability to determine (α,γ) reaction rates at astrophysical energies if the backgrounds are low enough.

This proposal aims to measure the $^{16}O(\gamma,\alpha)^{12}C$ reaction at 7 energies with a bremsstrahlung beam ranging 7.9 to 8.5 MeV. The experiment will use a Penfold-Leiss decomposition to extract the energy dependence of the (γ,α) reaction rate. The collaboration has already performed preliminary measurements of the $^{19}F(\gamma,\alpha)^{15}N$ reaction using a bubble chamber at the HIGS facility. At JLAB the bubble chamber would not have the backgrounds observed at HIGS, because the photons are produced with low energy electron beams. Recent research and development on various bubble chamber liquids have been studied and indicate that $N_2O$ is the likely liquid to be used for the experiment, although other molecules are still under investigation. This proposal is a new, but follows from proposal PR12-12-013, which aimed to first study the $^{19}F(\gamma,\alpha)^{15}N$ reaction rate at Jlab, but was deferred by PAC39.

**Issues:**

The PAC strongly supports the measurement of $^{16}O(\gamma,\alpha)^{12}C$ at JLAB. The PAC views the present proposal as viable and encourages the collaboration to move forward with the measurement. Measurements of the reaction rate down to center-of-mass energies of 700 keV with uncertainties at the ~20% level represents a large improvement compared to what exists today and could potentially allow for an extrapolation down to low enough energies to be of astrophysical interest. If possible, this measurement could be groundbreaking for the astrophysical community.

The PAC has concerns that the beam-induced background and low energy resonances may be significant and hard to estimate. The specifications for the beam energy determination are also challenging and at the moment represent the largest systematic uncertainty.

The PAC strongly encourages that this experiment be scheduled in such a way so as not to impact the 12 GeV program. Overall, the PAC finds the proposed experiment a promising road towards determining the $^{12}C(\alpha,\gamma)^{16}O$ cross section. The PAC approves the experiment for the requested amount of 336 hours (i.e. 2 weeks).

**Proposal: PR12-13-007** **Scientific Rating: A-**
**Recommendation: Approved**

**Title: Measurement of Semi-Inclusive $\pi^0$ Production as Validation of Factorization**

**Spokespersons:** R. Ent, T. Horn, H. Mkrtchyan, V. Tadevosyan

**Motivation:**
The motivation of the proposed experiment is to measure the cross section for the semi-inclusive $\pi^0$ production off an unpolarized proton target, at small transverse momentum. It is a basic measurement, in a kinematical region where the QCD factorization scheme is expected to hold. The analysis of the multi-dimensional data in such a scheme, will improve our knowledge of transverse momentum dependent distribution and fragmentation functions (TMDs), and test the validity of the scheme itself, including TMD evolution. Similar analysis will be performed, with charged pions, by the approved E12-09-017 experiment. The detection of neutral pions is a new feature, with several experimental advantages with respect to charged ones. Assessing the confidence in using SIDIS factorization expressions to describe unpolarized cross section measurements an important step for further analysis of polarized TMDs.

**Measurement and Feasibility:**
This (e,e′$\pi^0$) experiment is proposed to be carried out in Hall C; the scattered electrons will be measured using the Hall C High-Momentum Spectrometer and the $\pi^0$ through the measurement of its $\gamma\gamma$ decay products in a dedicated neutral-pion spectrometer (NPS). The proposed NPS will be based on the technology using PbWO4 crystals that was well established by the HyCal calorimeter used in the PrimEx experiments. The expected precision of the cross section measurement is about 3%, comparable to that of the proposed charge pion production Experiment E12-09-017. The experiment can run in parallel with PR12-13-010. The proposed measurements are feasible.

**Issues:**
There are no major issues

**Recommendation:**
The PAC approves 25 days of beam time as requested.

**Proposal: PR12-13-008** **Scientific Rating: A-**
**Recommendation: Approved**

**Title: Measuring the Charged Pion Polarizability in the $\gamma\gamma \rightarrow \pi^+\pi^-$ Reaction**

**Spokespersons:** Rory Miskimen, Elton Smith, David Lawrence

**Motivation:**
The proposed experiment aims to extract the charged pion polarizability using the reaction $\gamma\gamma \rightarrow \pi^+ \pi^-$ in the low invariant mass $M\pi\pi$ domain. The goal is to measure this cross section with an accuracy of 1.5% in order to extract the combination $\alpha_\pi - \beta_\pi$, from the deviation of the cross section compared to the Born cross section. After a long controversy the recent dispersive approach (ref Pasquini 2008) reconciles the value of $\alpha_\pi - \beta_\pi$, given by this method to the CHPT prediction: $5.7 \times 10^{-4}$ fm$^3$.

The reanalysis of the MARK II $\gamma\gamma \rightarrow \pi^+ \pi^-$ reaction gives $\alpha_\pi - \beta_\pi = (4.4 \pm 3.2 \text{ (stat)}) \times 10^{-4}$ fm$^3$ while the radiative pion photoproduction (Mainz 2005) gives $\alpha_\pi - \beta_\pi = (11.6 \pm 1.5 \text{ (stat)} \pm 3.0 \text{ (syst)} \pm 0.5 \text{ (model)}) \times 10^{-4}$ fm$^3$ and the old Primakoff measurement (Serpukov 1983) gives $\alpha_\pi - \beta_\pi = (13.6 \pm 2.8 \text{ (stat)} \pm 2.4 \text{ (syst)}) \times 10^{-4}$ fm$^3$. The present proposed cross section measurement allows for a determination of $\alpha_\pi - \beta_\pi$ with an uncertainty of $0.6 \times 10^{-4}$ fm$^3$. This should make a clear statement on this fundamental observable providing an important test of low energy QCD.

**Measurement and Feasibility:**
The experiment requires a linearly polarized photon beam in Hall D but with a position of the coherent peak at 6 GeV and a solid target installed near the upstream entrance of the magnet. The two outgoing pions are intercepted by the GlueX detector.

The main backgrounds are given by the 2 pions from the rho photo-production obtained coherently and incoherently on the nucleus and by the production of $\mu^+ \mu^-$ or e+ e- pairs. The e+ e- pairs can be rejected by the energy deposition in the FCAL, while rejection of the $\mu^+ \mu^-$ pairs requires a new proposed muon detector. A clever method is used to reject the remaining backgrounds, based on the different azimuthal distributions obtained in polarized photo production and their evolution for different ranges in invariant mass $M\pi\pi$.

**Issues:**
This experiment requires non-standard equipment and running conditions for Hall D: the linearly polarized tagged photons at 6 GeV, a solid target and a new muon detector for which a conceptual design based on standard technology has been presented.

The signal needs to be isolated from large backgrounds while determining the efficiency at a level consistent with the aggressive attainment of small systematic uncertainties. A precise determination of the pion efficiency associated with the muon and electron background cuts is necessary, along with a precise determination of the absolute muon production cross section, which is used as a normalization for the primary measurement. Studies of other backgrounds, e.g. coherent production, should be continued.

**Recommendation:**
The PAC approves 25 days of beam time for this proposal with a scientific rating of A-.

**Proposal: PR12-13-009** **Scientific Rating:**
**Recommendation: Defer**

**Title: Wide-angle Compton scattering at 8 and 10 GeV photon energies**

**Spokespersons:** D.J. Hamilton, S. Sirca, B. Wojtsekhowski

**Motivation:**
This proposal aims to measure the cross section for real Compton scattering from the proton at an incident photon energy of 8 GeV and 10 GeV (corresponding to a value of s = 15.9 and 19.6 $(GeV/c)^2$, respectively) at wide c.m. scattering angles (in the range between 40 deg and 120 deg). Previous 6 GeV JLab polarization transfer data have shown a clear indication for a partonic mechanism in the wide-angle Compton Scattering (WACS) process. These data have shown that wide angle Compton scattering takes place on a single quark, in contrast to the perturbative QCD picture which involves three active quarks exchanging two hard gluons. Whether such a quark is embedded in the nucleon and understanding the role of factorization between the partonic subprocess are still open questions, motivating cross section measurements at large s and t. The present experiment aims to extend the kinematic range of previous JLab WACS experiments by a factor of 2.

**Measurement and Feasibility:**
This experiment is proposed to be performed in Hall C, using an untagged bremsstrahlung photon beam incident on a liquid hydrogen target. The scattered photon are detected in a newly proposed neutral particle detector (NPS) for Hall C. The scattered electrons from the electron beam pass through a liquid hydrogen target, with the scattered electron deflected by a sweeping magnet to allow for discrimination between Compton and elastic electron scattering processes. To ensure the exclusivity of the reaction, the recoil proton will be detected in the Hall C magnetic spectrometer HMS. The experimenters request 1000 hours of beam time.

**Issues:**
The main background to the WACS process is due to the much larger $\pi^0$ production process, when one of the decay photons goes undetected. The authors have shown the feasibility of this background subtraction for some settings. Given its crucial importance, the PAC40 would have liked to see a realistic simulation for the background subtraction for each kinematic setting, to avoid the beamtime request from becoming prohibitively large.

Furthermore, the PAC was also not convinced on the choice of kinematic points to make the strongest physics case. To perform the above mentioned factorization study, the PAC felt that it would be more promising to focus on a fixed intermediate value of –t, combining the s-range from the previous 6 GeV experiment with the proposed extension in s. Several theoretical model approaches have been presented to interpret the result of such WACS cross sections. To interpret a factorization of the s- and t-dependence, the PAC would also like to see a sharpened physics case, indicating how such data would lead to systematic improvements within the specific models.

**Recommendation:** Deferred
The PAC40 sees a strong potential for the WACS to be a process of choice to explore factorization in a whole class of wide-angle processes. However, the PAC was not convinced that in the present proposal both the $\pi^0$ subtraction procedure crucial to extract the WACS cross sections as well as the physics case were optimized.

**Proposal: PR12-13-010** **Scientific Rating: A**
**Recommendation: Approved**

**Title: Exclusive Deeply Virtual Compton and Neutral Pion Cross Section Measurements in Hall C**

**Spokespersons:** C. Munoz Camacho, R. Paremuzyan, T. Horn, J. Roche, Charles Hyde

**Motivation:**
Generalized Parton Distributions (GPDs) provide an unprecedented means to describe nucleon structure allowing for a nucleon as a 3-dimensional object. The GPD program is still at the heart of the scientific motivation of the 12 GeV upgrade of JLab. Deeply virtual Compton scattering is the cleanest or golden channel to study GPDs. As the DVCS process interferes with the Bethe-Heitler process, one can access the DVCS amplitudes. At *leading twist* and *leading order*, one determines Compton form factors, CFF, which are integrals of GPDs over x with a kernel to describe the hard photon-quark interaction. Present analyses assume dominance of several GPDs, validity of twist-2 dominance, and a leading order formalism. The GPD program at JLab with 12 GeV has the ambition to go beyond these analyses. The primary goals of the different DVCS experiments at JLab with 12 GeV reflect the complementarity between the different Halls :

1) A measurement of beam spin asymmetries and cross sections in Hall A (PR12-06-114) will provide a precision test of scaling for selected kinematical points.

2) A survey over a wide kinematic range of unpolarized and polarized DVCS observables will be performed in Hall B (PR12-06-119) to provide an unprecedented DVCS data set.

3) The present experiment will be in the unique position, using the spectrometer capability in Hall C, to provide a precision measurement of the cross section ($\sigma(ep \rightarrow ep\gamma) = \sigma^{BH} + \sigma^{DVCS}$ + Interference) at *different beam energies* in order to perform an L/T separation. This will allow for disentangling the DVCS cross section $\sigma^{DVCS}$ from the interference term (after subtracting the known Bethe-Heitler contribution). The analysis of the azimuthal angular distributions will then for a determination of the real part of the Compton form factor *without any assumptions*.

**Measurement and Feasibility:**
This experiment will be performed in Hall C, using a 5-50μA electron beam incident on a liquid hydrogen target. Different beam energies (E=6.6, 8.8, 11 GeV) are required. The scattered electron is detected in the well-known high resolution HMS spectrometer while the photon is intercepted in the newly proposed Neutral Particle Spectrometer (NPS) cantilevered off the SHMS carriage and remotely rotatable from 5.5° up to 30°.

The NPS would consist of 1116 PbWO4 blocks (similar to the PRIMEX experimental setup), comprising a 25msr device at a distance of 4 m. The PbWO4 blocks would be equipped with new PMT bases (with preamplifiers to operate at lower voltage and lower anode currents) to cope with the high rates and flash ADCs to perform offline shape analysis. The NPS detector will be positioned at 4 or 3 or 6 m meters allowing a full azimuthal coverage at small transfer *t* and a good separation for the 2 decay photons of $\pi^0$. Specific actions will be taken to reduce the backgrounds:

1- The Horizontal-Bend Magnet of the SHMS would be removed to install a 0.3 T.m sweeping magnet (to remove Möller electrons).

2- A dedicated beam pipe with as large critical angle as possible and shielding are foreseen to reduce backgrounds beyond the sweeping magnet.

The use of PbWO4 blocks (instead of PbF2 blocks in Hall A) provides a better resolution in the missing mass for H(e,e'γ) X events to minimize the non-exclusive background.

**Issues:**
The PAC is concerned by the 5 and 12 days to study the scaling at high x and high Q2 (two last kinematical points of the Table III in the proposal). The scaling will already be studied in the first Hall A experiment Hall A (PR12-06-114) and the very small gain does not justify the large beamtime request. The PAC recommends to abandon these two points and to use 5 of these days to improve the quality of the L/T separation at x=0.36 and $Q^2$ =3 $GeV^2$ , using the unique setup of the Hall C . This will allow for a complete separation using Hall C data, in order to have the optimal control of the systematics. The PAC approves this experiment for 53 days.

**Recommendation: approved for 53 days**

**Proposal: PR12-13-011** **Scientific Rating: A-**
**Recommendation: Conditional Approval (C1)**

**Title: b1: The Deuteron Tensor Structure Function b1**

**Spokespersons:** J.-P. Chen, P. Solvignon, O. Rondon Aramayo, D. Keller, N. Kalantarians, E. Long, K. Slifer

**Motivation:**
This proposal, a follow-up of PR12-11-110 submitted to PAC38, is dedicated to the measurement of the deuteron tensor structure function $b_1$ by measuring deep inelastic scattering from a tensor polarized deuterium target. All available conventional models predict a small or vanishing value of $b_1$ at moderate x, however the first pioneering measurement of $b_1$ at HERMES revealed a potentially anomalously large negative value at x = 0.45, albeit with a relatively large experimental uncertainty. The goal is to make a precise measurement: if $b_1$ is found to be relatively large, explanations based on more exotic models for the deuteron, such as hidden color due to a 6-quark configuration would become fashionable.

**Measurement and Feasibility:**
The collaboration proposes to carry out the experiment in Hall C, using the dynamically polarized JLab/UVa $ND_3$ target operated in longitudinal mode, the HMS/SHMS spectrometers and an unpolarized 115 nA electron beam at 11 GeV. The tensor structure function $b_1$ is derived from the measurement of the tensor asymmetry $A_{zz}$ obtained from the ratio of tensor polarized and unpolarized cross-sections, which is directly proportional to $b_1$ itself and the leading-twist structure function $F_1$. A precision measurement requires a beam stability control at a $10^{-4}$ level to avoid false asymmetries. The collaboration proposes to perform the measurement in 30 days of data taking at four x values between 0.15 and 0.5, which cover the range in which the HERMES data display the crossover of $b_1$ to large negative values. The experimental overhead for calibrations and target polarization cycles amounts to 11 days.

**Issues:**
In order to obtain conclusive data with sufficient precision it is crucial to achieve a tensor polarization significantly higher than the value of 20% assumed in the proposal. While methods such as RF- “hole burning” are known to increase the tensor polarization above the thermal equilibrium value, these techniques including the polarization measurement have to be developed further to allow for a reliable operation under experimental conditions.

**Conditions:**
The experiment is conditionally approved with the condition that a tensor polarization of at least 30% be achieved and reliably demonstrated under experimental conditions.

**Proposal: PR12-13-012** **Scientific Rating:**
**Recommendation: Defer**

**Title: Nucleon Momentum Distributions in Asymmetric Nuclei A Comparison of 3He(e,e'p) and 3H(e,e'p)**

**Spokespersons:** L.B. Weinstein, O. Hen, W. Boeglin, S. Gilad

**Motivation:**
The proposed experiment aims to measure the proton momentum distribution in 3H and 3He through a study of A(e,e'p) measurements on 3H and 3He. Through isospin symmetry, this can be related to the proton and neutron momentum distributions in 3He. The experiment will also investigate the ratio of $^3$He(e,e'p)/$^3$H(e,e'p) as a function of the missing momentum up to a value of about 500 MeV/c. This ratio is expected to change qualitatively from about 2 at low missing momentum to 1 at moderately high missing momentum due to short-range correlation, and then increases again to 2 where all three nucleons have high missing momenta. The proposed experiment would also investigate the ratios of $^3$He(e,e'p) and $^3$H(e,e'p) to that of d(e,e'p) and compare with theoretical calculations.

**Measurement and Feasibility:**
The experiment is proposed to be carried out in Hall A using the Marathon tritium, deuterium and $^3$He gas targets, and the two HRS spectrometers. The proposed kinematics were chosen to minimize final state interactions based on theoretical calculations as well as existing data from the d(e,e'p) process. In addition to ratios of $^3$He(e,e'p)/$^3$H(e,e'p), $^3$He(e,e'p)/d(e,e'p), and $^3$H(e,e'p)/d(e,e'p), absolute cross sections would be determined from the proposed experiment and be compared with theoretical predictions. The proposed measurements are feasible, and there are no technical issues of concern with the assumption that the tritium target will be ready before this experiment.

**Issues:**
There do not appear to be any experimental issues with the proposed measurements. The proposed measurements focus on the ratio of $^3$He(e,e'p)/$^3$H(e,e'p) as a function of the missing momentum, going from low-$p_m$ values, sensitive to mean field properties, to high-$p_m$ values, sensitive to short-range correlations (SRCs). This allows for studies of the mean field region, the SRC-dominated region, and the transition between the two.

**Recommendation: Defer**
While the proposed measurements cover a significant range in missing momentum, most of the discussion of what will be learned is focused on the SRC-dominated region. In this region, it is not clear what this measurement adds quantitatively to what one already knows indirectly from previous measurements and planned measurements. The proponents are encouraged to further develop the physics case presented in the proposal, for example, what will be the impact of the proposed experiment on few-body systems, the origin of the EMC effect, and the asymmetry energy term on the neutron star equation of state? The proponents are also encouraged to present the physics case for what can be learned in the comparison at low missing momenta and the transition regions based on EFTs and other detailed nuclear structure calculations. Since measurements for $^2$H, $^3$He, and $^4$He can be used to test detailed calculations, an emphasis on the importance of the $^3$H-$^3$He comparison needs to be made more clearly.

**Proposal: C12-12-004** **Scientific Rating: A-**
**Recommendation: Approved**

**Title: C-REX: Measurements of the Neutron Radius of 48Ca**

**Spokespersons:** S. Riordan (contact), J. Mammei, R. Michaels, K. Paschke, P. Souder, D McNulty

**Motivation:**
The experiment aims to measure the neutron skin, i.e. the difference of the neutron and proton radii, of 48Ca in parity-violating electron-scattering mediated by the weak charge of the nucleus. The neutron skin is a key observable that is predicted by nuclear models, but normally is not precisely determined experimentally. It would test and constrain theoretical calculations of isovector properties of nuclei, elucidate the role of 3-nucleon interactions, and provide a benchmark and a key test for many nuclear models. This experiment is three times more precise than the PREX-II experiment that was approved by PAC 38. In tandem with PREX-II, it would have implications for such diverse fields as astrophysics and experiments in atomic parity violation.

**Measurement and Feasibility:**
The asymmetry for single polarized electron scattering at a fixed Q2 is a measure of the ratio of the weak to Coulomb form factors and hence is sensitive to the neutron radius of the nucleus since the weak charge of the proton is small compared to that of the neutron. A 45-day experiment is expected to determine the size of the neutron distribution in 48Ca to 0.02 fm. It is proposed to run at 2.2 GeV in order to optimize the kinematic conditions to make the measurement most sensitive to the neutron size. A new septum magnet is needed for the higher energy electron beam used in CREX compared to PREX and a smaller scattering angle. Otherwise the setup is the same. The proposal included simulations that demonstrate that the radiation damage will be less than the PREX experiment and hence once PREX-II is run, this experiment will be demonstrated to be feasible provided the potential target issues are overcome. The target can be tested using natural calcium at the time of the PREX-II experiment.

**Issues:**
The proposal is a resubmission of PR12-12-004 which was conditionally approved by PAC 39. The main question raised was on the motivation of the PREX-II measurement with another nucleus. Approval of the CREX experiment was conditioned on a convincing case being made regarding its impact on microscopic model calculations. In response to this, the collaboration initiated a theory workshop addressing these issues. The nuclear theory community expressed enthusiasm to perform such a measurement, and it was concluded that it may confirm the theoretical expectation of a fairly strong correlation between the 48Ca and 208Pb neutron skins, test coupled cluster calculations which are currently performed for 48Ca, and constrain density functional theories applicable to a large range of nuclei. The current PAC is satisfied with the physics case presented. A second, minor point was that the collaboration should use the complete design of the septum magnets to simulate acceptance and track reconstruction in detail. Such simulations based on transport functions have also been provided. There are no further major issues.

**Recommendation:**
The PAC approves the experiment for the requested amount of 45 days.

# Letters of Intent

**Letter of Intent: LOI-12-13-001**

**Title: Timelike Compton Scattering in e+e- pair production on the proton with SoLID at 11 GeV**

**Spokespersons:** P. Nadel-Turonski, Z.W. Zhao

**Motivation:**
The primary aim of this Letter of Intent is to measure the $\gamma$ p -> e+ e- p process (timelike Compton scattering, TCS) in the e+e- mass region between the $\rho$' and the J/$\psi$ mesons. This reaction is complementary to the deeply virtual Compton scattering (DVCS), providing a novel access to Generalized Parton Distributions (GPDs). Using unpolarized photons, the real part of the interference with the well known Bethe-Heitler mechanism accesses the subtraction constant in a dispersion formalism for DVCS. Such measurement is equivalent to a charge asymmetry measurement (using e+ and e- beams) in DVCS. A comparison of both DVCS and TCS will allow for a test of the universality of GPDs (analogous to comparing the DIS and Drell-Yan processes). The proposed experiment aims to be complementary to the CLAS12 experiment (E12-12-001). The latter will provide a wider kinematic coverage, whereas the present experiment aims at a higher precision.

**Measurement and Feasibility:**
The experiment will use the SoLID detector, an 11 GeV highly polarized electron beam, and an unpolarized hydrogen $LH_2$ target. The initial electron will be scattered at nearly 0deg, escaping detection, so as to yield an initial quasi-real photon. The produced lepton pair ID will be achieved by both the Cherenkov counters as well as the EM calorimeters. The proton ID will be performed using TOF. The exclusivity of the reaction will be achieved by missing mass (ensuring that a very forward scattered electron in quasi-real electroproduction can be distinguished from an electron that radiates a photon in photoproduction). The proponents request 50 days of beam time.

**Issues:**
The main issue which the PAC sees at this point is the physics case. As the TCS experiments will not achieve the same precision as their spacelike counterparts, the proponents did not make a convincing enough case for a precision measurement, beyond the already approved survey over a wide kinematic range. It was not demonstrated how the extracted Compton Form Factors (CFF) from TCS will complement the CFF from the spacelike DVCS program in a significant way.

**Recommendation:**
Although the PAC was not convinced at this point that the precision achieved by the present experiment will impact the results from the more straightforward and already approved spacelike DVCS program, it may be of interest to explore if the present experiment could be part of a larger run group within SoLID.

**Letter of Intent: LOI-12-13-002**

**Title: LOI SOLID IFF-$^3$He(T): Dihadron Electroproduction in DIS with Transversely Polarized $^3$He Target at 11 and 8.8 GeV**

**Spokesperson:** J. Zhang

**Motivation:**
The proponents of this LOI would like to measure the single target spin asymmetry (SSA) of dihadron production in the deep inelastic scattering (DIS) of electrons off polarized neutrons. Such a measurement would offer information on the convolution of the transversity distribution with the dihadron fragmentation function. The latter is known from independent $e^+e^-$ measurements at Belle. New information on the neutron transversity distribution can then be obtained. This information, coupled to the results of a similar experiments off a proton target (PR12-12-009, C1 conditionally approved), would allow a flavor separation of the transversity distributions.

**Measurement and Feasibility:**
The experiment would use 11 and 8.8 electrons on a transversely polarized $^3$He target in Hall A. It would run in parallel with the approved E12-10-006 experiment (run group). There appears to be no problem to schedule such an experiment.

**Issues:**
Some concerns about higher order corrections in the theoretical approach described in the LOI, have been clarified.

**Recommendation:**
The PAC does encourage the proponents to submit a proposal.

**Letter of Intent: LOI-12-13-003**

**Title: Large Center of Mass Angle, Exclusive photoproduction of $\pi^0$ mesons at Photon Energies of 5-11 GeV**

**Spokespersons:** D. Dutta, H. Gao and S. Sirca

**Motivation:**

The letter proposes to study the $\pi^0$ production at large energy and large angle. This reaction is one of the simplest probes of the transition from meson-nucleon degrees of freedom to quark-gluon degrees of freedom in exclusive processes. This would allow studying pQCD scaling, validity of the "hand-bag" mechanism and soft-hard factorization. This measurement will also provide detailed investigation of the possible oscillatory scaling behavior around the (generalized) quark counting rule prediction.

**Measurement and Feasibility:**

The proposed measurement will be carried out in Hall C using an electron beam impinging on a 6% copper radiator and a liquid hydrogen target. The recoil proton will be detected in the HMS spectrometer and the two photons of $\pi^0$ decay will be detected in the new proposed Neutral Particle Spectrometer (NPS). The scattered electron will be deflected using a sweeping magnet. This setup is the same as the one proposed for the Real Compton Scattering (RCS), experiment PR12-13-009, except the position of the NPS which is further to intercept the two decay photons with the best acceptance.

A beam time of 500 hours based on estimations of the NPS efficiency would allow to measure $d\sigma/dt$ at 90° CM for 12 values of $\sqrt{s}$ varying between 3.2 and 4.6 GeV.

**Issues:**

The Pac recognizes this exploratory physics at a still too premature stage. The physics motivations should be sharpened and the expected results should be supported by solid theoretical predictions.

**Recommendation:**

The proponents of this letter of intent and of the proposed experiment PR12-13-009 are strongly encouraged to join their effort to study the RCS at large angle with a perfect evaluation of the $\pi^0$ background. This would provide a first estimation of the $\pi^0$ production at large angle.

**Letter of Intent: LOI-12-13-004**

**Title: Measurements of the charge and magnetic form factors of the triton at large momentum transfers**

**Spokespersons:** A. Camsonne, A. T. Katramatou, G.G. Petratos (contact), N. Sparveris

**Motivation:**
The letter of intent proposes to carry out cross section measurements from elastic-triton scattering and perform Rosenbluth separation to determine the charge and magnetic form factors of triton with precision up to a large four-momentum transfer squared value of about 50 $fm^{-2}$. These proposed measurements together with data from JLab on the $^3$He charge and magnetic form factors in similar four-momentum transfer squared region will complete the picture for three-body systems, and allow for the separation of the isoscaler and isovector contributions to these form factors. As such they will provide sensitive tests of the state-of-the-art three-body calculations, and further advance our knowledge about the few-body systems. The proposed elastic form factor measurements of triton are therefore very important.

**Measurement and Feasibility:**
The experiment can be performed in the JLab Hall A Facility using the two High Resolution Spectrometers, the BigBite Spectrometer, and a tritium target that is under construction for other approved 12-GeV experiments already. The proposed measurements seems to be feasible with the assumption that the tritium target will be ready before this experiment, and the available information given in this letter of intent.

**Issues:**

(1) The LOI proposes to extract the triton charge and magnetic form factors using the technique of Rosenbluth separation using cross section data at two (forward and backward) electron scattering angles for each value of $Q^2$. It will be important to study carefully the systematic uncertainties associated with carrying out the Rosenbluth method with only two data points.

(2) At forward angles, the left HRS will detect electrons in coincidence with recoil tritons being detected in the BigBite spectrometer. For backward angle case, both spectrometers (HRS) will be used to detect recoil nuclei. A reliable particle identification of recoiling tritons is important for the proposed measurements, and simulations are needed to establish this.

(3) Whether or not two-photon exchange corrections will have any impact on the extraction of the form factors from these measurements needs to be discussed.

**Recommendation:**
Given the importance of the proposed measurements, we encourage the proponents to address these issues, and move forward with the development of a full proposal for a review by a future PAC.

# Parallel Proposal

**Proposal: PR12-12-008**

**Title: "** Photoproduction of the Very Strangest Baryons on a Proton Target in CLAS 12 **"**

**Spokespersons:** Lei Guo, Michael Dugger, Eugene Pasyuk, Igor Strakovsky,
Dan Watts, Veronique Ziegler

**Motivation:** The proposal is aiming at a study of cascade and omega baryons in exclusive photoproduction reactions with the CLAS12 detector. Comprehensive measurements of cross sections as well as measurements of the beam polarization transfer/induced polarization are planned. These measurements allow the search for new and missing states in the spectrum of cascade baryons about which only very little is known presently. Mass splittings of the ground and excited states cascades will be measured and it is aimed at a determination of the quantum numbers of the states. Another ultimate goal of the proposal is to shed light on the production mechanism of the S=-2 and S=-3 baryons, being produced from an initial state without a priory existing valence s-quarks.

**Measurement and Feasibility:** The proposed experiment will run in parallel with already approved experiments including the CLAS12 meson spectroscopy experiment (E12-11-005). It is expected to yield ~4000 Omega and several millions Cascade baryons. These estimates are for the expected cross sections based on model assumptions combined with existing data for and on fast Monte Carlo simulations with parametrized detector response and a background simulation using Pythia. Compared to the last PAC kaon identification has been studied in significantly more detail within the simulations, unfortunately a full simulation and reconstruction for the CLAS 12 setup is not yet available.

**Issues:** This proposal does not require additional time or equipment with respect to already approved CLAS12 beamtimes. One issue is how well the quantum numbers of a possible newly observed exited Cascade state could be determined, given the covered multidimensional phasespace, acceptance, backgrounds and reaction dynamics. This was not yet studied in detail.

**Summary**: The motivation of the proposed measurement is sound and it fits very well within the physics interest of the 12 GeV run. This to a certain extent exploratory measurement might be the first step towards a S=-2 and S=-3 baryon spectroscopy program at CLAS 12.

Since this experiment will run parallel with experiment E12-11-005 the new number assigned to it is E12-11-005a.

# Program Status

## 12 GeV Approved Experiments by Physics Topics

| Topic | Hall A | Hall B | Hall C | Hall D | Other | Total |
|---|---|---|---|---|---|---|
| The Hadron spectra as probes of QCD (GluEx and heavy baryon and meson spectroscopy) | | 1 | | 2 | | **3** |
| The transverse structure of the hadrons (Elastic and transition Form Factors) | 4 | 3 | 2 | 1 | | **10** |
| The longitudinal structure of the hadrons (Unpolarized and polarized parton distribution functions) | 2 | 2 | 6 | | | **10** |
| The 3D structure of the hadrons (Generalized Parton Distributions and Transverse Momentum Distributions) | 5 | 10 | 4 | | | **19** |
| Hadrons and cold nuclear matter (Medium modification of the nucleons, quark hadronization, N-N correlations, hypernuclear spectroscopy, few-body experiments) | 4 | 2 | 6 | | 1 | **13** |
| Low-energy tests of the Standard Model and Fundamental Symmetries | 2 | | | 1 | 1 | **4** |
| **TOTAL** | **17** | **18** | **18** | **4** | **2** | **59** |

## 12 GeV Approved Experiments by PAC Days

| Topic | Hall A | Hall B | Hall C | Hall D | Other | Total |
|---|---|---|---|---|---|---|
| The Hadron spectra as probes of QCD (GluEx and heavy baryon and meson spectroscopy) | | 119 | | 320 | | **439** |
| The transverse structure of the hadrons (Elastic and transition Form Factors) | 144 | 85 | 102 | 25 | | **356** |
| The longitudinal structure of the hadrons (Unpolarized and polarized parton distribution functions) | 65 | 120 | 165 | | | **350** |
| The 3D structure of the hadrons (Generalized Parton Distributions and Transverse Momentum Distributions) | 409 | 982 | 161 | | | **1552** |
| Hadrons and cold nuclear matter (Medium modification of the nucleons, quark hadronization, N-N correlations, hypernuclear spectroscopy, few-body experiments) | 159 | 120 | 179 | | 14 | **472** |
| Low-energy tests of the Standard Model and Fundamental Symmetries | 513 | | | 79 | 60 | **652** |
| **TOTAL** | **1290** | **1426** | 607 | 424 | **74** | **3821** |

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# Charge to PAC40

1.) Review new proposals, previously conditionally approved proposals, and letters of intent. Letters of intent will be given the same "rights" to their scientific ideas as are currently afforded to deferred experiments 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 with high-quality physics 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 beamtime 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.

2.) Given the current (and growing) backlog of approved experiments, we anticipate that it will be necessary to readdress priorities for scheduling the program at the beginning of the 12 GeV running period. The PAC should continue the discussion of implementation of the reprioritization (Wed. afternoon) in order to establish the highest impact program possible with the 12 GeV facilities. We request that the PAC provide comments on the proposed procedure to be followed.

† Letters of intent will be given the same "rights" to their scientific ideas as are currently afforded to deferred experiments