

APS Division of Astrophysics

Electronic Newsletter

April 2020

The APS April meeting, April 18-21, 2020 is going virtual. Attendance will be free, but registration is needed. Registration will open week of April 13 at <https://april.aps.org>. Since travel is not required and attendance is free and open to all, we anticipate a large turnout and very stimulating talks and discussions. All plenary, almost all invited, and most contributed talks will be given as originally scheduled. Please consult the Epitome closer to April 18 for the final schedule.

The Annual DAP Business Meeting will occur live on Monday, April 20 from 5:30-6:30 pm. Unfortunately this year you have to supply your own hors d'oeuvres and wine. After brief reports on DAP budget and activities, there will be time for community contributions and suggestions for DAP activities. We welcome more light-hearted and socially-oriented contributions such as "It's hard to live up to Newton's standard", or "How Fermi is carrying on", or just an image of a research group on a socially-distanced cycling outing or a video of a grad-student band making music via merging individual tracks. In order to plan, we would like you to sign up by emailing dapsectreas@googlegroups.com by April 19 to indicate your interest.

The DPF is hosting a TownHall on the Snowmass 2021 process; requests to contribute are being accepted up to April 15. See section on Snowmass 2021 below for further details.

In this issue:

- 2020 DAP Election Results
- CPG Dissertation Award Finalists
- DAP Student/Postdoc Travel Awards
- Remote DAP Business Meeting
- APS April Meeting Refunds
- Details of Virtual April Meeting
- Update on SNOWMASS
- DAP highlights in April Meeting

APS DAP Officers 2019–2020 (turnover on April 21, last day of April APS):

- Chair: Joshua Frieman
- Chair-Elect: Glennys Farrar
- Vice Chair: Chris Fryer
- Past Chair: Priyamvada Natarajan
- Secretary/Treasurer: Judith Racusin
- Deputy Sec./Treasurer: Amy Furniss
- Division Councilor: Cole Miller
- Member-at-Large: Marilena Loverde
- Member-at-Large: Tonia Venters
- Member-at-Large: Stefano Profumo
- Member-at-Large: Ignacio Taboada

Questions? Comments?

Newsletter editors:

Amy Furniss

amy.furniss@csueastbay.edu

Judith Racusin

judith.racusin@nasa.gov

Dear DAP,

Please see the April 2020 DAP newsletter. It will be archived on the DAP website (<https://www.aps.org/units/dap/newsletters/index.cfm>). If you have content you'd like to include in a future newsletter or distribute to DAP membership, please send it to us at dapsectreas@googlegroups.com.

For questions, suggestions, feedback, please contact the DAP Executive Committee at dap-exec@googlegroups.com

2020 DAP Election Results

We are pleased to announce the outcome of the recent DAP Executive Committee election.

New members of the committee:

Vice Chair: **Dan Holz (University of Chicago)**

Members-at-Large: **Erin Kara (MIT), Laura Blecha (University of Florida)**

Congratulations to these colleagues, a sincere thank you to all of the individuals who stood willing to serve, and a thank you also to all DAP members who voted. These new members will join the DAP executive committee starting at the May telecon, in lieu of the usual in-person meeting at the April APS.

We also thank our outgoing DAP Executive Committee members for their years of service: **Priya Natarajan (Chair line), Toni Venters, Marilena Loverde.**

Cecilia Payne-Gaposchkin Doctoral Dissertation Award in Astrophysics

We received excellent nominations for the DAP thesis prize, and the committee has selected three finalists to present at the April meeting. The finalists and their citations are below. Please join this excellent session to hear them speak. The winner will be announced at the DAP Business Meeting. For 2020, the finalists are:

Nicholas Rodd, for developing techniques to search for dark matter signals in astrophysical datasets, for characterizing the excess of GeV gamma-rays from the inner Milky Way, and for predictions of astrophysical signals from complex dark sectors and heavy weakly-interacting dark matter.

Anna Ogorzalek, for ground breaking work in the use of X-ray measurements to probe the velocity structure of hot gas in galaxies and clusters, and the physics of AGN feedback.

Jessica Muir, for advancements towards precision cosmology on the largest observable scales.

DAP Student/Postdoc Travel Awards

We received an excellent set of student and postdoc travel award applications for this year's April meeting. Prior to cancellation of the in-person April meeting, we sent out announcements of award to the recipients. Travel awards are available for those who incurred non-refundable expenses prior to cancellation. Remaining awards will be available for deferment until next year's meeting if the awardee attends the 2021 meeting as a postdoc or student.

DAP Business Meeting

a.k.a. Reception and Awards Ceremony

The DAP Business Meeting a.k.a. The Reception and Awards Ceremony at the APS April meeting is scheduled for Monday, April 20 from 5:30-6:30 pm. While you enjoy your drinks and appetizers -- unfortunately self-supplied, this year -- the DAP Executive Committee will give brief reports on the DAP budget and initiatives of the past year including travel awards. The recipient of the Cecilia Payne-Gaposchkin Thesis Award will be announced.

Possible new DAP initiatives for the upcoming year that have been proposed include:

- Helping Phys. Rev. to improve its coverage and refereeing of DAP-related topics.
- Considering ways APS might usefully serve the community by providing resources to deal with harassment or other social problems which arise outside of contexts where there is a clear existing line-of-responsibility such as within a university or lab or at an APS meeting.

Membership opinions and suggestions on these or other topics are most welcome. Please email dap-exec@googlegroups.com if you would like to contribute.

In addition to suggestions for DAP activities in the upcoming year via live zoom, we welcome more light-hearted and socially-oriented contributions such as "It's hard to live up to Newton's standard", or "How Fermi is carrying on", or just an image of a research group on a socially-distanced cycling outing or a video of a grad-student band making music via merging individual tracks. In order to plan, we would like you to email dapsectreas@googlegroups.com by April 19 to indicate your interest.

APS April Meeting Refunds

APS will be processing the majority of the meeting registration refunds no later than April 17, 2020. Upon processing the refund, it may take up to three days for the credit to appear on the credit card from which the payment was initiated.

In addition, each registrant should receive an email from meeting-refunds@aps.org that includes a copy of the refund invoice. It is each registrant's responsibility to provide a copy of the refund invoice to the party who paid for their registration, as applicable.

If you do not receive an email from meeting-refunds@aps.org and/or see the credit on your statement by April 20, 2020, please check my.aps.org under My Orders or feel free to contact meeting-refunds@aps.org and include the following information so we can investigate:

Registrant Name

Registrant ID

Credit Amount Expected

Last four of CC (if known)

Virtual April APS Meeting

The APS April meeting will be held as scheduled, April 18-21, 2020, but virtually. Attendance will be free, but ***registration is required***. Anyone can register including non-APS members. Registration will open next week at <https://april.aps.org>. Please pass on the word to international and other colleagues who would be interested, but might be not following these developments. The talks really are exceptional, with numerous new results to be presented.

All plenary, almost all invited, and most contributed talks (~90%) will be given. The session times will be as originally scheduled. Talks will be live, except in the case of some contributed sessions they will be On-Demand only, consisting of a pre-recorded talk or slides. Live sessions will have Q&A via Zoom Chat and will be recorded and archived for later access. Slides will be available for all talks, and accessible after the start of the session. The [Epitome](#) will indicate which talks are Live and which are On-Demand and have the final time-designation for each talk.

The virtual meeting infrastructure will include tools to create spur-of-the-moment zoom rooms to enable participants to have informal discussions, as during coffee breaks. Session chairs and speakers will receive information from APS during the week of April 13 explaining the mechanics of the sessions, uploading the materials, etc.

This unintended experiment in having a virtual April meeting may enable us to offer a virtual component to the normal in-person meeting in future years. This could have the benefit of enabling more people to attend and broadening participation. We will be soliciting your opinions on how this first experiment works, and how it could be improved, after this meeting.

We owe deep thanks to the APS program team, especially Mark Doyle, without whose herculean efforts having live virtual presentations of 1000 talks in hundreds of different sessions would have been unimaginable. And thanks as well are due the APS Council for refunding all of the registration fees and absorbing the total cost of this meeting.

Glennys Farrar
DAP Program Chair

Snowmass 2021 Process

Over the next year, the U.S. particle physics community under the leadership of the Division of Particles and Fields will be engaged in Snowmass 2021, an in-depth process to define the most important questions for the field and to identify the most promising opportunities to address these questions in a global context. The Snowmass Steering Committee consists of the DPF Executive Committee chair-line, with representatives from related APS units Glennys Farrar (DAP), Gabriela Gonzalez (DGRAV), Yury Kolomensky (DNP) and Sergei Nagaitsev (DPB).

To optimally engage all participants in the process, the international community is invited to submit written documents as described below. Given the increasing importance of interdisciplinary work in related fields such as astrophysics, cosmology, gravity, nuclear physics, accelerator physics, AMO, and materials science, members of the Divisions of Astrophysics, Gravitational Physics, Nuclear Physics, Physics of Beams and members of other units with a connection to particle physics are strongly encouraged to participate in this process.

The Snowmass process will be bracketed by a Snowmass Planning Meeting at Fermilab on November 4 - 6, 2020, and ending with a Snowmass Summer Study at the University of Washington, Seattle, on July 11 - 20, 2021. The website <https://snowmass21.org/start> gives extensive further details. Particular points of note:

Letters of Interest (submission period: April 1, 2020 – August 31, 2020)

Letters of interest allow Snowmass conveners to see what proposals to expect and to encourage the community to begin studying them. They will help conveners to prepare the Snowmass Planning Meeting that will take place on November 4 - 6, 2020 at Fermilab. Letters should give brief descriptions of the proposal and cite the relevant papers to study. Instructions for submitting letters are available at <https://snowmass21.org/loi>. Authors of the letters are encouraged to submit a full writeup for their work as a contributed paper.

Contributed Papers (submission period: April 1, 2020 – July 31, 2021)

Contributed papers will be part of the Snowmass proceedings. They may include white papers on specific scientific areas, technical articles presenting new results on relevant physics topics, and reasoned expressions of physics priorities, including those related to community involvement. These papers and discussions throughout the Snowmass process will help shape the long-term strategy of particle physics in the U.S. Contributed papers will remain part of the permanent record of Snowmass 2021. Instructions for submitting contributed papers are available at <https://snowmass21.org/submissions/>.

Snowmass Town Hall meeting

Your contributions and participation are critical for the success of Snowmass, and via this Town Hall meeting, we look forward to hearing many and diverse voices concerning the Snowmass process. Please see below further information.

Time and Date

- 5:30 - 7:00 pm EDT, Saturday, April 18, 2020

Agenda

- (30') Status and Plan for Snowmass - Young-Kee Kim
- (30') Open Mic with presentations by community members (including comments or questions)
- (30') Answers by the Snowmass Steering Group or Snowmass Conveners

Procedure to participate in the Open Mic Session

Each speaker will have a 2 min limit. A request should be sent to ykkim@hep.uchicago.edu with (1) a subject line "Contribution to Snowmass Town Hall Meeting" and (2) a written document that you want to present at the Town Hall meeting (this document should not exceed 250 words) by 11:59 pm EDT on **Wednesday, April 15**. Speakers will be chosen in the order in which their request is submitted. However, we will try to avoid duplicate presentations and to produce balanced presentations between Snowmass Frontiers (<https://snowmass21.org/>).

Virtual connection

- The APS April meeting website (<https://april.aps.org/>) will guide you when virtual sessions are set up. This event will be open to all.

DAP Highlights April APS Meeting, 2020

(check [Epitome](#) for updates)

April 18-21 (Sat 8:30 am - Tues 3:30 pm)

Plenary Program (Han Tao, April Meeting Program Chair)

Kavli Keynote Plenary: Exploring the Cosmos (8:30am, April 18, Saturday)

- James Peebles (Princeton Univ.)
- Michel Mayor (Univ. of Geneva)
- The Three-Legged Stool -- Eric Cornell (JILA, Univ. of Colorado)

Plenary II: Multi-messenger Probes of Fundamental Physics (8:30am, April 20, Monday)

- LIGO/Virgo: Multi-messenger observations -- Laura Cadonati (Univ. of Virginia)
- GAIA observations -- Amina Helmi (Univ. of Amsterdam)
- NICER News -- Zaven Arzoumanian (NASA)

Plenary III: Frontiers of Discovery: Flavor, Color and Exoplanets (8:30am, April 21, Tuesday)

- Exoplanets -- Didier Queloz (Univ. of Geneva)
- "Who ordered That?" Fermilab muon physics program -- Chris Polly (FNAL)
- 20 years of RHIC and Beyond -- Larry McLerran (Univ. of Washington-Seattle)

Public Lecture Saturday night 7 pm: Event Horizon Telescope -- *Shep Doeleman*

DAP-sponsored Invited Sessions (Glennys Farrar, DAP Program Chair)

Our Neighboring Supermassive Black Holes [co-sponsored with DGRAV]

- Imaging Supermassive Black Holes with the Event Horizon Telescope: Current Results and Future Prospects -- *Michael Johnson*
- Towards Understanding Black Hole Accretion and Jet Launching: Linking Simulations to EHT Images -- *Andrew Chael*
- New results from GRAVITY -- *Reinhard Genzel*

New Results from LIGO (Katerina Chatziioannou, Chair) **[co-sponsored with DGRAV]**

- Compact Binaries in Advanced LIGO's Third Observing Run -- *Chad Hanna*
- Astrophysical Lessons from LIGO/Virgo's Black Holes -- *Maya Fishbach*
- Some Highlights from LIGO and Virgo's Third Observing Run -- *Maximiliano Isi*

Cecilia Payne-Gaposchkin Thesis Prize (Iganacio Taboada, Chair)

- Searching for Dark Matter in Distant Galaxies -- *Nicholas Rodd*
- Uncovering the Physics of Active Galactic Nuclei Feedback with High Resolution X-Ray Spectroscopy -- *Anna Ogorzalek*
- Understanding the Large-Angle CMB and Blinding DES Combined-Probe Analyses: Towards Precision Cosmology on the Largest Observable Scales -- *Jessica Muir*

AMO Frontiers in Astrophysics (Joe Britton, chair) **[co-sponsored with DAMOP]**

- Atomic Gravitational Wave Detectors -- *Jason Hogan*
- Probing Dark Matter in the Milky Way with Direct Measurements of Stellar Accelerations -- *Dan Phillips*
- Astro-combs enabled exoplanet searches - *Scott Diddams*

Aspects of Multimessenger Astrophysics (Robert Garisto, chair) **[co-sponsored with Phys. Rev.]**

- Gravitational-Wave Multimessenger Astrophysics -- *Tyson Littenberg*
- Neutrino Multimessenger Astrophysics -- *Naoko Kurahashi Neilson*
- Electromagnetic Multimessenger Astrophysics -- *Wen-Fai Fong*

From the Sun to the Highest Energies in the Universe (Tom Gaisser, chair)

- The Parker Solar Probe and its remarkable findings -- *Justin Kasper*
- Ultrahigh Energy Cosmic Rays -- *Michael Unger*
- Progress in Simulating Particle Acceleration: Different Flavors of Fermi Mechanism -- *Damiano Caprioli*

Neutrino Astrophysics (Kate Scholberg, chair) **[co-sponsored with DPF]**

- Recent Results in High-Energy Neutrino Astrophysics -- *Ignacio Taboada*
- Recent Results From Supernova Neutrino Theory -- *Irene Tamborra*
- Late Neutrinos of SN1987a -- *Kfir Blum*

Fast Radio Bursts and Tidal Disruption Events (Yuri Levin, chair)

- Fast Radio Bursts and hi-z Cosmology with CHIME -- *Kiyoshi Matsui*
- Theory of Fast Radio Bursts -- *Andrei Beloborodov*
- The Burgeoning Role of Tidal Disruption Events as Tools for Black Hole Astrophysics -- *Sjoert Van Velzen*

CANCELLED: Decadal Survey and Snowmass Process (Josh Frieman, Chair)

Fiona Harrison, Marcelle Soares-Santos, and others; Josh Frieman to lead roundtable

New Approaches to H_0 (Glennys Farrar, chair) **[co-sponsored with DGRAV]**

- Local Distance Ladder Measurements and Determination of the Hubble Constant -- *Wendy Freedman*
- An Independent Measurement of H_0 from Lensed Quasars -- *Kenneth Wong*
- CMB measurements of H_0 and new results from ACT+WMAP -- *Suzanne Staggs*

DAP Award Session **POSTPONED TO 2021 MEETING**

- **Bethe Prize Talk:** Ultraluminous X-ray Sources: Extremes of Accretion and the Search for Intermediate Mass Black Holes -- *Fiona Harrison*
- **Maria Goeppart-Mayer Award Presentation:** Cosmology with Large Galaxy Surveys -- *Elisabeth Krause*
- **Lillienfeld Prize talk:** Why Galaxies Start Pickle-Shaped: An Historical Introduction to Dark Matter and Galaxy Formation -- *Joel Primack*

Nuclear Physics with Gravitational Wave Observations (Sanjay Reddy, chair) **[co-sponsored with DGRAV & DNP]**

- Neutron Star Mergers as Sites of Heavy Element Synthesis -- *Brian Metzger*
- Compact object mergers and implications for nuclear physics — *Andreas Bauswein*
- Inferring the equation of state of dense nuclear matter using multimessenger observations of neutron stars — *Collin Capano*

Axion Cosmology and Astrophysics (Mina Arvanitaki, chair)

- Intensity Mapping: a New Tool for Dark Matter (and more) -- *Anthony Pullen*
- Toward reliable calculation of DM relic abundance for QCD axions -*Giovanni Villadoro*
- Searching for Ultralight Axions with Gravitational Waves -- *Masha Baryakhtar*

Indirect Constraints on Dark Matter (Jodi Cooley, chair) **[co-sponsored with DPF]**

- Classic Approaches to Indirect Detection -- *Tracy Slatyer*
- X-ray Searches for Axions from Nearby Isolated Neutron Stars -- *Ben Safdi*
- Searching for Dark Matter Interactions in Cosmology -- *Kim Boddy*

DAP-sponsored mini-symposia:

Advances in Spectroscopic Cosmology (Paul Martini, chair)

30 minute talk by Kyle Dawson; ***shorter talks via abstract submission*** (A22).

The Cosmic Microwave Background and Fundamental Physics on the Cosmic Frontier (Kevin Huffenberger, chair)

30 minute talk by Rafael Flaugher; ***shorter talks via abstract submission*** (A22).

NASA Physics of the Cosmos (PCOS) Sessions

There will be four NASA Physics of the Cosmos (PCOS) special splinter sessions at the April APS Meeting in Washington DC, many of which are sponsored by DAP. The purpose of the Physics of the Cosmos Program is to explore some of the most fundamental questions regarding the physical forces and laws of the universe: the validity of Einstein's General Theory of Relativity and the nature of spacetime; the behavior of matter and energy in extreme environments; the cosmological parameters governing inflation and the evolution of the universe; and the nature of dark matter and dark energy.

The Physics of the Cosmos Program Analysis Group (PhysPAG) enables direct regular communication between NASA and the community, and within the community, through public meetings that give the community opportunities to provide its scientific and programmatic input. The PhysPAG has six Science Interest Groups (SIGs), each a persistent forum aimed at providing quantitative metrics and assessments to NASA in regard to future missions in their area of interest.

There will be a **Physics of the Cosmos & PhysPAG Town Hall** at this year's April APS Meeting. [Session C05; Saturday 18 April 2020, 1:30 P.M.–3:18 P.M.; Washington 6].

Additionally, three of the SIGs will hold minisymposia. Full agendas for all these PCOS sessions can be found on the PCOS webpage:

https://pcos.gsfc.nasa.gov/physpag/meetings/APS_2020/APS2020-agenda.php

Inflation Probe Science Interest Group (IP SIG), focused on future cosmic microwave background polarization missions. [Session D22; Saturday, 18 April 2020, 6:30 P.M.–8:00 P.M.; Washington 2]

Gravitational Wave Science Analysis Group (GW SIG), focused on future gravitational-wave missions. [Session G05; Sunday 19 April 2020, 8:30 A.M.–10:18 A.M.; Washington 6]

X-Ray Science Interest Group (XR SIG), focused on future X-ray astrophysics missions. [Session M01; Sunday, 19 April 2020, 6:30 P.M.–8:00 P.M.; Roosevelt 4]

CANCELLED: Gamma-Ray Science Interest Group (GR SIG), focused on future gamma-ray astrophysics missions.