

## **Minutes of the 2020 GPMFC Executive Committee Meeting**

Held virtually due to the COVID-19 pandemic

Thursday, June 4<sup>th</sup>, 2020, 12:30 p.m. – 2:00 p.m. Pacific

### **Present:**

- Susan Gardner (Chair 2019-2020)
- Derek Kimball (Chair-Elect 2019-2020)
- David Hanneke (Vice-Chair 2019-2020)
- Mike Snow (Vice-Chair-Elect 2020-2021)
- Thad Walker (Past-Chair 2019-2020)
- Eric Burt (Secretary/treasurer 2019-2022)
- Andrew Geraci (Member-at-large 2017-2020)
- Alex Sushkov (Member-at-large 2017-2020)
- Matt Dietrich (Member-at-large 2018-2021)
- Shannon Hoogerheide (Member-at-large 2018-2021)
- Jaideep Singh (Member-at-large 2019-2022)
- Beatrice Franke (Member-at-large-Elect 2020-2023)
- Joan Marler (Member-at-large-Elect 2020-2023)

**Meeting started at 12:30 p.m.**

### **Agenda**

1. Welcome & Overview of Group Activities (Gardner)
2. Secretary/Treasurer Report (Burt)
  - a. Election
  - b. Finances
  - c. Membership
  - d. News
3. Student Poster Competition Winners (Dietrich/Geraci)
4. Council Report (Schultz)
5. GPMFC Workshop Future & Proposed Bylaw Change? (Gardner)
6. Other news

### **Welcome (Gardner)**

Membership scientific achievements are recognized through the GPMFC Student Poster Competition, 2020 Fellowship, and GPMFC prizes and awards (see later in the minutes for more detail on each of these). Each of these were described. Coupons for free GPMFC membership will be available for a limited time starting in June, 2020. The Secretary/Treasurer will distribute details when they become available from the APS.

### Prizes and Awards

The 2020 Norman F. Ramsey Prize was awarded to Phil Bucksbaum (Stanford) for "*For pioneering explorations of ultrafast strong field physics from the optical to the X-ray regime.*"

The Francis M. Pipkin Award is awarded in odd-numbered years. The next award will be in 2021.

### **Secretary/Treasurer's Report (Burt)**

#### Election Results

Mike Snow (Vice Chair), Beatrice Franke (Member-at-Large), and Joan Marler (Member-at-Large) have been elected to the GPMFC Executive Committee. Their terms will commence on October 1, 2020. 144 votes were cast in the 2020 election representing 29% of the membership at the time of the election. This participation in the election was a slight increase over years past.

The executive Committee thanked the Nominating Committee of Shannon Hoogerheide (chair), David DeMille, and Liang Yang for their work in developing an excellent slate of candidates.

It was noted that while the voting period of 1 week was shorter than in previous years, this was a sufficient period based on vote per day data. It is recommended however that next year's election be started earlier, ideally 1-2 months before the 2021 April APS conference.

#### The 2020-2021 Executive Committee membership is:

<b>Chair</b>	Derek Kimball
<b>Chair-Elect</b>	David Hanneke
<b>Vice-Chair</b>	Mike Snow
<b>Past Chair</b>	Susan Gardner
<b>Secretary/Treasurer</b>	Eric Burt (2019-22)
<b>Members At Large</b>	Matt Deitrich (2018-21)
	Shannon Hoogerheide (2018-21)
	Jaideep Singh (2019-22)
	Lindley Winslow (2019-22)
	Beatrice Franke (2020-23)
	Joan Marler (2020-23)

#### Finances

As of April, 2020, the GPMFC account had a balance of \$38,168. Conferences and the GPMFC workshop make up the largest sources of revenue, via conference registration fees, and expenses for food and beverages. In 2020, both DAMOP and the GPMFC workshop were held virtually via Zoom. Conference and workshop registration were free so there was no income from these, but there was also no food expense. The result is that the overall group account balance is fairly flat since 2019.

The annual Student Poster Competition was continued in 2020 (see below for details). Two prizes of \$500 each were awarded in 2020 as in previous years. The APS manages the group's account and normally investment income is about equal to the Student Poster Competition awards. This may not be the case in 2020 due to the huge stock market fluctuations, but the overall balance can easily absorb this perturbation.

Going forward, the GPMFC have the resources to consider funding additional GPMFC-related activities. One possibility put forward was student travel grants. This will be taken up in future EC meetings.

### Membership

The current GPMFC membership is 519, lower than last year's number of 558, however the APS informed us that the difference is at the level of variation over the year, so it may not be significant. While overall membership may be slightly lower, representation from the major divisions are all up (DAMOP: 266 to 311, DNP: 107 to 123, DLS: 115, and DPF: 84 to 113).

While overall membership is healthy, the demographics are not as positive. Female membership in the GPMFC is 14.1%, which is up from previous years, but lower than many other topical groups and divisions, notably DBIO (23.5%), DSOFT (23.2%), DAP (21.4%), GPER (31.5%), and GMED (30.3%).

### **Student Poster Competition Report (Dietrich and Garaci)**

All students who submit a poster to the main DAMOP (or April) poster session are eligible to submit a separate abstract for that poster for consideration in the GPMFC competition. In 2020 there were 11 submissions and 6 finalists. In addition to the selection committee of Matt Dietrich and Andy Geraci, the judges included Nick Hutzler, Andrew Jayich, Jaideep Singh, and Alex Sushkov. The winners of the 2020 competition were Eddie Chang of UCLA, "The HUNTER Sterile Neutrino Search Experiment: 131-Cs Magneto-Optical Trap Development," and Ethan Clements of NIST Boulder, "Beyond the Laser Coherence Limit: Improving Frequency Ratio Measurements in Search of New Physics."

### **APS Council Report (Schultz)**

David Schultz is the APS councilor for GPMFC (and DAMOP). The council's responsibilities include, establishment and oversight of society publications, approval of policy statements and society science strategy, scientific meetings and conferences, admission of members and election of fellows, all prizes and awards, and final approval of any amendments to the constitution and bylaws.

The APS councilors meet in November, April, and September.

### Highlights of the November Council Meeting

The councilors received feedback from the units on their annual meetings (see below). The councilors voted to establish the Forum on Diversity and Inclusion. The committee

on the Status of Women in Physics and the committee on Minorities “Climate Site Visits” program were reviewed. The APS Innovation Fund received 100 proposals with 4 selected. The changes in the Annual Leadership Meeting were discussed.

#### Feedback from GPMFC on the April and DAMOP annual meetings

GPMFC members indicated that what works in the April meeting is the diversity of topics and excellent plenary sessions as well as highlighted sessions where all speakers have longer time allotments and are oriented towards addressing a broader audience. Membership listed DAMOP’s extended poster session among the things that work well in that conference.

Among aspects that don’t work as well, membership indicated that the April meeting is very “scheduled” so that it is difficult to find time for discussions. April meeting sessions sometimes run into coffee breaks or lunch, thereby also limiting discussion opportunities.

Vital aspects of the April meeting, as well as unit meetings, are the opportunities given to students to present, meet other students and interact with a broad range of scientists. Members indicated that DAMOP’s poster sessions also met this same objective.

Suggestions for improvements to annual meetings included: Improve coordination of parallel sessions that overlap within a discipline and seek to increase cross-disciplinary topics at DAMOP.

#### Feedback from the DAMOP membership

Poster sessions work very well with no parallel sessions, snacks/drinks. It is a great venue for interaction. The DAMOP meeting length is budget-friendly. The number of attendees and sessions is appropriately sized. The opportunities for students and postdocs to give talks is much appreciated. DAMOP members pointed out that some meeting rooms are poorly set up: not sized appropriately, with access to seating difficult, and too much light near projection screens. Some members felt that there are too many sessions held in parallel, but recognized that as a necessary consequence of the meeting length. Coffee breaks should be given much more space. DAMOP members indicated that student and postdoc involvement is vital, as is an open nomination process for invited talks and a relatively small/intimate meeting scale. One recommended improvement is to increase the size of the room that hosts the Thesis Prize session, since this is very heavily attended.

#### April Council Meeting Highlights

- Due to the pandemic, the April council meeting was changed to three virtual meetings
- Briefings, discussions centered on taking the March, April, and subsequent unit meetings virtual (which subsequently took place)
- Office of government affairs continued efforts to assess and influence the state of federal research funding. Address status of graduate students, postdocs, and the tenure clock.

## **Program Report (Gardner)**

In 2019 and 2020, the GPMFC had only one invited session at the April APS meeting. It was pointed out to the APS that this appeared to be out of proportion with the size of the GPFMC membership. So, in 2021 the GPMFC will have two invited sessions. The GPMFC “footprint” is enhanced by coordinating sessions with other groups as well.

At the 2020 April APS virtual conference, there were 6 sessions, either coordinated, co-coordinated, or of particular interest to GPMFC:

- C04 (GPMFC/DNP) Invited – New Insights from Precision Measurements of Weak Interaction Phenomena;
- G03 (GPMFC/DAMOP) Invited – Precision Tests of Fundamental Physics;
- R03 (DAP/GRAV/GPMFC) Invited – New Approaches to  $H_0$ ;
- T11 – Big G and Tests of Gravity;
- Y11 – Quantum Mechanics and General Relativity; and D03 (DAMOP/DAP) Invited – AMO Frontiers in Astrophysics.

At the 2020 DAMOP conference, the GPMFC doesn't have invited sessions, but members of the GPMFC play key roles on the DAMOP program committee. In particular, Derek Kimball was the precision measurement section chair and Alex Sushkov also served. (Alex is our official GPMFC representative on the DAMOP program committee. His term continues into 2021.) Of particular interest to the GPMFC at DAMOP this year were:

- C07 Invited – Searches for Exotic Physics;
- G05 FOCUS: Nuclear Physics Experiments using AMO Techniques;
- H05 Invited – Molecular Spectroscopy with Fundamental Applications;
- M07 Invited – New Developments in Atomic Clocks;
- N07 FOCUS: Advanced Spectroscopy; and
- T07 FOCUS: Ultrasensitive Atomic Sensors.

## **Discussion (Led by Gardner)**

### The annual GPMFC workshop

The first GPMFC workshop was held in 2015, co-joint with the April APS meeting of that year. Since then, it has become an annual event, which alternates between the April APS Meeting and DAMOP so that it is co-joint with the year's GPMFC Executive Committee meeting. Thanks to Marianna Safronova and Dmitry Budker, who with others have co-organized all of these workshops. They have been very popular and successful. The past workshop themes have been:

1. GPMFC/GFB 2015, “Tests of Fundamental Symmetries” [APS April]

- **Marianna Safronova, Mike Snow, Daniel Phillips, Chris Ticknor**, co-organizers
2. GPMFC 2017, ``Ultralight Dark Matter'' [APS April]
    - **John Doyle, Dmitry Budker, Marianna Safronova**, co-organizers
  3. GPMFC 2018, ``Precision Measurement Searches for New Physics'' [DAMOP]
    - **Marianna Safronova and Dmitry Budker**, co-organizers
  4. GPMFC 2019, ``New Ideas in Dark Matter Searches'' [APS April] [GPMFC Program Committee]
    - **Marianna Safronova, Dmitry Budker, Asmina Arvanitaki**, co-organizers
  5. GPMFC 2020, ``Precision Measurement Searches for New Physics'' [DAMOP] [GPMFC Program Committee]
    - **Marianna Safronova, Dmitry Budker, Holger Mueller**, co-organizers

At the 2020 Executive Committee meeting members affirmed proceeding with a GPMFC Workshop in 2021, and reserved the usual pre-meeting slot during the APS April meeting. The 2021 workshop content and organizational plans for subsequent meetings are still under development by the Executive Committee. The results will be shared with the GPMFC membership when appropriate.

## Discussion

Richard Steiner posed the question: In the context of the current redefinition of the fundamental constants, once they are defined precisely, is there any point to further measurement?

Gardner responded by saying that a fundamental constant can typically be extracted from different sorts of experimental setups and that the agreement of those resulting values can be a very sensitive test of the underlying theory. All of this is very much in contrast to the speed of light, which is rightly regarded as a conversion factor in terrestrial experiments. A very good example is the determination of the fine structure constant  $\alpha$ , which can be extracted from the measurement of the anomalous magnetic moment ( $g-2$ ) of the electron or from atom interferometry. The two experiments rely on very different aspects of the underlying theory: the  $g-2$  measurement probes the Standard Model at the level of its quantum corrections, whereas the atom interferometry experiment does not. A disagreement could speak to new physics ingredients in the quantum corrections. There is a mild disagreement ( $\sim 2.4$  sigma) between these two assessments now, and we will have to await the results of further experiments, possibly also from the measurement of  $g-2$  of the positron to see what to make of it. Gerry Gabrielse mentioned this disagreement in his April APS talk. There is also the existing measurement of the  $g-2$  of the muon, which has a much more significant discrepancy from the Standard Model prediction. We are all waiting for the new result from Fermilab to shed light on that. (Here the effects from quantum corrections are numerically much larger.)

**The meeting ended at 2:00 pm Pacific time.**