GHP Newsletter June 2008

American Physical Society Topical Group on Hadron Physics

http://www.aps.org/units/ghp/

Executive Officers

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cmeyer@cmu.edu	wroberts@fsu.edu	sjbth@slac.stanford.edu	cdroberts@anl.gov

Secretary/Treasurer	*Members at Large*	
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NB. EMail addressed to ghpexec@anl.gov will reach all members of the Executive.

Contents

1 Elections

Elections for three posts in the GHP Executive closed early in 2008. The new Executive Committee is listed at the top of this newsletter.

On behalf of GHP, the Executive thanks the people who entered their names on the ballots.

In addition, we thank Dave Tedeschi and Ed Kinney for their service to GHP.

Elections will open again this year in early-November. We will fill two positions on GHP's Executive Committee:

- Vice-Chair (Winston Roberts will become Chair and Stan Brodsky, Chair-Elect, leaving

the position of Vice-Chair vacant. Naturally, Curtis Meyer will become Past-Chair and Craig Roberts will die and go to heaven.)

- and one Member-at-Large (Paul Eugenio will by then have completed his stint.)

In October, the Nominating Committee will solicit input from the GHP membership. The nomination of candidates will close on Fri., 24 October and an electronic ballot will subsequently be held over a four week period: 3 November – 1 December.

The 2008 Nominating Committee is

2008 Nominating Committee

Paul Eugenio	Haiyan Gao	Craig Roberts	Raju Venugopalan
eugenio@fsu.edu	gao@phy.duke.edu	cdroberts@anl.gov	raju@quark.phy.bnl.gov

Craig Roberts is Chair. We urge GHP members now to begin considering whom they would like to see filling the two open positions in 2008 and encourage members with ideas to contact someone in the Committee and pass on their suggestions.

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2 Fellowship

We take this opportunity to congratulate *Sebastian Kuhn*, (Old Dominion University), and *Winston Roberts*, (FSU), both of whom were elected in 2007 to Fellowship in the APS, Sebastian under the auspices of the GHP:
Sebastian "For his leadership on measurements of the nucleon structure functions, in particular in the non-perturbative and valence region;"
and Winston "For significant contributions to hadron physics using models of QCD as well as effective field theories and phenomenological Lagrangians, for the development of polarization observables in photoproduced three-body final states, and for continued service to the nuclear science community.

This is a good opportunity to remind the GHP that each year the APS allocates a number of Fellowship Nominations to a Topical Group. That number is based primarily on membership. A strong GHP can nominate more of our members for Fellowship. This year we are allocated ONE Regular nomination and ONE Alternate, for a total of TWO nominations.

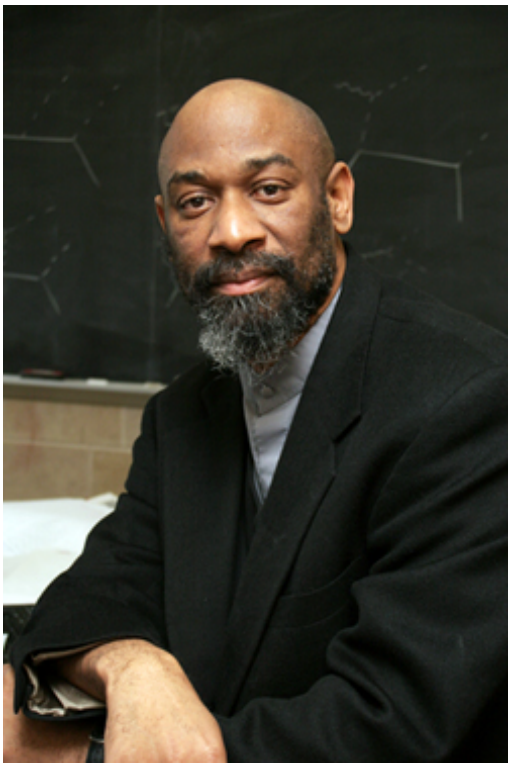
For the 2008 nomination the committee was:

2008 GHP Fellowship Committee

Stanley Brodsky	Matthias Burkardt	Keith Griffioen
sjbth@slac.stanford.edu	burkardt@nmsu.edu	griff@physics.wm.edu

Stan Brodsky was Chair. This Committee is currently processing the nominations.

The Executive urges members of GHP to be prepared in 2009 to nominate colleagues who have made advances in knowledge through original research and publication or made significant and innovative contributions in the application of physics to science and technology. They may also have made significant contributions to the teaching of physics or service and participation in the activities of the Society.



Sebastian (left), the 2007 GHP Fellow, and Winston (right), a 2007 Fellow and Chair-Elect of GHP.

The instructions for nomination may be found at
http://www.aps.org/programs/honors/fellowships/nominations.cfm
The entire process is now performed on-line.

A few things to know before proceeding, however. One must

- Ensure nominee is a member of the Society in good standing. The on-line site will do this for you but it's best to check beforehand, to save yourself time or get your nominee to join APS and/or GHP.
- A nomination requires a sponsor and a co-sponsor. During the on-line nomination process, you will be required to provide details for a co-sponsor. After you complete a nomination, the co-sponsor will be notified by EMail. It would be best to coordinate with the co-sponsor beforehand.
- You will require supporting letters, that will need to be up-loaded to the APS web site. Two letters of support are sufficient. Individuals providing letters of support do not have to be members of the APS, however, it is preferable in practice that sponsors be APS Fellows.
- The nomination process should be complete prior to GHP's deadline:
  25th April 2009

The APS will subsequently forward the Nominations to the GHP Fellowship Committee. The 2009 Fellowship Committee will be chaired by the incoming Vice-Chair of GHP.

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3 Budget News

On 17 March a bipartisan group of senators signed a letter requesting that $350 million be included in the Fiscal Year 2008 supplemental appropriations bill to rectify the damage done to science by last years Omnibus Appropriations Bill. The letter urges funding for the Department of Energy's Office of Science and the National Science Foundation to restore critical science programs. It was sent to the Senate Appropriations Committee leadership and signed by the following senators: Lamar Alexander (R-TN); Bob Corker (R-TN); Jeff Bingaman (D-NM); Pete Domenici (R-NM); Richard Durbin (D-IL); Dianne Feinstein (D-CA); Ted Kennedy (D-MA); and Chuck Schumer (D-NY).

Funding shortfalls contained in the Omnibus have resulted in the loss of more than 500 jobs at national laboratories; cuts to grants and fellowships at universities; and reductions in operations of scientific user facilities. The Omnibus also eliminated the $160 million U.S. contribution to the construction of ITER, the centerpiece of international fusion energy research. The FY08 budget, instead of doubling funding as outlined in the bipartisan American COMPETES Act, which Congress passed by an overwhelming margin last year, even fails to provide for inflation adjusted costs.

Detailed budget statements for FY09 can be found at the following links:

- High Energy Physics ... http://www.science.doe.gov/obp/FY_09_Budget/HEP.pdf;
  A recent budget presentation by Denis Kovar is available at this link. It contains the following observations:
  FY 2009 Budget Request($805M ... + $115M over FY 2008 ($689M)) –
  - Expectation of 6 month Continuing Resolution (CR)
    - Tevatron plans to run 6 months into FY 2009
    - LHC program will be supported (but no growth)
    - Some projects will be delayed
    - Still plan to proceed with JDEM (Joint Dark Energy Program) selection
    - Continue discussions on participation in LHC Phase I upgrade
    - Advanced Plasma Accelerator Facility project will be delayed
    - Across program – higher priority programs supported
  - Significant impacts
    - Staff reductions at National Laboratories
    - Unable to proceed with NOvA (consider termination of project)
    - ILC & SRF R&D supported at a minimal level
  - FY 2009 Appropriation is pivotal
    - Future of HEP Program will depend upon level of FY 2009 Appropriation
    - HEPAP (P5) Report is viewed as important for determining funding level
- Nuclear Physics ... http://www.science.doe.gov/obp/FY_09_Budget/NP.pdf
  A recent budget presentation by Jehanne Simon-Gillo is available at this link. It contains the following observations:
  Nuclear Physics (NP) is at a crossroads
  - Last year of possibly implementing the President's American Competitive Initiative
  - No one knows what the position of the new Administration will be
  - FY 2006 was a dismal year for NP

  - FY 2007 and FY 2008 Appropriations were also difficult
    * Despite verbal support from Congress
    * Despite positive House and Senate markups of budget
  - FY 2009 Continuing Resolution will have a strong negative impact on the program and particularly operations of facilities
    * In FY 2008, we are at the level at which NSAC acknowledged that we could not afford to operate both of our major facilities.
    * The case for long term basic R&D and the importance of the NP program must be made to Congress

- And the entire Office of Science budget request to Congress at http://www.science.doe.gov/obp/FY_09_Budget/FY_09_Budget.htm

Continuing with budget news, the *American Academy of the Arts and Sciences* has released a White Paper entitled "ARISE: Advancing Research In Science and Engineering". A press release is available at http://www.amacad.org/news/newArise.aspx. It begins with the statement: "Targeted programs and policies to support early-career investigators and high-risk, high-reward research are needed to preserve U.S. leadership in science and technology..." and continues "Noting that the average age for first-time recipients of primary research grants from the National Institutes of Health is 42.4 and rising, and that the success rate for first-time grant applicants has declined from 86% in 1980 to 28% in 2007 ..." Among a range of recommendations, the White Paper urges federal research agencies to re-evaluate peer review systems, invest in program officers, and more systematically track demographic data on investigators on a government-wide basis. Complete information on this White Paper is available at http://amacad.org/arisefolder/default.aspx.

On a not altogether unrelated matter, the Offices of High Energy and Nuclear Physics has seen some changes. Robin Staffin has asked to be reassigned to a position as a senior science advisor to the Director. Dennis Kovar has been detailed to serve as the Acting Director of the Office of High Energy Physics. Jehanne Simon-Gillo is now Acting Director of the Office of Nuclear Physics while Dennis Kovar carries out the responsibilities of his new position. The Theory Program Manager position in the Office of Nuclear Physics is vacant. Ted Barnes, one time Chair of GHP, is currently serving as the Theory Detailee. DOE have advertised the position as Program Manager for Nuclear Theory. The vacancy notice and application instructions can be accessed on the web at: http://www.usajobs.gov.

4 APS April Meeting, 2009

A topical group is invited to participate in planning the program of major APS meetings. This year, GHP is alone sponsoring one invited session at the April meeting in Denver, Colorado. The April Meeting is actually taking place in May; viz., 2-5 May 2009.

http://www.aps.org/units/pmfc/meetings/meeting.cfm?name=APR09

The number of sessions can grow if we increase our membership and visibility.

Planning for the 2009 April Meeting will begin in the Autumn. The program committee for the meeting is

GHP Program Committee, preparing for April 2009

Mary Alberg	David Richards	Winston Roberts
alberg@seattleu.edu	dgr@jlab.org	wroberts@fsu.edu

Winston Roberts is Chairman. GHP Members are encouraged to begin thinking about the program now. Making suggestions early is no crime. The Committee will welcome them, and certainly insist on them once planning begins in earnest. To be of most assistance, a nomination should be EMail-ed to the program committee chairman and provide (it should all fit within a $\frac{1}{2}$-page)

- Topic (title and short description)
- Rationale as to why the topic is timely
- Speaker (Name and qualifications)

4.1 APS April Meeting, 2008

The Program Committee for the 2008 April APS meeting was

Paul Eugenio (FSU)	Curtis Meyer (CMU)	Robert Pisarski (BNL)
eugenio@fsu.edu	cmeyer@cmu.edu	pisarski@quark.phy.bnl.gov

They organised a full GHP session entitled "Recent Highlights in Hadronic Physics." The Committee was chaired by Curtis Meyer and the session by Reinhard Schumacher.

- Jamie Dunlop, BNL – *Highlights on Hadronic Physics from Heavy Ion Physics* – The program at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory has been a resounding success, leading to qualitative advances in our understanding of both the properties of the universe in its earliest stages and the spin of the proton. The study of this matter, created in the laboratory through collisions between nuclei at high energies, is entering into a new, quantitative phase with upgrades to both the detectors and the collider, termed RHIC II. Limitations of current measurements will be reviewed, along with the upcoming methods to produce high precision quantification of the properties of the matter produced at RHIC.
- Eric Swanson, Pitt – *The new charmonium states* – A review of the properties and theoretical interpretations of the newly discovered charmonium states is presented.
- Mike Williams, CMU – *Partial Wave Analysis Results for $\gamma p \to p\omega$ using Data from CLAS at Jefferson Lab* – Relativistic quark models predict strong couplings to $p\omega$ — relative to $N\pi$ — for some of the *missing* N^* states. Previous searches for these states in $\gamma p \to p\omega$ have relied solely on differential cross section measurements. I will present final differential cross section and ω spin density matrix element measurements obtained from the CLAS $g11a$ dataset. Measurements at ~ 20 points in each of 112 $\sqrt{s}$ bins over the range 1.72 GeV $< \sqrt{s} <$ 2.84 GeV have been made (~ 2000 total points). These are the first *high precision* polarization measurements made for ω photoproduction. I will also present partial wave analysis results for this channel. These results are the first to be constrained by precise polarization information. Strong evidence for resonance contributions to $\gamma p \to p\omega$ has been found.

In addition to this session, GHP combined its $\frac{1}{2}$-session with the DNP and the FBS Topical Group to form two full sessions that focused on computational techniques in nuclear physics: FBS/GHP (this is mislabelled in the Bulletin) ...
http://meetings.aps.org/Meeting/APR08/SessionIndex2/?SessionEventID=82813

- Werner Tornow, Duke U. & TUNL – *The Three-Nucleon Analyzing Power Puzzle - The Past 20 Years*
- Scott Bogner, MSU – *Towards a Microscopic Density Functional Theory for Nuclei*
- Petr Navratil, LLNL – *Ab initio no-core shell model with continuum*

DNP/GHP ...
http://meetings.aps.org/Meeting/APR08/sessionindex2/?SessionEventID=82912

- Colin Morningstar, CMU – *Hadron Physics Computations in Lattice QCD*
- Alan Calder, SUNY - Stony Brook – *Modeling Type Ia Supernova Explosions*
- Haiyan Gao, Duke U. – *Nucleon structure study using a polarized ^{3}He target*

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5 GHP09

The *Third Meeting of the APS Topical Group on Hadronic Physics* will take place in 2009. Quite possibly in May. **Winston Roberts** has volunteered to serve as Chairman of the Organizing Committee. We will provide further details as they become available.

Details of the Second Meeting, which took place during the period October 22-24, 2006 at the Opryland Resort, Nashville, Tennessee, can be found at
http://fafnir.phyast.pitt.edu/GHP06/index.html ,
and most of the presentations made can be obtained from
http://www.hep.vanderbilt.edu/ johnswe/ghp06/Pgm.html.

The Proceedings of the Second Meeting (http://www.iop.org/EJ/toc/1742-6596/69/1) were published in the open access "Journal of Physics: Conference Series" which is published by Institute of Physics Publishing in the UK.

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6 Membership

At the beginning of 2005, the GHP had 308 members. (Material in this section is obtained from http://www.aps.org/membership/units/statistics.cfm.) On 8 Jan. 2007 the number was 355, which was a 15% growth over two years. On 7 April 2008 the number was 387. This is a growth of 9% and takes the growth over three years to 26%. GHP accounts for 0.86% of APS membership.

There are ten topical groups. In terms of membership, GHP can be compared with the following four. At this last count: the *Few Body Systems* topical group had 317 members, which is a slight drop on previous counts; the Group on *Plasma Astrophysics* was steady on 370 members; the Group on *Shock Compression* had 399 members, again a slight drop; and the Group on *Fundamental Constants* rose to 428 members. The other Groups are larger: http://www.aps.org/membership/units/upload/Quarterly-Units-April08.pdf.

On 17 January 2008, GHP had 366 members: 313 male members, of which 60 are Fellows of the APS, and 36 female members, of which 2 are Fellows. (NB. female/male = 12%. 17 members do not identify sex. Note, too, that the vast majority of the Fellows were elected before GHP came into being.)

For comparison DNP has 2631 members (f/m = 14%) and DPF, 3474 (f/m = 10%). In the last year, both DNP has grown by 4.4% and DPF by 3.1%. Only 232 of DNP's members belong to GHP (increase of 6.9%) and 231 from DPF (increase of 2.7%). These fractions are an improvement on last year. Moreover, it is the first time that DNP cross-membership in GHP exceeds that of DPF. Nevertheless, there are probably still many Hadron Physics researchers who are not involved with GHP.

Hence, if you are reading this newsletter but are not a member of GHP, *please join*. Current APS members can add units online through the APS secure server.

- To join GHP, go to our web page http://www.aps.org/units/ghp/index.cfm and look for the "Join This Unit" link on the right-hand-side of the page.

On the other hand, if you are already a member of GHP, please discuss the merits of our Topical Group with your colleagues and encourage them to join. As noted above, we continue to have success with this.

Membership in a strong GHP brings many benefits. A vital GHP

- establishes and raises the profile of Hadron Physics in the broader physics community, e.g., by nominating members
  - to APS governance committees,
  - to APS prize and award selection committees,
  - for election to Fellowship in the APS
- has a greater role in planning the program for major APS meetings;
- and provides a vehicle for community action on topics that affect the way research is conducted and funded.

Membership is only $7. Of this, GHP receives $5 from the APS. (The remainder stays with the APS and covers the many services they provide.) With this support we can be an active force for Hadron Physics. The money can be used, for example, to assist with: the organization of meetings – GHP09; the preparation of publications that support and promote the GHP's activities; and the participation in those fora that affect and decide the direction of basic research.

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7 Forthcoming Meetings

The GHP web site http://www.aps.org/units/ghp/ has a *Conferences* link – http://www.aps.org/units/ghp/meetings.cfm. This lists meetings that are likely to be of interest to GHP's membership. The Executive welcomes suggestions for postings.

The following meetings are currently listed for the coming year:

June, 08 ...

- 2008 National Nuclear Physics Summer School
  15-27 June 2008, The George Washington University, Washington DC

July, 08 ...

- Light Cone 2008: Relativistic Nuclear and Particle Physics
  7-11 July 2008, Université de Haute Alsace, Mulhouse, France
- QCD 08 14th International QCD Conference
  7-11 July 2008, Montpellier, France
- Lattice 2008, XXVI International Symposium on Lattice Field Theory
  14-19 July, Williamsburg VA
- XQCD 2008 – 6^{th} Workshop on QCD in Extreme Conditions
  21-23 July, North Carolina State University, NC
- ICHEP08, 34th International Conference on High Energy Physics
  29 July – 5 August, Philadelphia, Pennsylvania

August, 08 ...

- Heavy Quark Physics, Helmholtz International Summer School
  11-21 August, Bogoliubov Laboratory of Theoretical Physics, Dubna, Russia
- 25^{th} Student's Workshop on Electromagnetic Interactions
  31 August - 5 September, Bosen (Saarland) Germany (Organised by Johannes Gutenberg University, Mainz)

September, 08 ...

- Quark Confinement and the Hadron Spectrum
  1-6 September, Johannes Gutenberg University, Mainz, Germany
- Approaches to Quantum Chromodynamics
  7-13 September, Oberwölz, Austria
- Diffraction 2008 – International Workshop on Diffraction in High-Energy Physics
  9-14 September, La Londe-les-Maures, France

October, 08 ...

- Electromagnetic N-N* Transition Form Factors Workshop
  13-15 October, JLab, VA
- 2008 Annual Meeting of the APS Division of Nuclear Physics
  23-26 October, Marriott City Center Hotel, Oakland, California

November, 08 ...

- PANIC08, 18th International Conference on Particles And Nuclei
  9-14 November, Eilat, Israel

March, 09 ...

- TIPP09, 1st International Conference on Technology and Instrumentation in Particle Physics
  12-17 March, Epocal Tsukuba, Tsukuba, Japan
- CHEP09, International Conference on Computing in High Energy and Nuclear Physics
  21-27 March, Prague, Czech Republic
- Quark Matter 2009
  29 March - 4 April, Knoxville, Tennessee

May, 09 ...

- April Meeting of the American Physical Society
  2-5 May 2009, Denver, Colorado

We note that, in addition to those listed explicitly above, there are numerous other meetings at the European Centre for Theoretical Studies in Nuclear Physics and Related Areas which are of interest to GHP members. The complete list can be found at: http://www.ect.it/ under the link "Meetings in 2008."

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8 Long Range Plan

8.1 Nuclear Physics

In a letter dated ***17 July, 2006***, the Department of Energy's (DOE) Office of Science for Nuclear Physics and the National Science Foundation's (NSF) Mathematical and Physical Sciences Directorate charged the Nuclear Science Advisory Committee (NSAC) to "conduct a study of the opportunities and priorities for U.S. nuclear physics research and recommend a long range plan that will provide a framework for coordinated advancement of the nation's nuclear science research programs over the next decade." This request set in motion a bottom-up review and look forward by the nuclear science community. With input from this community-wide process, a 59 member working group, which included the present NSAC members, gathered at the beginning of May, 2007, to develop guidance on how to optimize the future research directions for the field based on the projected resources outlined in the charge letter from DOE and NSF. A new long range plan – The Frontiers of Nuclear Science – grew out of this meeting. It is available at http://www.sc.doe.gov/np/nsac/nsac.html.

The primary recommendations are

1. Completion of the 12 GeV CEBAF Upgrade at Jefferson Lab.
2. Construction of the Facility for Rare Isotope Beams (FRIB), a world-leading facility for the study of nuclear structure, reactions, and astrophysics. NB. On 20 May, 2008, the Department of Energy released a Funding Opportunity Announcement regarding the submission of applications for the conceptual design and establishment of a Facility for Rare Isotope Beams (FRIB). Proposals are due by 21 July, 2008.
3. A targeted program of experiments to investigate neutrino properties and fundamental symmetries.
4. Implementation of the RHIC II luminosity upgrade, together with detector improvements.

These recommendations were followed by *Initiatives*. Leading the list was a statement on Theory: "We recommend the funding of finite-duration, multi-institutional topical collaborations initiated through a competitive, peer-review process. [...] These initiatives are intended to bring together the best in the field, leverage resources of smaller research groups, and provide expanded opportunities for the next generation of nuclear theorists." It was followed by a statement on accelerator R&D, which urged: "targeted support of proposal-driven accelerator Research and development supported by DOE and NSF nuclear physics."

8.2 High Energy Physics

In November 2007, at the request of the Office of High Energy Physics of the Department of Energy and the National Science Foundation, the High Energy Physics Advisory Panel reconstituted the *Particle Physics Project Prioritization Panel* for the purpose of developing a plan for US particle physics for the coming decade under a variety of budget assumptions. The panel organized three information-gathering meetings, at Fermilab in January 2008, at Stanford Linear Accelerator Center in February 2008, and at Brookhaven National Laboratory in March of 2008. Besides talks by experts in the field, each of the three meetings included a Town Meeting, an open session where members of the community could voice their advice, suggestions and concerns to the panel. The panel also invited letters from the worldwide particle physics community, to offer their points of view for consideration. A final report was presented to HEPAP in May of 2008.

The overall recommendation from the report is that the US maintain a leadership role in world-wide particle physics. To do this, the panel recommended a strong, integrated research program for US particle physics at three frontiers: the **Energy Frontier**, using both hadron colliders and lepton colliders to discover and illuminate the physics of the Terascale; the **Intensity Frontier**, comprising neutrino physics and high-sensitivity experiments on rare processes that will tell us about new physics beyond the Standard Model; and the **Cosmic Frontier**, probing the nature of dark matter and dark energy and other topics in particle astrophysics.

The report then continues with 23 recommendations on how to implement such a program under various budget scenarios. The final report, entitled:

US Particle Physics: Scientific Opportunities.
A Strategic Plan for the Next Ten Years (June 2, 2008)

can be found on the DOE Office of High Energy Physics web site:
http://www.er.doe.gov/hep/hepap_reports.shtm.

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9 State of the Laboratories

For this issue the Executive solicited input for this section from a number of laboratories. We received JLab's input from Wally Melnitchouk in time for inclusion.

JLab
(Communicated by Wally Melnitchouk, JLab; EMail: wmelnitc@jlab.org)

One of the highlights of the past year at Jefferson Lab is the progress towards the realization of the 12 GeV Upgrade of the CEBAF accelerator. In November, 2007, the Critical Decision-2 (CD-2) was awarded, meaning DOE approval for the project's baseline scope, cost and schedule. The Lehman review will follow in July, with the next milestone, CD-3, expected in fall 2008. This will authorize funds to be spent on construction (http://www.jlab.org/12GeV/updates.html).

With the announcement in March 2007 that, after almost 8 years at the helm as JLab Director, Christoph Leemann planned to retire, a search was undertaken for a new Director. The process was completed on April 3, 2008, when Hugh ("Mont") Montgomery was named the new Director. Mont has for the past several years been the Associate Director for Research at Fermilab. He will begin as JLab Director on September 2, 2008.

On the physics front, one of the exciting developments in the past 12 months has been the

measurement of deeply virtual Compton scattering cross sections on the neutron (in practice, ^{3}He), from which a constraint was inferred on the total angular momentum of the nucleon carried by u and d quarks, $J_u + J_d/2 = 0.18 \pm 0.14$ [M. Mazouz et al., Phys. Rev. Lett. **99**, 242501 (2007)]. Combining this with preliminary DVCS data on the proton from HERMES, one finds that the total u-quark angular momentum is around 0.2 - 0.6, while that of the d-quark is between zero and 0.3. The precise values depend on the GPD parametrization adopted, and one of the challenges for theory is to devise a model-independent way to proceed from a finite set of measurements to robust constraints on J_u and J_d.

This GHP Newsletter was edited by Craig Roberts for the Executive Committee.