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NB. EMail addressed to [ghpexec@anl.gov](mailto:ghpexec@anl.gov) will reach all members of the Executive.

Join GHP by following a link on the lower-right of our web page; namely, from:  
<http://www.aps.org/units/ghp/>.

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## 1 Elections

Elections will be held for three posts in the GHP Executive (Vice-Chair, Secretary/Treasurer, and Member-at-Large) in 2018. Paul Reimer (Past Chair), Ramona Vogt (Secretary/Treasurer), and Xiaochao Zheng (Member-at-Large) will have completed their terms. (According to the GHP Bylaws, a Secretary/Treasurer can serve two consecutive terms. Ramona will have completed one term in 2018.)

We urge GHP members now to begin considering whom they would like to see filling the three open positions in 2018 and encourage members with ideas to contact the *Chair of the Nominating Committee* and pass on their suggestions. There is strength in diversity and so the Executive would like to see nominations from across the entire spectrum of GHP’s membership.

Our rules state that: *the Committee shall nominate at least two candidates for the offices of Vice-Chair and for the open position of Member-at-Large; the slate of candidates will be balanced as much as possible to ensure wide representation amongst the various fields of physics included in the GHP’s membership; the Nominating Committee shall be chaired by the immediate Past Chair,*

Paul Reimer ([reimer@anl.gov](mailto:reimer@anl.gov))

*this year; and shall include four members in addition to its Chair, one of whom shall be appointed by the APS.*

Attracting and serving a diverse and inclusive membership worldwide is a primary goal for APS. In calling for nominations, we wish to remind you how important it is to give full consideration to qualified women, members of underrepresented minority groups, and scientists from outside the United States.

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## 2 Membership

At the beginning of 2018, the APS Unit Membership Statistics list GHP with 467 members, which represents 0.8% of APS membership. This represents a loss of 9 members since January

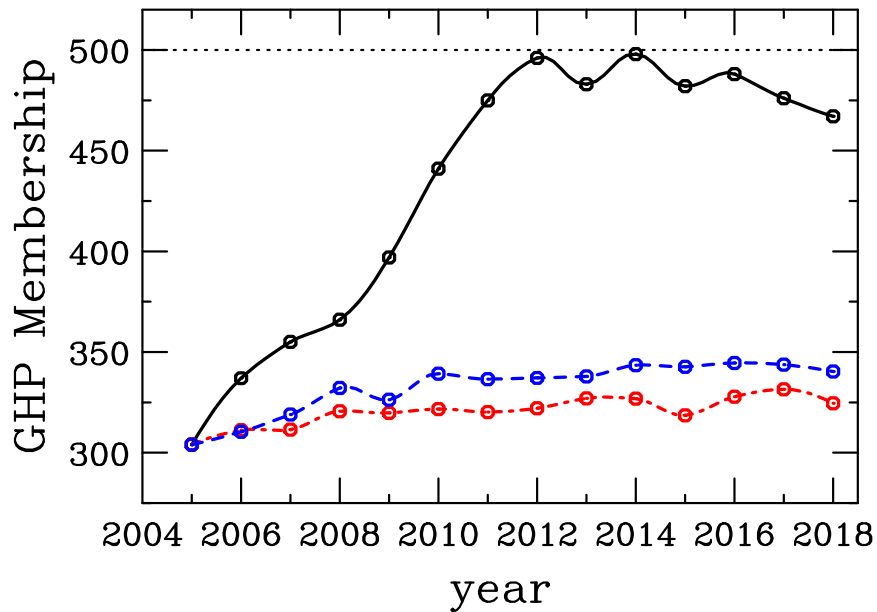


Figure 1: Solid line GHP membership, absolute value, with 2018 representing the APS Official Count at the beginning of 2018; dashed DNP membership normalized to GHPs value in 2005 (2401  $\rightarrow$  304); and dot-dashed DPF membership normalized to GHPs 2005 value (3291  $\rightarrow$  304).

2017. If a Topical Group has a membership of 3% or more of the APS members, it can apply to become a Division. The Soft Matter Topical Group, formed in 2015, is currently at 3.4% of APS membership and could soon transition to Division status, joining the 16 existing Divisions. Interestingly, three of the existing Divisions, Polymer Physics, Physics of Beams, and Laser Science are now below the 3% criteria. Of the divisions, most grew in 2017, with decreases between 2017 and the start of 2018 only in Astrophysics, Nuclear Physics, and Particles & Fields, the Divisions with the most overlap with the GHP membership. As might be expected from the size of the March Meeting, the largest division is Condensed Matter Physics with 12.2% of APS members belonging to this division.

While the GHP membership has decreased slightly in the last several years, the APS as a whole has been gaining members, starting off 2018 with 55,368 members, a 2.5% increase over the 2017 membership peak.

There are currently thirteen Topical Groups, because even with two recent transitions from Topical Groups to Divisions (the Gravitational group and the Quantum Information group both transitioned to division status in 2016 and 2017 respectively), the group on Medical Physics was inaugurated in 2017. Of these Groups, GHP is now one of the smallest, ranked 10<sup>th</sup> in terms of membership. Only Few Body Systems and Plasma Astrophysics are smaller. In 2017, most Topical Groups gained in membership except for Energy Research and Applications, Few Body Systems, Instrument and Measurement Science, and Physics Education Research, in addition to our decrease.

Membership in the Forums and Sections, free to join (at least for the first two forums), is generally rather high. Of the forums, the smallest, with 3.5% of APS members, is Outreach & Engaging the Public. While this may not be indicative of interest APS members have in communicating their passion and enthusiasm for physics to the broader community, it is an

interesting detail to note. On the other hand, the Forum on Physics & Society is one of the largest, with 10.4% of APS members. (The Industrial & Applied Physics Forum is currently largest.) A look at the distribution of Section membership clearly reflects the overall distribution of US physicists, with the largest sections on the coasts.

The GHP has 105 student members (a decrease of 23 since the start of 2017) and 19 early career members (a decrease of 9 since the start of 2017), compared to 288 regular members. (The membership categories are regular, senior, student, early career, and life.) While this is good, in some Groups the number of students is larger than the number of regular members. Noting that the number of student and early career members of GHP has decreased, it is clear that the GHP should be trying to attract and retain more such members. Encouraging students to join GHP and to maintain their membership in the unit after graduation is a good practice.

In terms of gender diversity, the GHP ranks 10<sup>th</sup> among the Topical Groups in members that stated ‘female’ as their gender, with 9.9%, a decrease over 2017. (About 5% of members declined to state a gender.) Encouragingly, 20% of the Forum on Graduate Student Affairs (FGSA) are female. Other Units with  $\sim 20\%$  female members are the Division of Biological Physics (DBIO) at 20%, Topical Group on Education Research (GPER) at 28%, the Forum on Outreach and Engaging the Public (FOEP) at 26.5%, and the Group on Medical Physics (GMED) at 29.7%. Across the geographically-distributed Sections, approximately 14% of all members are female.

So long as GHP membership remains at its current level, we will be able to nominate two regular Fellows, an excellent boost for Hadron Physics, see Sec. 3. Currently, 125 of GHP members are Fellows, 25.6% of our membership, a higher percentage than either the Division of Nuclear Physics (20%) or the Division of Particles and Fields (22.7%). Thus the GHP is doing well in this category.

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.

Whether one considers the APS alone, or takes a broader perspective, the impact GHP that can have is primarily determined by the number of members. (It is also influenced by the energy of the Executive.) The Executive urges existing members to encourage their colleagues to join us. We know there are absent-minded people who have overlooked the opportunity to join GHP but many will react positively to a little gentle prodding.

Unit membership is now \$10. Of this, GHP receives \$5 from the APS. The remainder stays with the APS and covers the many services they provide. They have been very helpful, *e.g.*, the last five GHP meetings have been co-located with the APS April meeting which results in substantial savings for us. With this support we can be an active force for Hadron Physics.

The money can be used, for example, to assist with: the GHP Dissertation Award see Sec. 4; the organization of meetings such as GHP2019, see Sec. 6; the preparation and publication of manuscripts that support and promote the GHPs activities; and participation in those fora that affect and decide the direction of basic research.

Hence, if you are reading this newsletter but are not a member of GHP, please join. On the other hand, if you're already a member, please circulate this newsletter to your colleagues and students and encourage them to join. Current APS members can add units online through the APS secure server by following a link on the lower-right of our web page; namely, <http://www.aps.org/units/ghp/index.cfm>.

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### 3 Fellowship

This is a good time 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. Since we are in the neighborhood of 500 members, we are allocated TWO Regular nominations.

The instructions for nomination may be found at <http://www.aps.org/programs/honors/fellowships/nominations.cfm>  
The entire process is now online.

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

- Ensure the nominee is a member of the Society in good standing as well as a member of GHP. The online 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 GHP.
- A nomination requires a sponsor and a co-sponsor. During the online 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.
- In addition to the nomination letters, you will require supporting letters, that will need to be uploaded 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 the sponsor and co-sponsor should be APS members.
- The nomination process should be complete prior to GHP's deadline:

**Monday 1<sup>st</sup> June 2018**

The APS will subsequently forward the nominations to the GHP Fellowship Committee, chaired by GHP Vice-Chair Garth Huber.

<b>Fellowship Committee</b>		
	Garth Huber ( <i>Chair</i> ) <a href="mailto:huberg@uregina.ca">huberg@uregina.ca</a>	
Carl Gagliardi <a href="mailto:cgggroup@comp.tamu.edu">cgggroup@comp.tamu.edu</a>	Susan Gardner <a href="mailto:svg@pa.uky.edu">svg@pa.uky.edu</a>	Eric Swanson <a href="mailto:swansone@pitt.edu">swansone@pitt.edu</a>

The Executive urges members of GHP 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.

Here it is worth pointing out that currently 28.7% of the GHP members are Fellows. Of the  $\sim 10\%$  of GHP membership identifying themselves as female,  $\approx 25\%$  of female GHP members are Fellows, on par with the level of male Fellows. In terms of the percentage of female Fellows in overall membership, GHP is actually doing better in this regard than many units. Maintaining a diversity in our Fellows can broaden the impact of the GHP.

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## 4 Dissertation Award

The GHP Dissertation Award was established in February 2012, thanks to significant contributions from Brookhaven Science Associates (the management contractor for the Brookhaven National Laboratory), Jefferson Science Associates, LLC (the management contractor for Jefferson Lab), Universities Research Association (the management contractor for Fermi National Accelerator Lab) and personal contributions from some of our members.

The Award is a prize of \$1000 and a travel allowance of up to \$1500; and the winner is invited to deliver a plenary presentation at the Biennial GHP Meeting, the next of which will take place in 2019.

At this time the GHP Executive would like to urge GHP's members to begin thinking about suitable candidates for the Third GHP Dissertation Award, nominations for which will close on

**Monday 8 October, 2018**

The nominations should be sent to Tanja Horn, Chair of the Dissertation Award Committee. The members are:

**Dissertation Award Committee**

Tanja Horn (*Chair*)

[hornt@jlab.org](mailto:hornt@jlab.org)

Anne Sickles <a href="mailto:sickles@illinois.edu">sickles@illinois.edu</a>	Jo Dudek <a href="mailto:jdudek@wm.edu">jdudek@wm.edu</a>
Karl Slifer <a href="mailto:karl.slifer@unh.edu">karl.slifer@unh.edu</a>	Michael Birse <a href="mailto:mike.birse@manchester.ac.uk">mike.birse@manchester.ac.uk</a>

The submissions are judged according to the following criteria: quality of the written dissertation (40%), contribution of the student to the research (30%), impact of the work (15%), and broader involvement of the student in the community (15%).

The current endowment enables GHP to present the Dissertation Award biennially. In order to maintain that endowment and, perhaps, to expand the Award, the Executive encourages our members to

**[Donate to the award fund.](#)**

For information on how to proceed, please see:

<https://www.aps.org/memb-sec/profile/DonationFunds.cfm>

It would be ideal if we could increase the endowment so that sufficient funds were available to present this award in every year and thereby honor more of the bright young scientists

entering Hadron Physics.

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## 5 GHP Program at the APS April Meeting, 2018

Columbus, OH

<http://www.aps.org/meetings/april/>

GHP participates in the annual APS April Meeting, which is also the primary meeting of the unit in even years. Roughly 100 of our members attend the APS April meeting each year.

GHP is allocated two invited sessions at the April meetings. We often organize joint sessions with other units, in order to raise our profile by increasing the number of sessions sponsored by the GHP. (The maximum currently possible is four.)

The program committee for the 2018 APS April meeting is

### GHP Program Committee

Tanja Horn (*Chair*)

[hornt@jlab.org](mailto:hornt@jlab.org)

Kai-Thomas Brinkmann <a href="mailto:kai-thomas.brinkmann@exp2.physik.uni-giessen.de">kai-thomas.brinkmann@exp2.physik.uni-giessen.de</a>	Michael Engelhardt <a href="mailto:engel@physics.nmsu.edu">engel@physics.nmsu.edu</a>
Renee Fatemi <a href="mailto:rfatemi@pa.uky.edu">rfatemi@pa.uky.edu</a>	Susan Gardner <a href="mailto:svg@pa.uky.edu">svg@pa.uky.edu</a>

The Program Committee has prepared an exceptional program for the April 2018 meeting. There will be four co-sponsored invited sessions: two with DNP and two with DNP and GFB where GHP is a third co-sponsor as well as one GHP session.

### 5.1 GHP invited:

GFB/DNP/GHP: From QCD to the Deuteron

Session C05, A123-125, Saturday 14 April 13:30-15:18, Chair: William Detmold (MIT)

- Phiala Shanahan (MIT) *Lattice QCD and the gluonic structure of light nuclei*
- Victor Mokeev (Jefferson Lab) *New Results on the Nucleon Resonance Spectrum and Structure from Photo- and Electroproduction Experiments*
- Martha Constantinou (Temple University) *Lattice Generalized Parton Distributions and Form Factors of the Nucleon*

GHP: Snapshots of the Dynamics of the Nucleon

Session H05, A123-125, Sunday 15 April 10:45-12:33, Chair: Bob McKeown (Jefferson Lab)

- Julie Roche (Ohio University) *Glimpses of gluons in spatial imaging through DVCS*
- Yi-Bo Yang (Michigan State University) *A glimpse of the proton spin through lattice*
- Prithwish Tribedy (BNL) *Glimpse on fluctuations in proton structure through heavy ion reactions*

GHP/DNP: The Structure of the Pion and Kaon as a Theatre of QCD

Session R06, B130, Monday 16 April 10:45-12:33, Chair: David Richards (Jefferson Lab)

- Garth Huber (University of Regina) *The experimental determination of the pion and kaon form factors and structure functions*
- Ian Clöet (ANL) *Partonic Structure of the Pion and Kaon*
- Bipasha Chakraborty (Jefferson Laboratory) *Studies of the pion and kaon in lattice QCD*

GHP/DNP: The Axial Structure of the Nucleon and Its Implications

Session S05, A123-125, Monday 16 April 13:30-15:18, Chair: Albert Young (North Carolina State University)

- Chia Cheng Chang (LBNL) *The axial coupling of the nucleon from Quantum Chromodynamics*
- Bastian Maerkisch (Technical University, Munich) *Precision determination of  $GA/GV$  from beta decay*
- Richard Hill (University of Kentucky and Fermilab) *The nucleon axial radius, its determination and implications*

GFP/DNP/GHP: Weakly-Bound Systems

Session Y05, A123-125, Tuesday 17 April 13:30-15:18, Chair: Kenneth Nollett (San Diego State University)

- Peter Mueller (ANL) *Precision measurements in light, weakly bound nuclei*
- Jordy de Vries (Nikhef) *Searches for beyond-the-Standard Model physics with light nuclei*
- Xilin Zhang (University of Washington) *Effective field theory for halo nuclei*

## 5.2 Other invited sessions of interest for GHP members:

DPB/DNP: Accelerators for Nuclear Physics Research: Status and Plans

Session C02, A112-113, Saturday 14 April 13:30-15:18, Chair: Michiko Minty (BNL)

- Ferdinand Willeke (BNL) *EIC Design and Challenges for eRHIC*
- Yuhong Zhang (Jefferson Lab) *EIC Design and Challenges for JLEIC*
- Jie Wei (Michigan State University) *FRIB Facility Goals, Status and Plans*

DPF: Exotic Hadrons from the LHC and B-Factories

Session S02, A112-113, Monday 16 April 13:30-15:18, Chair: Sheldon Stone (Syracuse University)

- Christoph Hanhart (Forschungszentrum Juelich) *Heavy Exotics: Concepts, Insights and Perspectives*
- Nathan Jurik (University of Oxford) *Tanaka Dissertation Award: Exotic states in  $B$  decays*
- Bilas Pal (University of Cincinnati and BNL) *Exotic states in  $e^+e^-$  collisions (Belle and BESIII)*



### 5.3 GHP contributed sessions cosponsored with the DNP:

GHP/DNP: Hadronic Physics I

Session B12, A222-223, Saturday 14 April 10:45-12:33, Chair: Ian Cloët (A NL)

GHP/DNP: Hadronic Physics IV

Session D12, A222-223, Saturday 14 April 15:30-17:18, Chair: Holly Szumila-Varna (Jefferson Lab)

GHP/DNP: Hadronic Physics II

Session J12, A222-223, Sunday 15 April 13:30-15:18, Chair: Michael Kohl (Hampton University)

GHP/DNP: Hadronic Physics III

Session K11, A220-221, Sunday 15 April 15:30-16:54, Chair: Or Hen (MIT)

### 5.4 Other contributed sessions that may be of interest to GHP members:

DNP: Hadrons and Light Ions; Bayesian Methods

Session G12, A222-223, Sunday 15 April 8:30-10:18, Chair: Roxanne Springer (Duke University)

DNP: Electromagnetic Production of Hadronic Resonances

Session J11, A220-221, Sunday 15 April 13:30-15:18, Chair: Reinhard Schumacher (Carnegie Mellon University) ()

DPF/DNP: QCD and Hadrons

Session U09, A111, Monday 16 April 15:30-17:06, Chair: Stephen Sekula (Southern Methodist University)

### 5.5 Business Meeting

We will have a business meeting after the awards session on Sunday 15 April to present our new fellow and discuss other business. The GHP Business Meeting will be from 18:45-19:55 in Room A110. The schedule is as follows:

**18:45** Introduction (Tanja Horn)

**18:55** EIC status/outlook (Bob McKeown)

**19:20** Advanced computing (David Dean)

**19:45** Finance/business report (Ramona Vogt)

## 6 GHP 2019: 8<sup>th</sup> Workshop of the GHP

The Eighth Workshop of the APS Topical Group on Hadron Physics will be held the three days immediately before the April APS meeting.

**10-12 April 2019**

The meeting will be held at the Sheraton Denver Hotel, the same location as the GHP meetings in 2009 and 2013.

The Program Committee will be chaired by David Richards and Garth Huber, the GHP Chair-Elect and Vice Chair respectively. The rest of the Program Committee will include members of the GHP executive and other GHP members. The full Program Committee will be announced in the next newsletter.

The topics covered included:

- AdS/QFT, novel phenomena
- Continuum QCD and Phenomenology
- Exotic hadrons
- Future facilities
- Lattice QCD
- Light and heavy quark mesons and baryons
- Nucleon spin physics and hadronic structure
- Physics of the quark-gluon plasma
- Physics of gluon saturation

Note that the April meeting itself will be in the same venue, 13-16 April, 2019 with David Richards as Program Committee chair. More information about both meetings and the Program Committee itself will be available in the next newsletter.

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## 7 Leadership Convocation

(Communicated by David Richards [dgr@jlab.org](mailto:dgr@jlab.org).)

The Leadership Convocation provides an opportunity for the elected leadership of the different divisions, groups and forums of the APS to become familiar with the activities, functions and resources of the society, to contribute to formulation of policies, and to convey the opportunities that the APS affords to the broader membership of the society. This year, Tanya Horn (Chair), Garth Huber (Vice-Chair) and David Richards (Chair-Elect) attended the convocation which took place in Washington, DC on Friday and Saturday at the beginning of February. The convocation was preceded by the Congressional Visit Day, in which David Richards participated; that is reported on elsewhere.

The convocation began with an overview of the APS by Kate Kirby, the CEO. She noted the increasing membership of the APS, manifest not only in membership numbers, but in

participation in APS meetings; this years “March Meeting” was the largest yet. Next year will witness an “All-APS” meeting in Boston that promises to be larger still. She emphasized that the regular and life members comprised less than 50% of the membership, with 25% of the members graduate students, and including a substantial international membership. The financial position of the APS was strong but there were some issues that needed to be addressed. One was retaining membership once graduate students obtained their degrees, and recruiting membership outside the traditional academic and research environments. A further issue was a perceived proliferation of prizes and awards, currently 73, that imposed some financial strains.

A crucial activity of the APS is the publication of Journals, both in terms of achieving the society’s mission and in ensuring its financial viability. There were presentations both by the Publisher, Matthew Salter, and by the Editor-in-Chief, Michael Thoennessen. They noted that the number of submissions increased by over 2.5%, and that there were more of the “right papers”, accepted for publication. The impact factor was very high, with 8.5 for *Physical Review Letters*, and 37 for *Reviews of Modern Physics*, with 80% of the authors international. One challenge is developing a vibrant publication model in an era where publications are moving from a “subscription” to “Open Access” model, where the burden of publication is borne by the authors, a change partly driven by the funding agencies both in the USA and abroad. One model is the SCOAP<sup>3</sup> partnership of libraries, laboratories and funding agencies for particle-physics publications. Finally, they noted the recent revamp of APS journals in commemoration of the 125<sup>th</sup> anniversary of the *Physical Review*, with some of the key papers made available to the public on a “free-to-read” basis.

Francis Slakey, the Chief Government-Affairs Office, described the efforts of the APS, and of its members, in influencing government policy, notably when policies were proposed that were detrimental to science. An outstanding example last year was the response to the 2018 President’s Budget, which proposed savage cuts to science. The APS responded by initiating rapid email responses by its members to key congressional figures who could influence spending; the success of this and like campaigns is reflected in the budget measures proposed both in the Senate and in the House.

Following the plenary session on the Friday morning, most of the remainder of the day was devoted to focused parallel sessions covering topics as diverse as International Affairs, Education and Diversity, Careers, Membership, Prizes and Awards, and Meeting Support. The GHP team attended different sessions to ensure that each activity was covered, and here we will just list some of the important take-home messages of interest to the broad GHP membership.

One need for the GHP is to increase its membership both to ensure the vitality of the group, and to ensure that we can maintain a strong APS Fellowship Program. Each group or division is allowed to send typically one message per year to APS members outside its own membership, and this provides an opportunity to recruit to the GHP physicists whose activities encompass hadronic physics, but who are not yet members. A further opportunity will be provided at the April Meeting, notably in the joint sessions with the APS.

The APS has substantial resources for information technology, for publicity material, and for the organization of conferences. The current information-technology framework is quite disjointed, with different databases for membership, for sorting materials for meetings, and maintaining a record of the differing skills and interests of APS members. The IT team is currently evaluating the development of an integrated system for APS activities, probably adapted from widely-used commercial software. There was a very entertaining presentation on

Communication, where the wide variety of material available to APS members was introduced, from physics-inspired (and inspiring!) cartoons and educational kits for children to a recent “adult coloring book”. Finally, with the next GHP meeting taking place in 2019 in concert with the Boston APS meeting, there was a description of some of the meeting support available to APS members.

An interlude in the parallel sessions was a presentation by Peggy Hoffman of *Mariner Consulting*, focused on the ways to inspire membership to engage in the activities of the APS. The speaker had briefed both commercial and non-for-profit organizations, and her approach was not only entertaining but very effective, and, with the developments in databases and IT promised by the APS, we will know who you are and how to engage you! Friday concluded with an after-dinner talk by Laura Greene, the outgoing president, focusing her talk on the international community of physicists.

Saturday morning was focused on a strategy session. The APS is at the beginning of a process to develop a new strategy, with the aim of a new strategy document in the Summer. For the strategy, the convocation split into groups of around eight, and were asked, as groups, to come up with possible answers to several key questions, such as the main challenges facing the APS, and how to broaden the membership. The responses and discussion was then distilled and collected as input by the APS leadership. This session was but the first stage in engaging APS membership, and further opportunities to develop the strategy will happen at the upcoming April (and March) Meeting.

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## 8 APS Unit Leaders Kick-Off APS 2018 Advocacy With More Than 90 Meetings on Capitol Hill

(Communicated by Tawanda W. Johnson, APS Press Secretary [tjohnson@aps.org](mailto:tjohnson@aps.org).)

Forty-eight volunteers representing APSs Unit leadership took to Capitol Hill on Feb. 1 to make the case for critical science policy issues. The volunteers represented 35 Units and participated in 93 meetings, representing 25 states and one territory during the Societys first Congressional Visits Day (CVD) in 2018.

“The opportunity to advocate for science in general, and physics in particular, is important”, said David Richards, chair-elect of the Group on Hadronic Physics. “Notably, I thought it was important that APS members had opportunities to meet their representatives and show how physics and science can benefit their constituents and contribute to U.S. leadership in science as a whole.”

Richards visited staffers representing Kentucky and Virginia congressional offices, along with Susan Gardner, a professor at the University of Kentucky and vice chair of the APS Topical Group on Precision Measurement and Fundamental Constants.

“Almost universally, all the staffers were both receptive, and indeed knowledgeable about science, irrespective of party affiliation,” added Richards.

“It was clear, for example, the Kentucky delegation was very aware of the EPSCoR (Established Program to Stimulate Competitive Research) and how that could benefit the state. All three groups we met were very receptive to the research and educational needs in Kentucky. In the case of Virginia, where there is already a very substantial science base, the

staffers were keen to know more about how infrastructure investment in science could benefit Virginia.”

Marion White, a Chicago-area physicist and secretary/treasurer for the APS Division of Physics of Beams, stated about her experience: “There was an almost universally positive reception from staffers in the Illinois offices we visited. Even in the most difficult office, we were able to find some common ground and have a meaningful discussion.”

White, who described her experience as “amazing” and “life-changing”, said she decided to participate in CVD because the United States has “fallen behind much of the rest of the developed world in science, technology, and education”.

She further explained, “The threats to our security from climate change, disease, cyber attacks to many others, appear to be ignored at the highest levels. I decided if I could contribute to anything positive, I should try.”

Kristan Corwin, chair-elect of the APS Division of Laser Sciences and associate dean for research at Kansas State University, expressed a similar concern about the countrys declining role as a global leader.

“I felt there has never been a more urgent need for scientists to reach out to Congress and ask for their help to preserve our nations leadership position in science and technology. Furthermore, I felt empowered by my experience as an associate dean with a bigger view of how academic research benefits and shapes our society at large.”

Corwin described her experience during the CVD as “wonderful”. “Greg Mack (manager of grassroots advocacy) and the APS as a whole displayed a deep knowledge of the big issues, and also an understanding of what we might be able to ask for to advance the agenda of science funding immediately, with an eye toward the long run.”

She added, “I found the staffers were really interested in how the larger issues affect their universities and districts back home, and what they can do to help.”

During their meetings with Congress, APS members addressed the following issues: research funding and infrastructure, STEM education, H-1B visas and climate change. The APS Office of Government Affairs (APS OGA) decided on the issues after surveying members during various meetings held last year. Volunteers were asked to advocate for research and infrastructure funding and given the opportunity to choose among the other issues based on their particular interests.

To ensure volunteers were adequately prepared for the meetings, Mack organized a video, small-group web videoconferences, and an in-person briefing session. APS OGA also supplied them with materials and scheduled their meetings.

“We were strategic in our approach to the meetings and wanted the APS members to be as prepared and comfortable as possible”, he said. “In addition to the online preparation, during the in-person session, we held a mock meeting, and the volunteers had opportunities to brainstorm about the most crucial part of their meetings: telling their personal stories and connecting the issues to their states and districts.”

Mack added, “I feel everyone had a good handle on the issues and was equipped with pertinent information and materials to have constructive conversations.”

“We’re off to a good start with our first CVD of 2018”, said Francis Slakey, chief government affairs officer for APS OGA. “We’ll face similar challenges in 2018 to the ones we faced last year,” Slakey added, “and the APS OGA will continue to up its game and partner with our

APS units.”

In 2017, APS OGA assisted Society members with 14,873 contacts—phone calls, emails, and meetings—to their congressional representatives on crucial science policy issues. These included targeted approaches in specific states and districts, 15 nationwide online-campaigns for APS units, and activities at APS meetings. In many cases, the House and Senate took action influenced by the strong response from APS members.

APS OGA will continue to implement its effective integrated advocacy strategy in 2018, supplementing it with even more effective targeting and mobilization methods. The office also plans to bring in new voices and partners to advocate for science, including working with the Packard Foundation and nearly a dozen science and engineering organizations on a coordinated effort to advocate for the federal investment in research.

“We are always developing and offering ways to help APS members be a voice for physics,” said Mack.

To learn more about the five issues the APS volunteers advocated for during the recent CVD and to take action, click on the Advocacy Dashboard <https://www.aps.org/policy/issues/index.cfm>.

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## 9 Meeting Summaries

NB. We would be pleased to receive summaries from GHP membership of meetings that they have organized or attended. Please send the summaries to the GHP Secretary-Treasurer.

### 9.1 Light-Cone 2017: Theory and Experiment for Hadrons on the Light Front

(Communicated by Anuradha Misra [misra@physics.mu.ac.in](mailto:misra@physics.mu.ac.in) and Chueng Ji [crji@ncsu.edu](mailto:crji@ncsu.edu))

The LIGHT CONE 2017 workshop is part of the series of Light-Cone meetings established under the auspices of the International Light Cone Advisory Committee (ILCAC), Inc. (<http://www.ilcacinc.org>). The 2017 meeting, as the ones before it, followed the objectives of ILCAC, Inc.: “to advance research in quantum field theory, particularly light-cone quantization methods to the solution of physical problems”, and “to assist in the development of crucial experimental tests at hadron facilities”.

The 2017 edition of the Light-Cone meeting took place at the University of Mumbai, India from the 18<sup>th</sup> to the 22<sup>nd</sup> of September. A detailed description of all aspects of the workshop, including its scientific program, can be found on the web page: <https://indico.cern.ch/event/613504/page/9935-scientific-programme> The slides of the talks are available at <http://www.lc2016.net/en/talks>. In addition, the members of the national and local organizing committee can be found at [https://indico.cern.ch/event/613504/attachments/1423266/2223632/Poster\\_LC2017.pdf](https://indico.cern.ch/event/613504/attachments/1423266/2223632/Poster_LC2017.pdf).

The workshop was supported in part by generous funding from the Jefferson Science Associates (JSA) and Jefferson Laboratory as well as the Indian agencies SERB-DST, India; CSIR, India; the University of Mumbai; TIFR, Mumbai and HRI, Allahabad. The financial support by JSA and Jefferson Lab allowed the ILCAC to award this year’s McCartor Fellowships to three

young physicists, one of whom could not attend the workshop. Thus his award was deferred to next years meeting. The award enabled the other two awardees to attend the conference and present the results of their research. They were Dr. Chandan Mondal, presently a postdoctoral fellow at CAS in Beijing, China and Jorge H. A. Nogueira, a double-degree Ph.D. student at the Instituto Tecnológico de Aeronáutica, Brazil and Università degli Studi di Roma, “La Sapienza”, Italy. The prize was awarded based on their Curriculum Vitae as well as their more recent works, “Leading twist GPDs and spin densities in a proton and “Relativistic studies of few-body systems using the Bethe-Salpeter approach respectively. Part of the Jefferson Lab funding was used to support Dr. Bipasha Chakraborty, a postdoctoral fellow at Jefferson Lab. The funding from the Indian funding agencies was used towards registration fees, travel, and accommodation for Indian students and young postdocs as well as some senior scientists.

The LIGHT-CONE 2017 workshop gathered 80 registered participants including 34 students and young scientists with 21 women scientists. The program included 12 plenary sessions, for a total of 34 invited talks, and 3 parallel sessions, with a total of 16 contributed talks and 15 posters. Young scientists delivered 20% of the plenary talks, 45% of the contributed talks and 90% of the poster presentations. The workshop participants also included researchers from the University of Mumbai, the Tata Institute of Fundamental Research and the IIT, Bombay.

The topics of the scientific program were: Hadron Physics at present and future colliders; Light Front Field Theory in QED and QCD; AdS/QCD, D Branes and Strings; Hadron Structure: TMDs and GPDs; Lattice QCD; QCD at high temperature and density; and Higher order QCD corrections.

The workshop addressed new frontiers and challenges in hadron physics, both in experiment and in theory. Most recent methods of light-front physics were presented such as in the talks by James Vary (Iowa State University) on Hadron Spectra, Scattering Properties and Decay from Basis Light-Front Quantization; by Chueng Ji (NCSU) on Interpolating Electrodynamics; and by Wayne Polyzou (University of Iowa) on Multiscale Methods in QFT.

Hadron structure was discussed in the talks by Wally Melnitchouk (JLab), Towards a universal QCD analysis of parton distribution functions and fragmentation functions; Tobias Frederico (ITA, Brazil), Minkowski Space Structure of Hadrons; Pankaj Jain (IIT, Kanpur), End Point Model for Exclusive Hadronic Processes; and Shunzo Kumano (KEK, Japan), Hadron Tomography and Its Applications to Gravitational Interaction Radii of Hadrons.

Lattice field theory and lattice QCD results were discussed by Asit De (SINP, Kolkata), QFT on Lattice and Bipasha Chakraborty (JLab), Resonances in Coupled Channel Scattering from Lattice QCD. Relativistic Heavy Ion Collisions were discussed in the talk by Ajit Srivastava (IOP, Bhubaneswar), CMBR Power Spectrum and Flow Fluctuations in Relativistic Heavy ion collision) .

Methods in higher-order QCD corrections were presented in talks by Chris White (Queen Mary University of London), Wilson Lines and Webs in Higher-Order QCD and Anuradha Misra (University of Mumbai), Soft Collinear Effects in Threshold and Joint Resummation.

A number of talks were presented on the spin structure of the proton and single spin asymmetries such as by Mauro Anselmino (Torino University), Exploring the 3D Nucleon Structure in Momentum Space; Piet Mulders (University of Amsterdam), Transverse Degrees of Freedom in QCD: Moment, Spins and More; and Rohini Godbole (IISc, Bangalore), Heavy Flavour Production as the Probe of Gluon Sivers Function in  $lp^\uparrow$  and  $pp^\uparrow$  Processes.

Present experimental status and future plans were highlighted in the keynote address by Robert McKeown (JLab, JLab Science - A New Era at 12 GeV, as well as in planery talks by

Abhay Deshpande (Stony Brook University), The Science and Opportunities at the US Electron Ion Collider; Pralay Mal (NISER, Bhubaneswar), Highlights from the CMS Experiment; Ivana Hristova (Humboldt University of Berlin), Future Plans of the ATLAS Collaboration for the HL-LHC; and Carlos Camacho (IPN-Orsay), New Results on Hard Exclusive Processes, to name a few. Other recent results were presented in other contributed talks and posters.

In the closing session, Stan Brodsky gave an overview of Light Front (LF) Holography entitled Supersymmetric Properties of Hadron Physics from LF Holography and Superconformal Algebra and other aspects in LFQCD.

A half-day excursion comprised a visit to the Discovery of India exhibition at Nehru Centre and the heritage building of the Convocation Hall of the University of Mumbai where the Gary McCartor award ceremony was held. Chueng Ji, ILCAC Chair, together with Anuradha Misra, LIGHT-CONE 2017 chair, presented the awards to the two 2017 McCartor Fellowship recipients. James Vary, member of the ILCAC Board of Directors, gave a short address about the history and objectives of the McCartor Fellowships. This was followed by the conference dinner on the scenic sea side by the Gateway of India at the Bombay Presidency Radio Club.

The Proceedings of the workshop will be refereed and published as a special issue (Topical Collection) of Few-Body Systems.

## 9.2 Workshop on Pion-Kaon Interactions

(Communicated by Moskov Amaryan [mamaryan@odu.edu](mailto:mamaryan@odu.edu), James Ritman [j.ritman@fz-juelich.de](mailto:j.ritman@fz-juelich.de), and Igor Strakovsky [igor@gwu.edu](mailto:igor@gwu.edu))

From February 14-15, 2018, the Thomas Jefferson Laboratory in Newport News, Virginia hosted PKI2018, an international workshop to explore the physics potential to investigate  $\pi - K$  interactions. This was the fourth of a series of workshops held to establish a neutral kaon beam facility at JLab Hall D with a neutral kaon flux which will be three orders of magnitude higher than was available at SLAC. This facility will enable scattering experiments of  $K_L$  off both proton and neutron (for the first time) targets in order to measure differential cross section distributions with the GlueX detector.

The combination of data from this facility with the self-analyzing power of strange hyperons will enable precise partial-wave analyses (PWA) in order to determine dozens of predicted  $\Lambda^*$ ,  $\Sigma^*$ ,  $\Xi^*$ , and  $\Omega^*$  resonances up to 2.5 GeV. Furthermore, the  $K_L$  facility will enable strange meson spectroscopy by studies of the  $\pi - K$  interaction to locate pole positions in the  $I = 1/2$  and  $3/2$  channels. Detailed study of the  $\pi - K$  system with PWA will allow observation and measurement of quantum numbers of missing kaon states, which in turn will also impact Dalitz plot analyses of heavy meson decays, as well as tau-lepton decays with  $\pi - K$  in the final state.

The 2018 workshop was organized by Jefferson Lab with additional support from The George Washington and Old Dominion Universities as well as Forschungszentrum Juelich (FZ Juelich).

The organizing committee was chaired by Moskov Amaryan (ODU) along with Ulf-G. Meissner (U. Bonn/FZ Juelich), Curtis Meyer (CMU), James Ritman (Ruhr-Univ.-Bochum/FZ Juelich) and Igor Strakovsky (GWU). The workshop attracted 48 registered participants. Most of the young scientists were provided with financial support to defray costs for lodging and the conference registration fee. The program consisted of 26 invited plenary talks over 8 sessions.

The program of the workshop had special emphasis on topics connected to the proposed  $K_L$



facility experiments. A detailed description of the workshop, including the scientific program, can be found on the workshop web page, <https://www.jlab.org/conferences/pki2018/>. Written versions of talks, presented in the form of mini-proceedings will be available on the arXiv.

The talks presented at this workshop were grouped into the following categories:

- The  $K_L$  Facility at JLab;
  - Lattice QCD approaches to  $\pi - K$  interactions;
  - Results from Chiral Effective Theories;
  - Results from Dispersion Relations;
  - $\pi - K$  form factor and heavy meson and tau decays;
  - Hadron Spectroscopy at GlueX, CLAS, CLAS12, BaBar, and COMPASS.
- 

## 10 State of the Laboratories

### 10.1 RHIC Run 18

(Communicated by Jamie Dunlop – [dunlop@bnl.gov](mailto:dunlop@bnl.gov).)

As I'm writing this, I am sitting in the STAR counting house watching clean single cosmic tracks passing through the STAR detector, a real contrast to our usual thousand-track fireworks. RHIC is currently in the process of ramping up towards its 18<sup>th</sup> run, which will focus on the unique magnetohydrodynamics of the nearly perfect fluid.

If one thinks ballistically, the initial system in collisions at RHIC has an angular momentum of thousands of  $\hbar$ . Combined with the low shear viscosity, this initial angular momentum can set up a rich rotational structure of vortices in the fluid as the plasma evolves. We can measure this vortical structure by looking at the polarization of final state particles, such as hyperons, with respect to the overall angular momentum axis. This year, STAR published a paper that found that not only is the plasma created at RHIC the most perfect fluid measured, but it is also the most vortical fluid, with an average vorticity far higher than any previously observed.

When one thinks about the Quark Gluon Plasma, one usually thinks about it as a QCD plasma, in which deconfinement and chiral symmetry restoration allow the strong force to act on unbound carriers of QCD color charge. But the plasma created at RHIC is also a QED plasma, with an overall charge and magnetic structure driven by the positive charges of the incoming nuclei. If one thinks of these nuclei as two incoming currents, separated by a finite distance, the magnetic field they create is immense, up to  $10^{15}$  G. When combined with chiral symmetry restoration and QCD-induced chiral anomalies, these initial conditions can set up a rich set of magnetohydrodynamic phenomena, such as the Chiral Magnetic Effect, in which, contrary to the simple right-hand rule, a magnetic field induces a current along, rather than perpendicular to, its direction. Such a situation manifestly violates parity, but is allowed due to local fluctuations in chirality.

This year's RHIC run is targeted at looking at these magnetic phenomena in detail. Since the first publication in 2009 of "Possible Local Strong Parity Violation", measurements sensitive to the Chiral Magnetic Effect have suffered from possibly large, difficult to control

backgrounds from more mundane effects. This has led to a decade's worth of discussion and measurements over a wide range of systems, from  $p + A$  to U+U, over three orders of magnitude in energy from the lowest RHIC energy to the highest energy of the LHC, with, to date, an unclear conclusion. In the first part of this year's RHIC run, we will run a clean control experiment, in which we vary only the magnetic field, by colliding isobars, nuclei of the same total nucleon number but different charge. The two collision systems, Ru+Ru vs. Zr+Zr, were chosen to maximize the difference in charge, and therefore initial magnetic field. The length of the run is chosen so that, if a reasonable fraction of the measurement is due to signal from the Chiral Magnetic Effect, we will see a statistically significant difference between the two isobar systems, clearly due to changing only the magnetic field.

Technically, the ability to collide these isobars and limit systematic effects will be a tour de force. The natural abundance of  $^{96}\text{Ru}$  is small, 5.52%, so to make beams of sufficient luminosity we needed enriched sources, which until this year did not exist in large enough quantities. The new Stable Isotope Production Facility (SIPF) at ORNL pulled out all stops to produce this critical resource, in time and at sufficient quantity for a successful run. In order to keep systematic errors from time-dependent changes in detector performance low, RHIC will switch daily between Zr+Zr and Ru+Ru. Operationally, this is a huge step forward in flexibility, converting a switch that in the past would take several days into one that takes a few minutes.

The second part of the RHIC run will focus on a high statistics measurement of global hyperon polarization at  $\sqrt{s_{NN}} = 27 \text{ GeV}/A$ , in order to more deeply probe the vortical structure of the perfect fluid and potentially measure directly the magnetic fields at late time. While the initial magnetic field at first impact is easy to estimate, the evolution of the magnetic field over the lifetime of the plasma is much less well constrained, since it depends sensitively on parameters of the plasma such as its conductivity. Besides placing fundamental constraints on the structure of the plasma, knowledge of the evolution of the magnetic field over the lifetime of the plasma is essential to interpreting anomalous phenomena such as the Chiral Magnetic Effect.

Vorticity in the fluid is measured by the overall spin polarization of quarks and antiquarks, transferred from rotational motion in the vortices into spin polarization of the individual particles. But strong magnetic fields can also polarize particles, and the overall direction of the initial magnetic field is set by the same geometry as the overall direction of the initial angular momentum. While vortices in the fluid transfer spin to quarks and antiquarks alike, magnetic fields in the plasma act oppositely on quarks and antiquarks due to their opposite charge. By separately measuring hyperon and anti-hyperon polarization, one can separate the polarization due to vorticity, seen as the average between hyperons and anti-hyperons, from that due to the magnetic field, seen as the difference. This polarization signature would be sensitive to magnetic fields over the full evolution time of the plasma. Measurements to date show hints of a difference, but not significant enough to make a claim. This year's run should make those hints into a significant measurement.

The measurement at  $27 \text{ GeV}/A$  is the first of a suite of measurements that will happen in the coming years at lower energy in the Beam Energy Scan Phase 2. A new detector, the Event Plane Detector (EPD), has been fully installed in STAR to greatly improve the significance of this measurement. This SiPM-based, highly granular particle counter greatly improves the resolution of the measurement of the event plane against which the polarization is measured, hence improving the significance of the result in a far more effective way than just running longer.

The EPD is the first of three detector upgrades for STAR, all of which will increase STAR's coverage to maximize the reach of the measurements. For the first time in 20 years, STAR has opened up its Time Projection Chamber (TPC) to replace one (out of 24) inner endcap sectors. This year will be used to fully commission that sector, in preparation for the installation of the full set before next year. This upgrade, named the iTPC, will dramatically increase STAR's capability to search for a conjectured QCD critical point by increasing the significance of fluctuation measurements that scale cubically with the number of particles measured in an event. An associated upgrade, the Endcap Time of Flight (eTOF), will extend full particle identification into the region covered by the iTPC, further enhancing the measurement, and also enabling STAR to make similar measurements in both fixed-target and collider mode to extend the critical point search to higher baryon density. The eTOF also serves prototype purposes for CBM at FAIR, allowing the detector developed for CBM to be tested and used for physics early, under the FAIR Phase 0 program.

On the accelerator side, two focused electron accelerators have been placed in the RHIC tunnel. The first, a Proof of Principle demonstrator of Coherent Electron Cooling, is on its third year. This serves as important R&D for a future Electron Ion Collider (EIC), as Coherent Electron Cooling, which conceptually combines traditional electron cooling of hadron beams with stochastic cooling, would greatly enhance the EIC's luminosity reach. The second, Low Energy RHIC Electron Cooling (LeREC), is the enabling technology of Beam Energy Scan Phase 2, increasing the luminosity of RHIC collisions at the lowest energies relevant to the search for the QCD critical point. LeREC is at the end of its construction stage and is in commissioning in preparation for use in next year's run.

In conclusion, RHIC continues to use, and improve, its unparalleled flexibility to probe the structure of the most perfect, and now most vortical, fluid we can create and observe. Eighteen years in, we can still be surprised, and rapidly move to turn surprise into detailed understanding.

## 10.2 The Year 2017 at Jefferson Lab

(Communicated by Bob McKeown – [bmck@jlab.org](mailto:bmck@jlab.org))

The 12 GeV upgrade project is now complete, with official approval from DOE on 27 September 2017. Start of accelerator operations for physics and commissioning was scheduled for fall 2017, but reliable beam operation required significant effort during this period. However, a major achievement was simultaneous delivery of beam to all four experimental halls for the first time. Beam operations commenced in January 2018 with substantially improved performance and an expected 10 weeks of beam delivery in Spring 2018. All four Halls are now in physics production mode.

### *Science Highlights*

The Qweak result on the precise determination of the weak mixing angle  $\sin^2 \theta_W$  to test the standard model has been submitted to Nature and has been reported at several conferences. The result is in good agreement with the standard model.

Hall B has published a PRL on the first measurement of a nuclear GPD through measurement of exclusive DVCS on 4He using data from the 6 GeV era of CEBAF. This demonstrates the feasibility of 3D tomographic imaging for nuclear targets, which will be pursued with CLAS12. (See <http://dx.doi.org/10.1103/PhysRevLett.119.202004>.)

Hall B has produced a Nature article (accepted) on a measurement of the pressure distribution experienced by the quarks in the proton. A strong repulsive pressure near the protons center is accompanied by a binding pressure at greater distance. The average peak pressure near the center is about  $10^{35}$  Pascal, which exceeds the pressure estimated for the most densely packed known objects in the universe, neutron stars.

Jefferson Lab Lattice theorists and collaborators published the first lattice QCD study of the gluonic structure of light nuclei in Physical Review D. The results indicate a significant signal for structure associated with gluon transversity in the deuteron, a tensor observable that could be determined in future experiments at JLab and/or an electron ion collider. (See <http://dx.doi.org/10.1103/PhysRevD.96.094512>.)

A Nature Communication was published on proton DVCS data acquired in Hall A during the 6 GeV era of CEBAF. They report a full determination of the BH-DVCS interference by exploiting the distinct energy dependences of the DVCS and BH amplitudes. In the regime where the scattering is expected to occur off a single quark, measurements show an intriguing sensitivity to gluons. (See [doi:10.1038/s41467-017-01819-3](https://doi.org/10.1038/s41467-017-01819-3).)

Jefferson Lab theorists and collaborators, including the Jefferson Angular Momentum (JAM) Collaboration have reported the first global QCD analysis of the quark transversity distributions in the nucleon from semi-inclusive deep-inelastic scattering (SIDIS), using a new Monte Carlo method based on nested sampling and constraints on the isovector tensor charge  $g_T$  from lattice QCD. (See <https://arxiv.org/abs/1710.09858>, submitted to PRL.)

#### *2018 Schedule*

In spring 2018 Hall A will run the MARATHON experiment to provide a precise determination of the  $d/u$  ratio at high  $x$ . Hall B will complete commissioning and begin acquiring data on a liquid hydrogen target for the set of measurements in Run Group A, including DVCS, SIDIS, hyperon production, and hadron spectroscopy. Hall C will perform measurements of color transparency in the  $(e, ep)$  reaction, structure functions in the resonance region and on light nuclei, transverse momentum dependence of semi-inclusive pion production, and deuteron electrodisintegration. Hall D will acquire additional GlueX data to search for exotic mesons.

#### *Other Projects*

The Super BigBite Spectrometer construction is complete, with further work in progress on the polarized  $^3\text{He}$  target required for the neutron form factor measurements.

The SoLID (Solenoidal Large Intensity Device) collaboration had a Directors Review 23-4 February 2015. The collaboration has updated its pre-CDR document to address all recommendations, and is awaiting a decision on a science review by DOE Office of Nuclear Physics.

One sector of the RICH detector built to enhance the CLAS12 PID capabilities, a project led by INFN, has been installed in January 2018 for the ongoing CLAS12 program. Construction of a second RICH sector, and the Neutral-Particle Spectrometer in Hall C, are ongoing.

DIRC bars from the Babar experiment at SLAC have been received at JLab for use with the GlueX experiment, and will be installed in the next year. This will enable GlueX to enhance its particle identification capability.

MOLLER has CD0 approval from DOE but is in a paused state due to budgetary uncertainties.

Development of Jefferson Lab Electron Ion Collider (JLEIC) concept continues with emphasis

on high luminosity ( $> 10^{34} \text{ cm}^{-1} \text{ sec}^{-1}$ ) and high polarization (including deuterons). A pre-CDR document is under development and scheduled to be complete in FY18. We are consolidating the local physics, theory and computation effort by establishing a center for these activities: Electron Ion Collider Center, or EIC2@JLab.

We have submitted a proposal to the state of Virginia to establish a Center for Nuclear Femtography which will involve a consortium of Virginia Universities in a coordinated effort to develop this subject to an advanced state and capitalize on the extensive new dataset that will be available from operation of CEBAF at 12 GeV, and also future facilities such as an Electron Ion Collider.

*Program Advisory Committee*

PAC46 will be held the week of 16 July 16 2018, and will review newly submitted proposals, letters of intent, and previously conditionally approved proposals. The deadline for submission of proposals and updates is 8:00 a.m. EDT (Eastern Daylight Time) on Monday, 4 June 2018. Additional information is available at [https://www.jlab.org/exp\\_prog/PACpage/PAC46/PAC46.html](https://www.jlab.org/exp_prog/PACpage/PAC46/PAC46.html).

Acknowledgment: I would like to thank Rolf Ent, Patrizia Rossi, and Jianwei Qiu for their assistance in preparing this report.

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## 11 Forthcoming Hadron Physics Meetings

Meetings of interest to GHP's membership are listed at Mark Manley's page: <http://cmr2.kent.edu/manley/BRAGmeetings.html>. In this connection, if there is a meeting you feel should be included, please send the appropriate information to John Arrington ([johna@anl.gov](mailto:johna@anl.gov)) or Mark Manley ([manley@kent.edu](mailto:manley@kent.edu)).

The following list is based on Mark's page:

- POETIC 8: 8<sup>th</sup> *International Conference on Physics Opportunities at an ElecTron-Ion-Collider* (Regensburg, Germany, 19-22 March 2018) <https://indico.cern.ch/event/663878/>
- 32<sup>nd</sup> Meeting of the A2/Crystal Ball Collaboration (Glasgow, Scotland, 9-11 April 2018)
- APS April Meeting (Columbus, OH, USA, 14-17 April 2018) <http://www.aps.org/meetings/meeting.cfm?name=APR18>
- ECT\* Workshop on Exposing Novel Quark and Gluon Effects in Nuclei (ECT\*, Trento, Italy, 16-20 April 2018) <http://www.ectstar.eu/node/4211>
- INT Program INT-18-1b: Multi-Scale Problems Using Effective Field Theories (INT, Seattle, WA, USA, 7 May - 1 June 2018) <http://www.int.washington.edu/PROGRAMS/18-1b/>
- ECT\* Workshop on Foundational aspects of relativistic hydrodynamics (ECT\*, Trento, Italy, 7-11 May 2018) <http://www.ectstar.eu/node/4213>
- Quark Matter 2018: 27<sup>th</sup> *International Conference on Ultrarelativistic Nucleus-Nucleus Collisions* (Venice, Italy, 13-19 May 2018) <https://qm2018.infn.it/>

- Light Cone 2018 (Jefferson Lab, Newport News, VA, USA, 14-18 May 2018) <https://www.jlab.org/conferences/lightcone2018/>
- CHARM 2018: *The 9<sup>th</sup> International Workshop on Charm Physics* (Novosibirsk, Russia, 21-25 May 2018) <http://charm18.inp.nsk.su/>
- ECT\* Workshop on Probing QCD at the High-Energy Frontier (ECT\*, Trento, Italy, 21-25 May 2018) <http://www.ectstar.eu/node/4213>
- CIPANP18: 13<sup>th</sup> Confernece on the Intersections of Particle and Nuclear Physics (Indian Wells, CA, USA, 28 May - 3 June 2018)
- Real Time Computing Conference (Jefferson Lab, Newport News, VA, USA, 11-15 June, 2018) <https://indico.cern.ch/event/543031>
- INT Program INT-18-2a: Fundamental Physics with Electroweak Probes of Light Nuclei (INT, Seattle, WA, USA, 12 June - 13 July 2018) <http://www.int.washington.edu/PROGRAMS/18-2a/>
- CTEQ School on QCD and Electroweak Phenomenology (Mayaguez, Puerto Rico, USA, 18-28 June 2018) <http://www.physics.smu.edu/scalise/cteq/schools/summer18/>
- HYP 2018: *13<sup>th</sup> International Conference on Hypernuclear and Strange Particle Physics* (Norfolk, VA, USA, 24-29 June 2018) <https://www.jlab.org/conferences/hyp2018>
- ECT\* Workshop on Nucleon Spin Structure at Low  $Q$ : A Hyperfine View (ECT\*, Trento, Italy, 2-6 July 2018) <http://www.ectstar.eu/node/4219>
- FB22: *XXII International Conference on Few-Body Problems in Physics* (Caen, France, 9-13 July 2018) <https://fb22-caen.sciencesconf.org/>
- Lattice 2018: *36<sup>th</sup> International Symposium on Lattice Field Theory* (East Lansing, MI, USA, 22-28 July 2018) <http://www.pa.msu.edu/conf/Lattice2018/>
- Gordon Research Conference on Photonuclear Reactions (Holderness, NH, USA, 5-10 August 2018) <http://www.grc.org/programs.aspx?id=11907>
- ECT\* Workshop on Mapping Parton Distribution Amplitudes and Functions (ECT\*, Trento, Italy, 10-14 September 2018) <http://www.ectstar.eu/node/4223>
- Hard Probes 2018: *International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions* (Aix-Les-Baines, Savoie, France, 1-5 October 2018) <https://indico.cern.ch/event/634426/>
- 5<sup>th</sup> Joint Meeting of the APS DNP and the Physical Society of Japan (Waikoloa, HI, USA, 23-27 October 2018) <http://www.aps.org/meetings/meeting.cfm?name=HAW18>
- QNP2018: 8<sup>th</sup> Internatioal Conference on Quarks and Nuclear Physics (Tsukuba, Japan, 13-17 November 2018) <http://www-conf.kek.jp/qnp2018/>
- NN2018: 13<sup>th</sup> International Conference on Nucleus-Nucleus Collisions (Omiya, Saitama, Japan, 4-8 December 2018) <http://nn2018.riken.jp>
- INT Program INT-19-1b: Origins of Correlations in High Energy Collisions (INT, Seattle, WA, USA, 29 April - 24 May 2019) <http://www.int.washington.edu/PROGRAMS/19-1b/>

- INT Program INT-19-2b: Heavy Quark Physics and Fundamental Symmetries (INT, Seattle, WA, USA, 12 August - 6 September 2019)  
<http://www.int.washington.edu/PROGRAMS/19-2b/>

GHP members might also be interested in other conferences and workshops listed at the following sites:

- ECT\* ... [www.ectstar.eu](http://www.ectstar.eu)
- INT ... [www.int.washington.edu/PROGRAMS/programs\\_all.html](http://www.int.washington.edu/PROGRAMS/programs_all.html)
- JLab ... [www.jlab.org/conferences](http://www.jlab.org/conferences)

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**\* Disclaimer \***

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