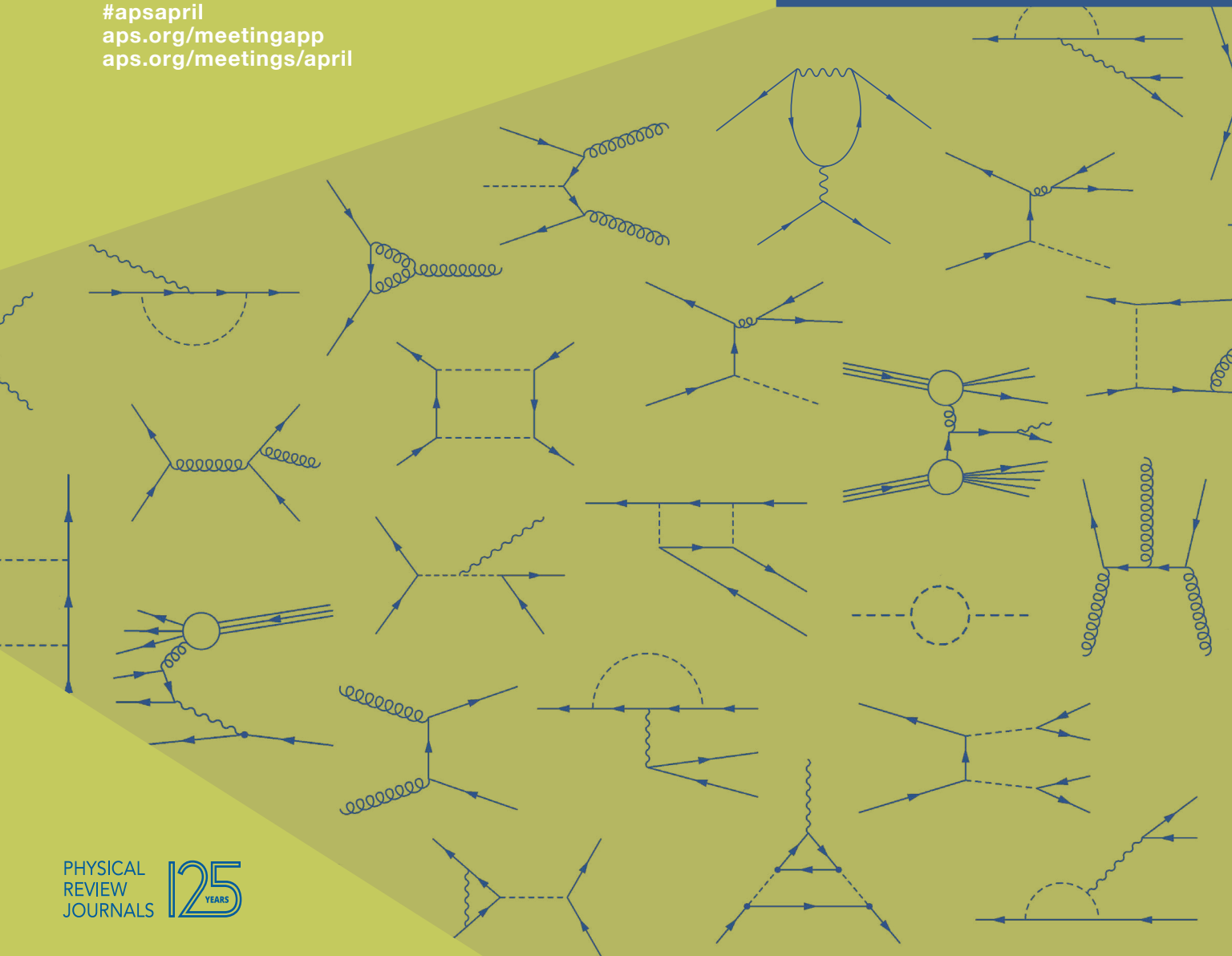


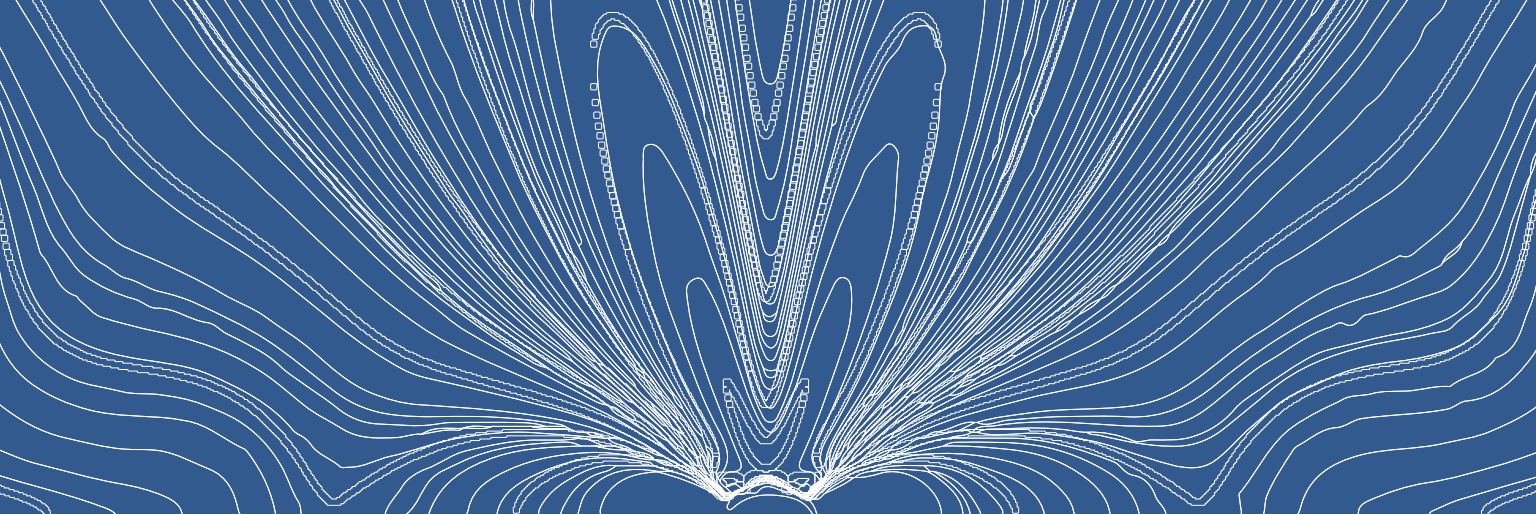
quarks 2018 cosmos

April 14-17, 2018
Columbus, Ohio

PROGRAM GUIDE

#apsapril
aps.org/meetingapp
aps.org/meetings/april





Publish Your High Energy Physics Research in the *Physical Review* Journals

APS supports the high-energy physics (HEP) community by providing authors a free and convenient route to publish HEP* research open access under the APS-SCOAP³ partnership.

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- *Physical Review Letters*
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journals.aps.org



*HEP papers covered by SCOAP³ are all those posted on arXiv.org prior to publication in any of the primary 'hep' categories: hep-ex, hep-lat, hep-ph, hep-th, and irrespective of the authors' institution or country affiliation.

WELCOME

It is a pleasure to welcome you to Columbus, and to the APS April Meeting 2018. The April Meeting is a wonderful gathering of enthusiastic scientists from diverse organizations and backgrounds who have broad interests in physics. Our meeting provides us with an opportunity to present exciting new work as well as to learn from others, and to meet up with colleagues and make new friends. While you are here, I encourage you to take every opportunity to experience the amazing science that envelops us at the meeting, and to enjoy the many additional professional and social gatherings offered.



Additionally, this is a year for Strategic Planning for APS, when the membership will consider the evolving mission of APS and where we want to go as a society. We are planning a Town Hall Meeting this Monday at 3:30 p.m., where you are invited to both hear about the processes for gathering input for, and to give your input to, a new Strategic Plan. Please attend and contribute.

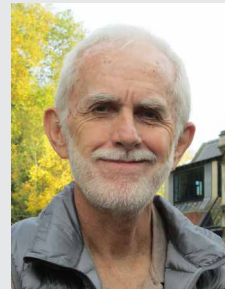
On behalf of APS, I hope you have an exciting, productive, and fulfilling week!

Roger Falcone

*2018 APS President
University of California, Berkeley*

The APS April Meeting 2018 promises to be one of the largest and most exciting of recent years.

We have a lineup of excellent and timely plenary sessions, including the Kavli Foundation Keynote Plenary Session devoted to the legacy of Richard Feynman on the centenary of his birth, and a “prize plenary” that includes our APS Medal winner, Eugene Parker, and two of our gravity-wave Nobel Laureates. A third plenary will be neutron-rich, with a talk on science policy and nuclear security, one on a neutron star in a triple system, and a talk on the recently observed binary neutron star merger.



There will be sessions on the latest LHC results, the “crisis” in cosmology, and women pioneers in astronomy, among many, many others. Rainer Weiss will give a public lecture on Saturday evening on “Exploring the Universe with Gravitational Waves.” You will definitely need the APS meeting app to navigate your way around the many interesting sessions.

I wish you a very warm welcome to Columbus!

Clifford Will

*APS April Meeting 2018 Program Chair
University of Florida*

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* *Voting Members of the APS Board of Directors*

CODE OF CONDUCT

It is the policy of the American Physical Society (APS) that all participants, including attendees, vendors, APS staff, volunteers, and all other stakeholders at APS meetings will conduct themselves in a professional manner that is welcoming to all participants and free from any form of discrimination, harassment, or retaliation. Participants will treat each other with respect and consideration to create a collegial, inclusive, and professional environment at APS Meetings. Creating a supportive environment to enable scientific discourse at APS meetings is the responsibility of all participants.

Participants will avoid any inappropriate actions or statements based on individual characteristics such as age, race, ethnicity, sexual orientation, gender identity, gender expression, marital status, nationality, political affiliation, ability status, educational background, or any other characteristic protected by law. Disruptive or harassing behavior of any kind will not be tolerated. Harassment includes but is not limited to inappropriate or intimidating behavior and language, unwelcome jokes or comments, unwanted touching or attention, offensive images, photography without permission, and stalking.

Violations of this code of conduct policy should be reported to meeting organizers, APS staff, or the APS Director of Meetings. Sanctions may range from verbal warning, to ejection from the meeting without refund, to notifying appropriate authorities. Retaliation for complaints of inappropriate conduct will not be tolerated. If a participant observes inappropriate comments or actions and personal intervention seems appropriate and safe, they should be considerate of all parties before intervening.

Code of Conduct Hotline (open during registration hours): **(301) 209-3675**

PROGRAM COMMITTEE

The APS Leadership and Meetings Department staff extend our sincere thanks to the unit program chairs and abstract sorters who, during the past year, gave so generously of their time and expertise in sorting abstracts and organizing the program for the April Meeting 2018.

April Meeting 2018 Program Committee

Chair: Clifford M. Will, University of Florida
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COM: Jesus Pando, DePaul University
Carol Scarlett, Florida A&M University
CSWP: Pearl Sandick, University of Utah
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GPMFC: Kurt Gibble, Penn State



PIPELINE

The APS PIPELINE program seeks to give students what they need to succeed as scientists and innovators in the 21st century. Learn more and get involved. Click over to our website for more information.

aps.org/programs/education/innovation



THE  KAVLI FOUNDATION

Kavli Foundation Keynote Plenary Session

A Feynman Century

Saturday, April 14

8:30 AM–10:18 AM

Convention Center, Union Station Ballroom BC



Being Feynman's Curious Sister

Joan Feynman

Jet Propulsion Lab



**Quantum Computing and Feynman's
Opportunity**

Christopher Monroe

University of Maryland



**Feynman's Footprints: Quantum Field
Theory in Nuclear and Particle Physics**

Roxanne Springer

Duke University

3

THINGS TO KNOW

1 Code of Conduct

Creating a supportive environment to enable scientific discourse at APS Meetings is the responsibility of all participants. Read the entire Code of Conduct and learn how to report an incident on page 3.

2 Free Wi-Fi in the Convention Center

APS sponsors free wi-fi service in designated “hot spots”. Wi-fi service is not available in meeting rooms.

Network: APS April Meeting

Password: apsapril

3 Official Hashtag

The official hashtag for the April meeting is #apsapril.

Join the conversation on Twitter!

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APS Meetings Staff

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Vinaya Sathyasheelappa, Meetings Manager
Ebony Adams, Meetings Planner

Eric Barth, Scientific Programs Coordinator
Donna Greene, Meetings Publications Specialist
Don Wise, Senior Meetings Registrar

MEETING SERVICES

Wi-Fi

APS sponsors free wi-fi service in designated “hot spots”. Wi-fi service is not available in meeting rooms.

Network: APS April Meeting
Password: apsapril

Registration

CONVENTION CENTER,
UNION STATION BALLROOM FOYER

Friday • 2:00–7:00 PM
Saturday • 7:30 AM–5:00 PM
Sunday • 7:30 AM–4:00 PM
Monday • 8:00 AM–3:00 PM
Tuesday • 8:00 AM–12:00 PM

Information Desk

CONVENTION CENTER,
UNION STATION BALLROOM FOYER

Feel free to stop by to ask general questions about the meeting facilities or activities. You can also inquire about last minute program changes.

Saturday–Monday • 8:00 AM–4:00 PM
Tuesday • 8:00 AM–12:00 PM

Speaker Ready Room

CONVENTION CENTER, A212

If you do not submit your presentation before the meeting, you should bring it to the Speaker Ready Room to ensure your presentation is uploaded properly. The Speaker Ready Room is equipped with the same hardware and software as those in the presentation rooms. You should submit final presentations no later than four hours before your presentation time.

Friday • 3:00–7:00 PM
Saturday–Monday • 7:30 AM–5:00 PM
Tuesday • 7:30 AM–1:00 PM

Program Changes Board

CONVENTION CENTER,
UNION STATION BALLROOM FOYER

Last minute program changes are displayed on the Program Changes Board. If you’re chairing a session, please stop by to check if there are any late changes to your session. You can also email changes to abs-help@aps.org.

Food Service

VARIOUS LOCATIONS

Concession stands are available throughout the convention center.

Press Room

CONVENTION CENTER, A214

Saturday–Monday • 8:00 AM–5:00 PM
Tuesday • 8:00 AM–12:00 PM

Press Conference Room

CONVENTION CENTER, A215

Check the press room for a schedule of press conferences.

Certificates of Attendance

If you need a certificate of attendance, please stop by the registration desk to receive it. You must do this before 12:00 PM on Tuesday, April 17. Certificates of attendance will not be issued after the meeting ends.

APS BOOTHS

Meet APS staff, learn about the latest APS activities and services, shop the store, and get fun giveaways.

CONVENTION CENTER,
UNION STATION BALLROOM FOYER

Saturday–Monday • 8:00 AM–5:00 PM
Tuesday • 8:00 AM–12:00 PM

APS Membership Booth

Ask APS staff questions about membership, journal subscriptions, and other services.

APS Souvenir Store

Don't go home empty handed! Browse t-shirts, bumper stickers, and more for great gifts to take back to your students and colleagues who were unable to attend the meeting. Pick out something fun for yourself, too!

Physical Review Journals Booth

Editors of the *Physical Review* journals and other APS staff members will be on hand at the *Physical Review* Journals Booth to answer questions on all matters pertaining to the *Physical Review* journals.

APS Programs

APS develops and implements a range of programs that improve physics education, impact policy makers, increase diversity, inform the public, and reach out to physicists around the world. Visit with APS staff to learn more about these programs:

- Education
- Diversity
- Public Outreach
- Development
- Government Affairs

Contact Congress

DON'T TAKE YOUR GRANT FOR GRANTED

Make your voice heard in Washington and help influence the funding levels for basic research by sending a letter to your Congressional delegation. APS staff will follow up each letter with a call or visit to congressional staff. If you live in the United States, you are qualified to write to your members of Congress.



Souvenir Store

Want something to take home? Come browse our t-shirts, bumper stickers, mugs, and more! We are open Monday through Friday in the APS Village!



SHOP PHYSICS!

Internet Access

APS sponsors free wireless in the designated “hot spots.”

Network: APS April Meeting

Password: apsapril

Social Media

Keep up with the action, connect with meeting attendees, and join the conversation on Twitter.

Follow [@APSM Meetings](#) and [#apsapril](#)

Business Center

A business center is located on the Main Concourse near Exhibit Hall A. Hours vary.

American Physical Society

Conferences for Undergraduate Women in Physics

APS CUWiP is a three-day regional conference where undergraduate women can experience a professional conference, learn more about graduate school and professions in physics, and meet other women in physics to share experiences, advice, and ideas. Financial assistance is available.

Applications open September 3 to October 12, 2018
aps.org/cuwip

Regional Sites

University of Massachusetts, Amherst
The College of New Jersey
College of William & Mary
The University of Alabama, Tuscaloosa
Utah State University
University of California, Santa Barbara
Texas A&M University-Corpus Christi
University of Washington, Seattle
University of California, Davis
Michigan State University
Northwestern University



MOBILE APP

The mobile app is the best way to stay connected during the meeting. Use the mobile app to:

- Browse, search, and schedule sessions from the program
- Search the complete author listing
- View sessions by unit
- Explore highlighted events
- Discover events in “Happening Now”
- Follow the meeting conversation on Twitter
- Learn about exhibitors
- Receive notifications on meeting news and events

Meetings@APS

The Meetings@APS mobile app allows attendees to view meeting information on any iOS or Android mobile device. If you have previously downloaded an APS Meetings app, please check to make sure the app is “Meetings@APS” by Bravura Technologies.

Once you have downloaded the app, start the app and select the appropriate meeting from the events list. Once selected, the Meetings@APS app will download the meeting data onto your mobile device.

Schedule

The APS Meeting app can also import your saved schedule from the online meeting bulletin. If you created a schedule on the online meeting bulletin, login to the mobile app using your APS account username and password. The synchronization is two-way. So, no matter where you edit your schedule, online or in the app, it should always be up to date.

For technical support, contact support@bravuratechnologies.com.

Download: aps.org/meetingapp



SAFETY & SECURITY

Code of Conduct

Creating a supportive environment to enable scientific discourse at APS meetings is the responsibility of all participants.

Read the full code of conduct on [page 3](#).

Badge Monitoring

All attendees must register for the meeting and wear their registration badge at all times. Security personnel or staff may check badges before permitting admission to sessions. If your badge has been lost, you may receive one replacement badge free of charge at the registration desk. Additional replacements will cost \$10.00 each.

First Aid

In the event of an emergency, please alert an APS staff member and emergency services personnel will be dispatched as needed.

Lost & Found

APS REGISTRATION DESK

Lost items may be turned into the APS Registration Desk during registration hours. If you have lost an item, please go the Registration Desk to claim it.

Americans with Disabilities Act

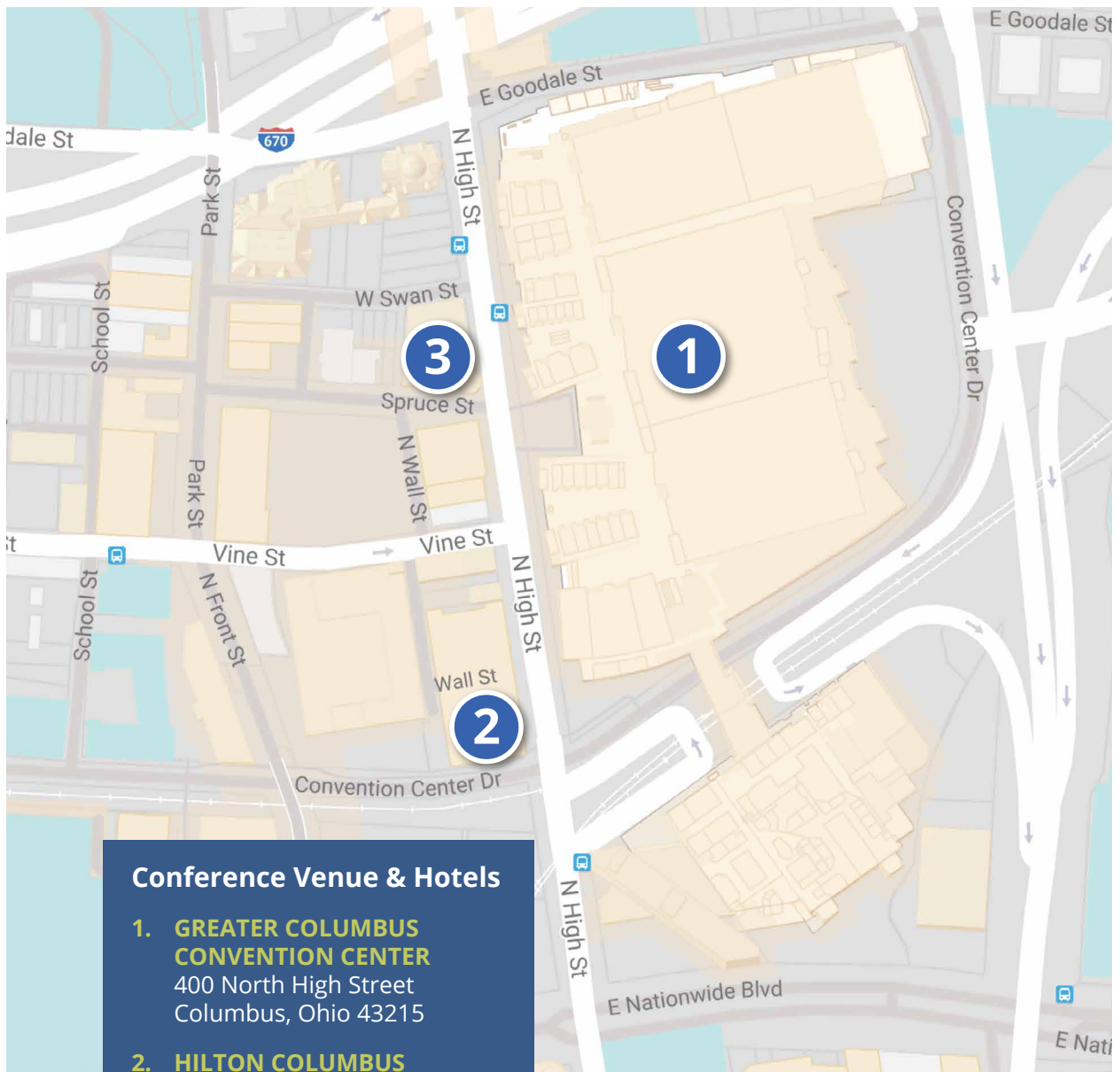
APS wishes to take any steps required to ensure that no individual with a disability is excluded, denied services, segregated, or otherwise treated differently due to the absence of auxiliary aids and services identified in the Americans with Disabilities Act.

Gender-Neutral Restrooms

Gender-neutral restrooms will be located on the first floor near room A115.



GETTING AROUND



Conference Venue & Hotels

- 1. GREATER COLUMBUS CONVENTION CENTER**
400 North High Street
Columbus, Ohio 43215
- 2. HILTON COLUMBUS DOWNTOWN**
401 North High Street
Columbus, Ohio 43215
- 3. HAMPTON INN & SUITES COLUMBUS DOWNTOWN**
501 North High Street
Columbus, Ohio 43215

SCHEDULE AT A GLANCE

FRIDAY, APRIL 13

- 8:00 AM–4:00 PM Professional Skills Development Workshop for Women
- 4:00 PM–5:00 PM APS Annual Business Meeting

SATURDAY, APRIL 14

- 8:30 AM–10:30 AM Kavli Foundation Keynote Plenary Session: A Feynman Century
- 10:45 AM–5:18 PM Scientific Sessions
- 12:00 PM–1:30 PM Lunch with the Grads
- 5:30 PM–7:30 PM Welcome Reception & Poster Session I
- 6:30 PM–7:30 PM DCOMP Business Meeting
- 7:00 PM–8:00 PM Exploring the Universe with Gravitational Waves (Public Lecture)

SUNDAY, APRIL 15

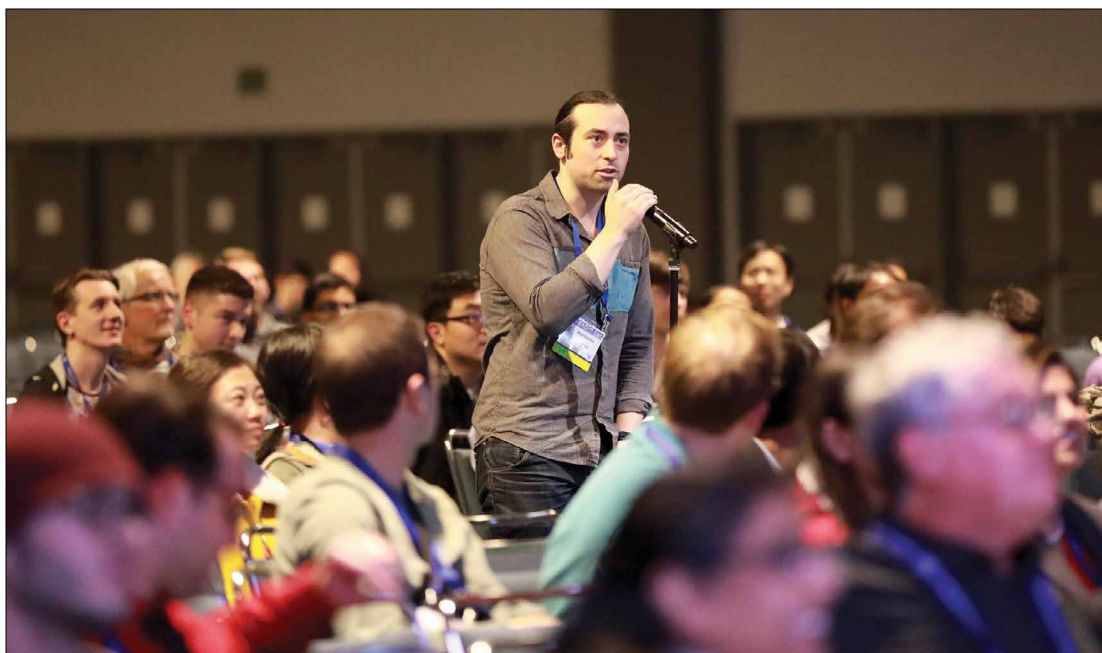
- 8:30 AM–5:18 PM Scientific Sessions
- 9:30 AM–10:30 AM FPS Business Meeting
- 10:00 AM–12:00 PM Undergraduate Breakfast, Career Workshop, and Awards
- 12:00 PM–1:30 PM Forum with Congressman/Physicist Bill Foster
- 12:00 PM–2:00 PM Preparing Students for Careers Outside Academia
- 12:33 PM–1:30 PM DPF Business Meeting
- 2:00 PM–5:00 PM Poster Session II
- 2:30 PM–3:30 PM Tutorial for Authors & Referees
- 3:30 PM–4:30 PM SPS: Affecting Change in your Undergraduate Program
- 3:30 PM–5:00 PM Meet the *Physical Review* Editors
- 4:00 PM–6:00 PM Professional Skills Seminar for Undergraduate & Graduate Women
- 5:30 PM–6:30 PM APS Prizes & Awards Ceremony
- 6:30 PM–7:00 PM NSBP/NSHP Reception
- 6:30 PM–7:30 PM Roundtable: Improving the Climate in Physics for LGBT+ Physicists
- 6:45 PM–7:45 PM GHP Business Meeting
- 7:00 PM–8:30 PM Education & Diversity Reception
- 8:00 PM–9:30 PM Reading of the Play: *Flight*

MONDAY, APRIL 16

- 8:30 AM–10:18 AM **Plenary Session II: From Nuclear Security to Neutron-star Mergers**
- 10:45 AM–5:18 PM **Scientific Sessions**
- 2:00 PM–5:00 PM **Poster Session III**
- 3:30 PM–5:00 PM **Strategic Planning Town Hall Meeting**
- 5:30 PM–6:30 PM **DNP Business Meeting**
- 5:30 PM–6:30 PM **DGRAV Business Meeting**
- 5:30 PM–6:30 PM **DAP Reception and Award Ceremony**
- 5:30 PM–6:30 PM **Town Hall on Gravitational Wave Theory and Simulations in the Era of Detections**

TUESDAY, APRIL 17

- 8:30 AM–10:18 AM **Plenary Session III: APS Medal & Nobel Prize Winners**
- 10:45 AM–3:18 PM **Scientific Sessions**



HIGHLIGHTS

FRIDAY, APRIL 13

APS Annual Business Meeting

4:00–5:00 PM CONVENTION CENTER, A216

The meeting will feature presentations from APS leadership and provide members with an opportunity to ask questions in-person and online. APS leaders will provide an overview of the Society and priorities for 2018. Attendees will have an opportunity to ask questions and share comments. The meeting will be live streamed online and recorded.

SATURDAY, APRIL 14

Kavli Foundation Keynote Plenary Session: A Feynman Century

8:30–10:18 AM CONVENTION CENTER, UNION STATION BALLROOM BC



Being Feynman's Curious Sister
Joan Feynman, Jet Propulsion Lab



Quantum Computing and Feynman's Opportunity
Christopher Monroe, University of Maryland

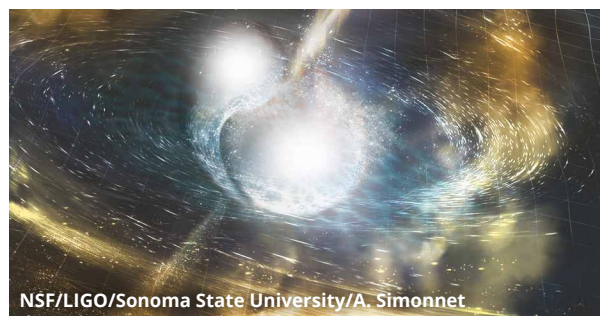


Feynman's Footprints: Quantum Field Theory in Nuclear and Particle Physics
Roxanne Springer, Duke University

Exploring the Universe with Gravitational Waves (Public Lecture)

7:00–8:00 PM CONVENTION CENTER, UNION STATION BALLROOM BC

Join 2017 Nobel Prize Winner, Rainer Weiss, for an illuminating lecture that will explore the basic concepts of gravitational waves, the instruments and methods used for data analysis, and recent results in the field. Although it's impossible to predict the full, long-term impact of the new observatories, you will leave with a vision for the future of gravitational wave astrophysics and astronomy.



SUNDAY, APRIL 15

APS Prizes & Awards Ceremony

5:30–6:30 PM CONVENTION CENTER, A120-122

APS Prizes and Awards are presented for outstanding contributions to physics. All are welcome to join us in honoring these remarkable physicists.

Forum with Congressman/Physicist Bill Foster

12:00–1:30 PM UNION STATION BALLROOM BC

An informal session with the only Physicist in Congress, Representative Bill Foster (D-IL). Pick up a sandwich or takeout from one of the food outlets and discuss the status, outlook and budget for science within the federal government with a Beltway insider.

Reading of the Play: *Flight*

8:00–9:30 PM HILTON COLUMBUS,
GEORGE BELLOWS EF

In the play *Flight*, the playwright doesn't claim it happened exactly this way; he has just taken five real-life characters and some basic biographical facts and supposed what it was like for the airplane pioneers Orville and Wilbur growing up in the dysfunctional Wright family. The play explores the lives of the Wright family in warm and comic theatrical terms.

The playwright, Arthur Giron, is the co-playwright of the recent 2015 Broadway Musical, *Amazing Grace*. The staged reading is performed by the Available Light Theatre Company of Columbus, Ohio. The play director, some of the actors, as well as a technology-historian, will be available for a discussion after the play reading. Produced by Brian Schwartz, CUNY and Smitha Vishveshwara, University of Illinois. Sponsored by: The Forum on the History of Physics and The Forum on Outreach and Engaging the Public.

MONDAY, APRIL 16

Plenary Session II: From Nuclear Security to Neutron-star Mergers

8:30–10:18 AM CONVENTION CENTER, UNION
STATION BALLROOM BC



Physics and the Government:
Navigating Science Policy and Nuclear
Security

Njema Frazier, NNSA, U.S. Dept. of
Energy



Testing General Relativity Using a
Pulsar in a Triple System

Anne Archibald, Netherlands Institute
for Radio Astronomy



Discovery, Characterization
and Physics Implications of the
electromagnetic signatures of
GW170817

Marcelle Soares-Santos, Brandeis
University

Strategic Planning Town Hall Meeting

3:30–5:00 PM CONVENTION CENTER, B130

The APS leadership is undertaking a new Strategic Planning initiative this year. Meet with APS President Roger Falcone and CEO Kate Kirby to learn about the initiative and more importantly, have the opportunity to provide your input and thoughts about the future direction of APS.

TUESDAY, APRIL 17

Plenary Session III: APS Medal & Nobel Prize Winners

8:30–10:00 AM CONVENTION CENTER, UNION
STATION BALLROOM BC



APS Medal for Excellence in Physics
Talk: Magnetic dissipation and field-
line topology

Eugene Parker, University of Chicago



LIGO and Gravitational Waves I

Rainer Weiss, Massachusetts Institute
of Technology



LIGO and Gravitational Waves II

Barry Barish, California Institute of
Technology

PRIZES & AWARDS

SUNDAY, APRIL 15

Prizes & Awards Ceremony

5:30–6:30 PM CONVENTION CENTER

APS Prizes and Awards are presented for outstanding contributions to physics. All are welcome to join us in honoring these remarkable physicists.

APS Medal for Excellence in Physics



SESSION W01

Eugene N. Parker
University of Chicago

In recognition of many fundamental contributions to space physics, plasma physics, solar physics and astrophysics for over 60 years.

Hans A. Bethe Prize



SESSION K07

Keith Alison Olive
University of Minnesota

For outstanding contributions across a broad spectrum of fields including nuclear physics, particle physics, theoretical and observational astrophysics, and cosmology, especially Big Bang nucleosynthesis and the properties of dark matter.

Tom W. Bonner Prize in Nuclear Physics



SESSION U05

Bradley M. Sherrill
National Superconducting Cyclotron Laboratory

For his scientific leadership in the development and utilization of instruments and techniques for discovery and exploration of exotic nuclei, and for his community leadership in elucidating the physics of rare isotope beams and advancing the realization of the Facility for Rare Isotope Beams facility.

Herman Feshbach Prize in Theoretical Nuclear Physics



SESSION U05

Edward Shuryak
Stony Brook University

For his pioneering contributions to the understanding of strongly interacting matter under extreme conditions, and for establishing the foundations of the theory of quark-gluon plasma and its hydrodynamical behavior.

W.K.H. Panofsky Prize in Experimental Particle Physics



SESSION G02

Lawrence R. Sulak
Boston University

For novel contributions to detection techniques, including pioneering developments for massive water Cherenkov detectors that led to major advances in nucleon decay and neutrino oscillation physics.

Andrei Sakharov Prize



SESSION R07

Ravi Kuchimanchi
Association for India's Development (AID)

For his continued research in physics while simultaneously advocating for global policies that reflect science; for leading sustainable development, human rights, and social justice efforts; and for creating a vibrant international volunteer movement that learns from, works with, and empowers communities in India.



Nayereh Tohidi, California State University, Northridge, speaking on behalf of:

Narges Mohammadi
Physicist, Engineer, Human Rights Defender, Prisoner of Conscience

For her leadership in campaigning for peace, justice, and the abolition of the death penalty and for her unwavering efforts to promote the human rights and freedoms of the Iranian people, despite persecution that has forced her to suspend her scientific pursuits and endure lengthy incarceration.

J. J. Sakurai Prize



SESSION G02

Michael Dine

University of California, Santa Cruz



Ann Nelson

University of Washington

For groundbreaking explorations of physics beyond the standard model of particle physics, including their seminal joint work on dynamical super-symmetry breaking, and for their innovative contributions to a broad range of topics, including new models of electroweak symmetry breaking, baryogenesis, and solutions to the strong charge parity problem.

Prize For a Faculty Member for Research in an Undergraduate Institution



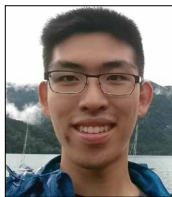
SESSION U05

Warren F. Rogers

Indiana Wesleyan University

For his essential contribution to the exploration of atomic nuclei beyond the neutron drip line and his conception and continued leadership of the Conference Experience for Undergraduates program.

LeRoy Apker Award



SESSION K07

Calvin Leung

Harvey Mudd College

For development and experimental implementation of astronomical random number generators For loophole-free tests of Bell's inequality and other applications in quantum fundamentals, astrophysics, and tests of general relativity.

Excellence in Physics Education Award



SESSION G03

The PhET Interactive Simulations Team:

Wendy K. Adams

Colorado School of Mines



Michael Dubson

University of Colorado



Emily B. Moore

University of Colorado



Ariel Paul

University of Colorado



Kathy Perkins

University of Colorado



Sam Reid

University of Colorado



Carl Wieman

Stanford University

For the systematic development, dissemination, and evaluation of the physics education tool, PhET Interactive Simulations project, used world-wide by millions of students and their teachers.

Henry Primakoff Award for Early-Career Particle Physics



SESSION B02

Eric Dahl

Northwestern University / Fermilab

For fundamental contributions to the development of new techniques for the direct detection of dark matter, including the bubble chamber and xenon time projection chamber.

J. J. and Noriko Sakurai Dissertation Award



SESSION G02

Grant Newton Remmen

California Institute of Technology

For his contributions to understanding the structure and self-consistency of gravity and effective field theories using ideas from quantum field theory and holography.

Leo Szilard Lectureship Award



SESSION J16

Edwin Stuart Lyman

Union of Concerned Scientists

For demonstrating resolve, creativity, and skill in advising national security leadership on nuclear arms control and nonproliferation agreements.

Mitsuyoshi Tanaka Dissertation Award



SESSION S02

Nathan Jurik

Syracuse University

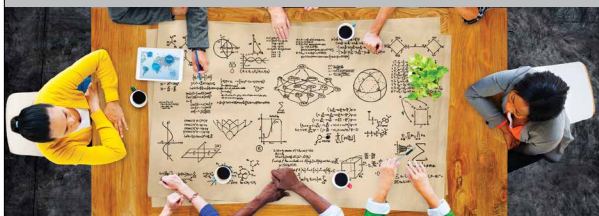
For his thesis "Observation of J/ψ p resonances consistent with pentaquark states in Λ_b to J/ψ K p decays."

APS Physics Job Center



Visit the APS Job Board today to discover or post opportunities in industry, academia, National Labs, non-profits, and more! We offer reasonable rates for job postings; job seekers may use the database for FREE!

VISIT APS PHYSICS JOB CENTER TODAY!
careers.aps.org



Strategic Planning Town Hall Meeting

Monday, April 16
3:30–5:00 PM • Convention Center, B130

The APS leadership is undertaking a new Strategic Planning initiative this year. Meet with APS President Roger Falcone and CEO Kate Kirby to learn about the initiative and more importantly, have the opportunity to provide your input and thoughts about the future direction of APS.



Physical Review Journals

Physical Review Letters

Physical Review X

Reviews of Modern Physics

Physical Review A

Physical Review B

Physical Review C

Physical Review D

Physical Review E

Physical Review Accelerators & Beams

Physical Review Applied

Physical Review Fluids

Physical Review Materials

Physical Review PER

EDITORIAL EVENTS

SUNDAY, APRIL 15

Tutorial for Authors & Referees

2:30–3:30 PM CONVENTION CENTER, A226

Editors from *Physical Review Letters* and *Physical Review* will provide information and tips for our less experienced referees and authors. This session is aimed at anyone looking to submit to or review for any of the *Physical Review* journals, as well as anyone who would like to learn more about the authoring and refereeing processes. Topics for discussion will include advice on how to write good manuscripts, similarities and differences in writing referee reports for PRL and PR, and other ways in which authors, referees, and editors can work together productively. Following a short presentation from the editors, there will be a moderated discussion.

Meet the *Physical Review* Editors Reception

3:30–5:00 PM CONVENTION CENTER, UNION STATION BALLROOM FOYER

The *Physical Review* editors invite you to their 125th anniversary celebration. The editors will be available to answer questions, hear your ideas, and discuss your comments about the journals. Light refreshments will be served.



DIVERSITY EVENTS

SUNDAY, APRIL 15

Education & Diversity Reception

7:00–8:30 PM HILTON COLUMBUS, ELIJAH PIERCE B

Join us to relax, unwind, and recognize new Fellows and award winners at the Education & Diversity Reception sponsored by the Forum on Education (FE_d), the Committee on Minorities (COM), and the Committee on the Status of Women in Physics (CSWP). We will recognize new Forum on Education Fellows, recipients of the Committee on Education's (COE) Award for Improving Undergraduate Physics Education, and women and minority physicists who have received APS prizes, awards, and fellowships. This is also a wonderful opportunity to learn about current education and diversity efforts spearheaded by COM, CSWP, COE and LGBT physicists. Light refreshments will be served. All are welcome; no registration required.



SUNDAY, APRIL 15

Professional Skills Seminar for Undergraduate and Graduate Women

4:00–6:00 PM HILTON COLUMBUS, ROBERT KING

This 2-hour seminar will focus on professional skills that students can use to negotiate a position in academia, industry or at a national lab, interact positively on teams and with a mentor or advisor, think tactically, articulate goals, enhance their personal presence, and develop alliances. This highly interactive workshop will be led by Dr. Evie Downie, Associate Professor of Physics and an Associate Dean at the George Washington University.

NSBP/NSHP Reception

**6:30–7:00 PM HILTON COLUMBUS,
EDWARD PARKER HAYDEN**

The National Society of Black Physicists (NSBP) and National Society of Hispanic Physicists (NSHP) meetup will provide opportunities for NSBP and NSHP members and those interested in the work of the societies to gather, network, and learn about NSBP and NSHP initiatives. All are welcome. Students and postdoctoral researchers are especially encouraged to attend.

Roundtable: Improving the Climate in Physics for LGBT+ Physicists

6:30–7:00 PM HILTON COLUMBUS, ELIJAH PIERCE A

The LGBT+Physicists group welcomes all interested attendees to participate in a round-table discussion on improving the professional and educational climate within physics with particular attention to those who identify as gender and sexual minorities (LGBTQQIAAP+). The session will focus on the ongoing implementation of the recommendations from the report entitled "LGBT Climate in Physics: Building an Inclusive Community," which was released at the APS March Meeting in 2015. We will discuss strategies for both APS-led and grass roots organizing aimed at improving support for physicists at different career stages and in diverse environments, including academia, industry and the public sector. Allies are especially welcome at this event to learn how they may help to support and mentor LGBT+ physicists and how the proposed actions can help improve the climate for a broad cross-section of physicists with intersecting minoritized identities within our field. Attendees are encouraged to attend the diversity reception to follow the discussion panel.

FUTURE OF PHYSICS DAYS

FUTURE OF PHYSICS DAYS

Future of Physics Days (FPD) are events just for undergraduate students. Sponsored by APS and the Society for Physics Students (SPS), FPD offers undergrads the opportunity to present their research, learn about grad school and career options, and connect with the scientific community.

SATURDAY, APRIL 14

Undergraduate Research I

10:45–11:45 AM CONVENTION CENTER, A216

Lunch with the Grads: A Panel Discussion about Grad School

12:00–1:30 PM CONVENTION CENTER, A216

Join us for lunch and ask our panel of grad students all the questions you have about what grad school is really like. Learn about choosing a graduate school, balancing the coursework and teaching, qualifying exams, and more.

Undergraduate Research II

1:30–3:06 PM CONVENTION CENTER, A216

Undergraduate Research III

3:30–5:06 PM CONVENTION CENTER, A216

SUNDAY, APRIL 15

Undergraduate Breakfast, Career Workshop and Awards

**10:00 AM–12:00 PM HILTON COLUMBUS,
EMERSON BURKHART A**

Undergraduate students can enjoy a hearty breakfast and learn about how to prepare for a wide variety of careers in physics outside of academia. Topics of this interactive workshop will include planning and self-assessment, inventorying transferable skills, finding out more about career opportunities, and successfully applying for jobs. Immediately following the workshop, top presenters from the Undergraduate Research sessions will be recognized. All presenters in the undergraduate sessions will receive certificates acknowledging their scientific accomplishments.

Preparing Students for Careers Outside the Classroom

Sponsor: APS Forum on Education

**12:00–2:00 PM HILTON COLUMBUS,
EMERSON BURKHART B**

According to recent AIP statistics, roughly half of physics Ph.D. graduates go into the private sector or government labs, and 70% of Ph.D. graduates who are in a potentially permanent position work for the private sector. However, the majority of the training and advice graduate students receive during their Ph.D. is aimed at helping them obtain academic positions, which is to be expected given that this is the typical career trajectory of the faculty members supervising graduate students. Furthermore, a promising candidate from the perspective of the private sector looks quite different from a promising candidate for academia, and thus the manner in which graduate students should emphasize their skills and experience if they desire employment in the private sector is quite different from academia. This session will bring together physicists and/or employers from outside academia who will share their insight on how graduate students can prepare themselves for a non-academic careers, as well as how departments can support graduate students for such employment.

SPS: Affecting Change in your Undergraduate Program

**3:30–4:30 PM HILTON COLUMBUS,
EMERSON BURKHART B**

Your undergraduate degree is more than just problem sets, exams, and lab reports. It's about networking, developing skills that can assist you with your career, and forming a strong community. This interactive workshop will discuss ways to strengthen SPS chapters, clubs in your department, and the department health in general. This session is devoted to ways students and faculty can affect change within their departments to make the undergraduate experience everything it needs to be. Plan for entertaining discussion, prioritizing, tool building, and networking. Both undergraduates and faculty are encouraged to attend.

UNIT SESSIONS & EVENTS

SATURDAY, APRIL 14

6:30 PM–7:30 PM **DCOMP Business Meeting**
CONVENTION CENTER, A226

SUNDAY, APRIL 15

9:30 AM–10:30 AM **FPS Business Meeting**
CONVENTION CENTER, A216

12:33 PM–1:30 PM **DPF Business Meeting**
CONVENTION CENTER, A110

6:45 PM–7:45 PM **GHP Business Meeting**
CONVENTION CENTER, A110

MONDAY, APRIL 16

5:30 PM–6:30 PM **DNP Business Meeting**
CONVENTION CENTER, A222-223

5:30 PM–6:30 PM **DGRAV Business Meeting**
CONVENTION CENTER, B131-132

5:30 PM–6:30 PM **DAP Reception & Award Ceremony**
CONVENTION CENTER, A230-231

DAP Invited

- B07** Time Domain Astrophysics
- C07** Tracing Chemical Evolution*
- D07** High Energy Particle Astrophysics*
- G07** Fireball Emission from Binary Neutron Star Mergers*
- H07** Crisis in Cosmology
- J07** R-Process Nucleosynthesis*
- K07** PRIZE TALKS Big Bang Nucleosynthesis, Dark Matter, and Astronomical Random Number Generators*
- R04** Gravitational Wave Sources: Compact Binary Formation Scenarios*
- R05** The Bold New Era of Big Data & Machine Learning*
- S07** Theory of Electromagnetic Counterparts to Gravitational Wave Events*
- U07** History of Women Pioneers in Astronomy*
- X07** Mapping the Local Universe
- Y04** Low-Frequency Gravitational Wave Astronomy*
- Y07** Lensing Probes of Dark Matter

DCOMP Invited

- G04** Beams for Physics Research*
- H06** Many Body Quantum Computations in Nuclear Physics*
- J03** History of Numerical Relativity*
- K04** Binary Merger Simulations*
- R05** The Bold New Era of Big Data & Machine Learning*

DGRAV Invited

- C04** Recent LIGO/Virgo Results
- D04** Third Generation Gravitational Wave Detectors
- G07** Fireball Emission from Binary Neutron Star Mergers*
- H04** Tests of General Relativity*
- J04** Quantum Aspects of Gravitation
- K04** Binary Merger Simulations*
- R04** Gravitational Wave Sources: Compact Binary Formation Scenarios*
- S04** Developments in Gravitational Theory
- S07** Theory of Electromagnetic Counterparts to Gravitational Wave Events*
- U02** Gravitational Waves and Dark Matter Searches*
- X04** Unveiling Massive Black Holes
- Y04** Low-Frequency Gravitational Wave Astronomy*
- Y06** The Chapel Hill Conference and its Role in the Renaissance of General Relativity*

** Jointly Sponsored Session*

DNP Invited

- B05** From Neutron Skins to Neutron Stars
- C02** Accelerators for Nuclear Physics Research: Status and Plans*
- C05** From QCD to the Deuteron*
- C07** Tracing Chemical Evolution*
- D05** Deep Learning and Quantum Computation in Nuclear Physics
- G05** High Baryon Density Physics in Nuclei and the Cosmos
- H02** Celebration of the 40th Anniversary of the Time Projection Chamber*
- H06** Many Body Quantum Computations in Nuclear Physics*
- J05** Baryon and Lepton Number Violation
- J07** R-Process Nucleosynthesis*
- K05** R-Process and Shell Evolution Near Doubly-Magic ^{78}Ni
- K07** PRIZE TALKS Big Bang Nucleosynthesis, Dark Matter, and Astronomical Random Number Generators*
- R06** The Structure of the Pion and Kaon as a Theatre of QCD*
- S05** The Axial Structure of the Nucleon and Its Implications*
- U05** DNP Prize Session
- Y05** Weakly-Bound Systems*

DPB Invited

- C02** Accelerators for Nuclear Physics Research: Status and Plans*
- G04** Beams for Physics Research*
- J02** Accelerators for Energy Frontier Research: Status and Plans*

DPF Invited

- B02** New Results and Challenges in WIMP Direct Detection
- C03** Hidden Sector Searches at the Sensitivity Frontier*
- D02** New Approaches to Direct Dark Matter Searches
- D07** High Energy Particle Astrophysics*
- G02** Sakurai and Panofsky Prize
- H02** Celebration of the 40th Anniversary of the Time Projection Chamber*
- J02** Accelerators for Energy Frontier Research: Status and Plans*
- K02** Understanding the Neutrino Sector
- R02** Frontier Physics Enabled by New Facilities
- S02** Exotic Hadrons from the LHC and B-Factories
- U02** Gravitational Waves and Dark Matter Searches*
- X02** The Energy Frontier: Results from LHC
- Y02** The High Luminosity LHC Upgrade and New Physics Windows

FECS Invited

- B04** Getting the Word Out*
- R07** Physicists and Human Rights*

FEd Invited

- D03** Research in Recruiting Physics Teachers
- G03** Excellence in Physics Education Award
- K03** The Cutting Edge of Physics Education Research*
- R03** Physics Education Research: Network Analysis, Institutional Change, and Troubleshooting in Laboratories*
- S03** Effective Practices for Program Review and Improvement: APS Task Force Preliminary Report

FHP Invited

- H03** Dark Matter & Galaxies: The Legacy of Vera Rubin*
- J03** History of Numerical Relativity*
- S06** The Legacy of Richard Feynman
- U07** History of Women Pioneers in Astronomy*
- Y06** The Chapel Hill Conference and its Role in the Renaissance of General Relativity*

FIP Invited

- B06** Opportunities in Global Nuclear Science Industries
- R07** Physicists and Human Rights*
- U03** Physics Experiments in Antarctica, What They Tell Us About the South Pole and the Changing Climate
- X06** Progress and Challenges for Women Physicists in Africa, Asia, and the Middle East

FOEP Invited

- J06** Low-Energy Precision Tests of the Standard Model*
- J17** Innovative Ideas for Engaging the Public

FPS Invited

- B04** Getting the Word Out*
- C06** Nuclear Weapons and Ballistic Missile Defense
- H03** Dark Matter & Galaxies: The Legacy of Vera Rubin*
- J16** FPS Awards Session
- R16** Current Trends in U.S. Science Policy

GFB Invited

- C05** From QCD to the Deuteron*
- Y05** Weakly-Bound Systems*

GHP Invited

- H05** Snapshots of the Dynamics of the Nucleon
- R06** The Structure of the Pion and Kaon as a Theatre of QCD*
- S05** The Axial Structure of the Nucleon and Its Implications*

GPER Invited

- K03** The Cutting Edge of Physics Education Research*
- R03** Physics Education Research: Network Analysis, Institutional Change, and Troubleshooting in Laboratories*

GPMFC Invited

- C03** Hidden Sector Searches at the Sensitivity Frontier*
- H04** Tests of General Relativity*
- J06** Low-Energy Precision Tests of the Standard Model*

INTERNATIONAL TRAVEL GRANTS AVAILABLE THROUGH APS

International Research Travel Award Program (IRTAP)

IRTAP promotes international scientific collaborations between physicists in developing and developed countries. Grant recipients receive up to \$2,000 towards international travel while visiting a collaborator for a minimum of one month.

aps.org/programs/international/programs/travel-grants.cfm

Brazil-U.S. Exchange Program - for Physicists at All Levels

Individuals at U.S. institutions can apply for funds from APS to support travel to Brazil. Ph.D. students and postdocs can pursue opportunities such as attending a summer school or working temporarily in a laboratory. Working physicists can teach a short course or give a lecture series.

aps.org/programs/international/programs/brazil.cfm

India-U.S. Travel Grant Program - for Physicists at All Levels

APS and the Indo-U.S. Science and Technology Forum provide travel support to working physicists from India and the U.S. to deliver short courses or a lecture series in physics. Postdocs and Ph.D. students can pursue opportunities in physics such as conducting research in a laboratory or attending a summer institute.

aps.org/programs/international/honors/us-india-travel.cfm

Visit the APS Office of International Affairs for information about other international opportunities and programs.



Learn more and register:
STEPUP4Women.org

IGNITE THE FUTURE OF PHYSICS!

Help us change the demographics of physics by inviting a high school physics teacher to join **STEP UP 4 Women**, a movement to close the gender gap.

Come meet us at the Education & Diversity booth.

Poster Session I: Saturday, April 14 • 5:30–7:30 PM

CONVENTION CENTER, UNION STATION BALLROOM A

General

Physics Education

Physics Education Research

Undergraduate Research

Precision Tests of Physical Laws

Poster Session II: Sunday, April 15 • 2:00–5:00 PM

CONVENTION CENTER, UNION STATION BALLROOM A

Astrophysics

Gravitation

Energy Research and Applications

Poster Session III: Monday, April 16 • 2:00–5:00 PM

CONVENTION CENTER, UNION STATION BALLROOM A

Accelerators & Storage Rings

Computational Physics

Few Body Systems

Hadronic Physics

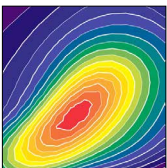
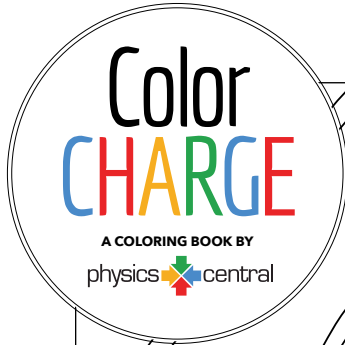
Nuclear Physics

Particles & Fields

Radiation Sources

Take a Break & Color!

Stop by the Outreach booth to pick up *Color Charge*, the new coloring book based on images from the *Physical Review* journals.



Spontaneous oscillations, signal amplification, and synchronization in a model of active hair bundle mechanics

Lijuan Han and Alexander B. Neiman, *Phys. Rev. E* **81**, 041913 (2010)

PROGRAM FORMAT

DIVISIONS

Astrophysics, Computational Physics, Nuclear Physics, Gravitational Physics, Particles & Fields, Physics of Beams

TOPICAL GROUPS

Energy Research and Applications, Few-Body Systems, Hadronic Physics, Physics Education Research, Physics of Climate, Precision Measurement & Fundamental Constants

FORUMS

Early Career Scientists, Education, Graduate Student Affairs, History of Physics, International Physics, Physics & Society, Outreach & Engaging the Public

Program Time Blocks

Contributed and invited sessions at APS general meetings are three hours in length—four sessions per day at 8:30 a.m., 10:45 a.m., 1:30 p.m. and 2:30 p.m.. The time-blocks are designated in alpha order beginning with time-block “A” on Saturday at 8:30 a.m., and ending with “Y” designating the 1:30 p.m. time-block on Tuesday.

Session Codes

The number following the alpha that designates the time-block represents the sequential numbering of the sessions within the time-block. Session A1 is one of several sessions taking place in parallel in the first time-block on Monday. The number following the decimal in the session code represents the sequence of the papers to be presented in that session. For example: B03.4 = Time-block B (Saturday at 10:45 a.m.); Session 3 (of several) within that time-block; and the 4th paper to be presented in that session.

Audio Visual (AV)

In keeping with our legally binding contract with our AV vendor, speakers are not permitted to bring their own projection equipment for use at the meeting. All presentations will be handled by our on-site presentation management system. Personal laptops may not be used for presentations. The following guide will give you an overview of how to upload your files to our system, and what to expect when you get to the meeting.

EQUIPMENT: The standard AV package consists of a laptop, LCD projector, screen, laser pointer and 2 lapel microphones—one for the chair and one for the speakers. Any additional AV equipment must be rented by the speaker directly through APS’s designated AV provider located in A210-211. The speaker is responsible for the cost of renting any additional equipment.

Presentation Management and Upload Instructions

The APS April Meeting 2018 presentation management website is now open! You may submit your PowerPoint presentation now and/or during the meeting. You should submit your presentation AT LEAST four hours before your scheduled session.

HOW TO REGISTER: Enter your username (which is your presenter email address) on the presentation management system website. You will be prompted to create a password. Once complete, you will be able to upload your presentation. Save your username and password in case you need to make changes to your presentation.

Upload Information

GUIDELINES: Please read the guidelines on the presentation management website before uploading your presentation. If you need assistance or have any questions about uploading your presentation, please email support@sessionupload.com.

CONFIRMATION: After submitting your presentation, you will receive a confirmation email within an hour. If you do not receive a confirmation, please email support@sessionupload.com to ensure your file was received. Please include APS April Meeting 2018 and your name in the email.

EDITING YOUR PRESENTATION: If you need to make changes to a presentation that you submitted, you may submit the presentation using a new filename. Be sure to delete the earlier submission.

Presentation Information

PRESENTER MODE: All PowerPoint presentations may be run in presenter mode, which allows you to view your speaker notes privately while presenting only your slides to the audience. For more information on Microsoft PowerPoint presenter mode, please visit the PowerPoint website.

Guidelines for Speakers

ORAL PRESENTATIONS: Please arrive at least 15 minutes prior to the scheduled time of your talk. Contributed papers are allocated 12 minutes each—10 minutes for presentation and 2 minutes for questions from the audience, unless otherwise specified. Invited papers are allocated 36 minutes—30 minutes for presentation and 6 minutes for questions from the audience.

Note: Occasionally (and unfortunately) the chair for a session may not appear, in which case we ask that the first presenter serve as chair of the session.

POSTER PRESENTATIONS: If you are presenting a poster, please be sure to have your poster up beginning at 10:00 a.m. on the day of your poster presentation to which you have been assigned, and taken down immediately at the end of the day. You must be on hand at the beginning of the poster session (see Epitome for times). APS will not be responsible for posters left up after the end of each poster session. No AV is allowed in the poster sessions. Posters will be on display between the hours of 10:00 a.m. to 5:00 p.m. Saturday, Sunday, and Monday.

Speaker Ready Room

CONVENTION CENTER, A212

If you do not submit your presentation before the meeting, you should bring it to the Speaker Ready Room to ensure your presentation is uploaded properly. The Speaker Ready Room is equipped with the same hardware and software as those in the presentation rooms. You should submit final presentations no later than four hours before your presentation time.

Friday • 3:00–7:00 PM

Saturday–Monday • 7:30 AM–5:00 PM

Tuesday • 7:30 AM–1:00 PM

Guidelines for Session Chairs

Before Your Session

1. **CHECK THE PROGRAM:** Determine the number and order of the abstracts to be presented, the time allocated to each abstract, and if there are any supplementary abstracts assigned to the session.
2. **CHECK THE PROGRAM CHANGES BOARD NEAR THE INFORMATION DESK:** See if any changes have been made to your session.
3. **ARRIVE EARLY:** 15 minutes prior to the start of the session, familiarize yourself with the controls for lights, microphones, AV equipment, and the timer. If you encounter problems, immediately alert the meeting staff at the registration desk or meeting information desk, and/or an AV technician.

During Your Session

1. **INTRODUCTIONS:** At the start of the session, briefly introduce yourself and explain the timing system.
2. **CHECK THE MICROPHONE:** Make sure the lavalier is no lower than 6" below the chin.
3. **START ON TIME:** Announce the first abstract and author, and start the provided timer.
4. **STICK TO THE SCHEDULE:** Many attendees move between sessions to hear specific abstracts. Adhere to the time schedule so that simultaneous sessions are synchronized as best as possible.
5. **ALLOTTED TIMES:** If your session includes both contributed and invited abstracts, be aware of the different times allocated for each and set the timer as follows:

Contributed Abstracts: set timer for eight minutes to give initial warning, then set the final bell to go off two minutes later to signal the end of the talk. Allow two additional minutes for questions.

Invited Abstracts: set timer for 25 minutes to give initial warning, then set the final bell to go off five minutes later to signal the end of the talk. Allow six additional minutes for questions.

6. **TIMING SPEAKERS:** When a speaker's time is up, ask them to stop in a courteous but firm manner. Any time used by speakers and/or technicians to set up laptops or any other equipment is deducted from the speaker's total time allotment. Start timing the speaker from the moment they come to the front, not when they begin speaking.
7. **ABSENT SPEAKERS:** Should a speaker fail to appear, call the author of the first supplementary abstract assigned to the session, if any. If that author is not in attendance, call the author of the following supplementary abstract, and so on. If there are no supplementary abstracts assigned to your session, allow the preceding discussion to continue, or recess the session until it is time for the next scheduled abstract. At the end of the session, if time allows, call again for the regularly scheduled abstract.
8. **SESSION PROBLEMS:** If any problems arise that you are unable to handle while continuing to chair the session, request an AV technician.

2018

PHYSICS DEPARTMENT CHAIRS CONFERENCE

June 7-9, 2018 ◆ College Park, MD



REGISTRATION OPEN NOW

go.aps.org/chairs2018

Saturday, April 14 8:30 AM

- A01 Kavli Foundation Keynote Plenary Session: A Feynman Century** Room: Union Station Ballroom BC **INVITED**
Sponsor: APS Chair: Roger Falcone, University of California, Berkeley Invited Speakers: Joan Feynman, Christopher Monroe, Roxanne Springer

Saturday, April 14 10:45 AM

- B02 New Results and Challenges in WIMP Direct Detection** Room: A112-113 **INVITED PRIZE/AWARD**
Sponsor: DPF Chair: Priscilla Cushman, University of Minnesota Invited Speakers: Eric Dahl, Elena Aprile, John Orrell
- B04 Getting the Word Out** Room: A120-122 **INVITED**
Sponsor: FECS FPS Chair: Maria Longobardi, University of Geneva Invited Speakers: Anna Quider, Joseph Bevitt, Jesse Silverberg
- B05 From Neutron Skins to Neutron Stars** Room: A123-125 **INVITED**
Sponsor: DNP Chair: Evangeline Downie, George Washington University Invited Speakers: Daniel Watts, Seamus Riordan, Jorge Piekarewicz
- B06 Opportunities in Global Nuclear Science Industries** Room: B130 **INVITED**
Sponsor: FIP Chair: Roy Peterson, University of Colorado Invited Speakers: Philip Cole, Nigel Stevenson, Raymond Ladbury
- B07 Time Domain Astrophysics** Room: B131-132 **INVITED**
Sponsor: DAP Chair: Keivan Stassun, Vanderbilt University Invited Speakers: Shriharsh Tendulkar, John Wisniewski, Laura Chomiuk
- B08 Machine Learning, and Other Advanced Computational Techniques** Room: A110
Sponsor: DPF DNP Chair: Matthew Graham, SLAC National Accelerator Laboratory
- B09 Supersymmetry Searches and Models** Room: A111
Sponsor: DPF Chair: Tao Han, University of Pittsburgh
- B10 Undergraduate Research I** Room: A216 **UNDERGRADUATE**
Sponsor: APS SPS Chair: Crystal Bailey, American Physical Society
- B11 Heavy Flavor and Heavy Hadron Physics** Room: A220-221
Sponsor: DNP DPF Chair: Dmitri Denisov, Fermilab
- B12 Hadronic Physics I** Room: A222-223
Sponsor: GHP DNP Chair: Ian Cloet, ANL
- B13 Alternative Theories of Gravity** Room: A224-225
Sponsor: DGRAV Chair: Leo Stein, California Institute of Technology
- B14 Computational Physics** Room: A226
Sponsor: DCOMP

B15 Physics of the Cosmos MinisymposiumRoom: B230-231 **MINI-SYMPOSIUM**

Invited Speakers: John Conklin

B16 Gravitational Waves: Data Analysis Techniques and Parameter Estimation - I Room: B232-233

Sponsor: DAP DGRAV Chair: Richard O'Shaughnessy, LIGO

B17 Galactic Sources and Cosmic-ray Accelerators

Room: B234-235

Sponsor: DAP

Saturday, April 14 12:00 PM**B20 Future of Physics Days: Lunch with the Grads**

Room: A216 Bldg: Convention Center

CAREERS UNDERGRADUATE**Saturday, April 14 1:30 PM****C02 Accelerators for Nuclear Physics Research: Status and Plans** Room: A112-113 **INVITED**

Sponsor: DPB DNP Chair: Michiko Minty, BNL Invited Speakers: Ferdinand Willeke, Yuhong Zhang, Jie Wei

C03 Hidden Sector Searches at the Sensitivity Frontier Room: A114-115 **INVITED**

Sponsor: GPMFC DPF Chair: Mike Snow, Indiana University, Bloomington Invited Speakers: Lutz Trahms, Philip Tanedo, Paolo Crivelli

C04 Recent LIGO/Virgo Results Room: A120-122 **INVITED**

Sponsor: DGRAV Chair: Laura Cadonati, Georgia Institute of Technology Invited Speakers: Jolien Creighton, Jennifer Driggers, Sinead Walsh

C05 From QCD to the Deuteron Room: A123-125 **INVITED**

Sponsor: GFB DNP Chair: William Detmold, MIT Invited Speakers: Phiala Shanahan, Victor Mokeev, Martha Constantinou

C06 Nuclear Weapons and Ballistic Missile Defense Room: B130 **INVITED**

Sponsor: FPS Chair: Joel Primack, University of California, Santa Cruz Invited Speakers: Ted Postol, Laura Grego, Roy Schwitters

C07 Tracing Chemical Evolution Room: B131-132 **INVITED**

Sponsor: DAP DNP Chair: Enrico Ramirez-Ruiz, University of California, Santa Cruz Invited Speakers: Anna Frebel, Charli Sakari, Jill Naiman

C08 Neutrino Physics: Results and New Initiatives I Room: A110

Sponsor: DPF Chair: Bipul Bhuyan, Indian Institute of Technology Guwahati

C09 Beyond Standard Model Physics I Room: A111

Sponsor: DPF Chair: Tao Han, University of Pittsburgh

C10 Undergraduate Research II Room: A216 **UNDERGRADUATE**

Chair: James Merrick, Society of Physics Students

- C11 Nuclear Theory I Room: A220-221**
Sponsor: DNP Chair: Lucas Platter, University of Tennessee
- C12 Ultrarelativistic Heavy Ions Room: A222-223**
Sponsor: DNP Chair: Justin Frantz, Ohio State University, Athens
- C13 Analytical Calculations and Approximations in General Relativity Room: A224-225**
Sponsor: DGRAV Chair: Eanna Flanagan, Cornell University
- C14 Gravitational Wave SIG Minisymposium Room: A226 MINI-SYMPOSIUM**
Invited Speakers: Peter Wass
- C15 Missions and Instruments Room: B230-231**
Sponsor: DAP Chair: Tyce DeYoung, Michigan State University
- C16 Compact Object Structure and Magnetic Fields Room: B232-233**
Sponsor: DAP DGRAV Chair: Zaven Arzoumanian, NASA
- C17 Physics Education and Outreach Room: B234-235**
Sponsor: FEEd FOEP Chair: Andrew Heckler, Ohio State University

Saturday, April 14 3:30 PM

- D02 New Approaches to Direct Dark Matter Searches Room: A112-113 INVITED**
Sponsor: DPF Chair: Paolo Crivelli, ETH Zurich Invited Speakers: Gordan Krnjaic, Iftah Galon, Matthew Pyle
- D03 Research in Recruiting Physics Teachers Room: A114-115 INVITED**
Sponsor: FED Chair: Monica Plisch, American Physical Society Invited Speakers: Michael Marder, Eleanor Close, Wendy K. Adams
- D04 Third Generation Gravitational Wave Detectors Room: A120-122 INVITED**
Sponsor: DGRAV Chair: Lisa Barsotti, MIT Invited Speakers: Matthew Evans, Salvatore Vitale, Ho Jung Paik
- D05 Deep Learning and Quantum Computation in Nuclear Physics Room: A123-125 INVITED**
Sponsor: DNP Chair: David Dean, Oak Ridge National Laboratory Invited Speakers: Thomas Papenbrock, Martin Savage, Mike Williams
- D06 Best Practices for Establishing a Diverse and Inclusive Workplace, a Panel Discussion Room: B130 INVITED**
Sponsor: COM
- D07 High Energy Particle Astrophysics Room: B131-132 INVITED**
Sponsor: DAP DPF Chair: Tracy Slatyer, MIT Invited Speakers: Stephanie Wissel, Colas Rivière, Carla Bonifazi
- D08 Neutrino Physics: Results and New Initiatives II Room: A110**
Sponsor: DPF Chair: Adam Aurisano, University of Cincinnati
- D09 Beyond Standard Model Physics II Room: A111**
Sponsor: DPF
- D10 Undergraduate Research III Room: A216 UNDERGRADUATE**
Sponsor: SPS APS Chair: Cortney Bougher, American Physical Society

- D11 Nuclear Reactions & Nuclear Structure Room: A220-221**
Chair: Robert Janssens, University of North Carolina at Chapel Hill
- D12 Hadronic Physics II Room: A222-223**
Sponsor: GHP DNP Chair: Holly Szumila-Vance, Jefferson Lab
- D13 Quantum Aspects of Gravitation - I Room: A224-225**
Sponsor: DGRAV Chair: Steven Carlip, University of California, Davis
- D14 Numerical Relativity: Black Hole Binaries Room: A226**
Sponsor: DGRAV Chair: Carlos Lousto, Rochester Institute of Technology
- D15 Indirect Dark Matter Searches Room: B230-231**
Sponsor: DAP DPF Chair: Tim Linden, Ohio State University
- D16 Optical Counterparts to Gravitational-Wave Events Room: B232-233**
Sponsor: DAP DGRAV Chair: Judith Racusin, NASA Goddard Space Flight Center Invited Speakers: Daniel Kasen
- D17 Precision Measurements of Magnetic Moments and Electric Dipole Moments Room: B234-235**
Sponsor: GPMFC Chair: Timothy Chupp, University of Michigan

Saturday, April 14 5:30 PM

- F01 Welcome Reception and Poster Session I (17:30-19:30) Room: Union Station Ballroom A POSTER UNDERGRADUATE**

Saturday, April 14 6:30 PM

- F14 DCOMP Business Meeting Room: A226 Bldg: Hilton Columbus**



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Sunday, April 15 8:30 AM

- G02 Sakurai and Panofsky Prize**
Room: A112-113 INVITED PRIZE/AWARD
 Sponsor: DPF Chair: Marcela Carena, FNAL Invited Speakers: Ann Nelson, Michael Dine, Laurence Sulak, Grant Remmen
- G03 Excellence in Physics Education Award**
Room: A114-115 INVITED PRIZE/AWARD
 Sponsor: FED Chair: Geraldine Cochran, Rutgers University Invited Speakers: Carl Wieman, Katherine Perkins, Suzanne White Brahmia, Vashti Sawtelle
- G04 Beams for Physics Research** **Room: A120-122 INVITED**
 Sponsor: DPB DCOMP Chair: Stephen Milton, Los Alamos National Laboratory Invited Speakers: Erik Hemsing, Yury Ivanyushenkov, Luca Giannessi
- G05 High Baryon Density Physics in Nuclei and the Cosmos**
Room: A123-125 INVITED
 Sponsor: DNP Chair: Ramona Vogt, Lawrence Livermore National Laboratory Invited Speakers: Jocelyn Read, Swagato Mukherjee, Frank Geurts
- G07 Fireball Emission from Binary Neutron Star Mergers**
Room: B131-132 INVITED
 Sponsor: DAP DGRAV Chair: Fiona Harrison, Caltech Invited Speakers: Eric Burns, Gregg Hallinan, Anthony Piro
- G08 Neutrino Experiments: Backgrounds, Calibration, and Instrumentation** **Room: A110**
 Sponsor: DPF Chair: Kate Scholberg, Duke University
- G09 Dark Matter Theories, Models, and Phenomenology**
Room: A111
 Sponsor: DPF DAP Chair: Matthew Graham, SLAC National Accelerator Laboratory
- G10 Historical Trends Across the Disciplines** **Room: A216**
 Sponsor: FHP Invited Speakers: Ryan Chaban
- G11 Mini-Symposium on FRIB and ReA Instrumentation I**
Room: A220-221 MINI-SYMPOSIUM
 Sponsor: DNP Chair: Benjamin Kay, Argonne National Laboratory Invited Speakers: Manoel Couder
- G12 Hadrons and Light Ions; Bayesian Methods** **Room: A222-223**
 Sponsor: DNP Chair: Roxanne Springer, Duke University
- G13 Gravitational Waves: Source Modeling - I** **Room: A224-225**
 Sponsor: DGRAV Chair: Scott Hughes, MIT
- G14 Gravitational Waves: Data Analysis Techniques and Parameter Estimation - II** **Room: A226**
 Sponsor: DGRAV Chair: Salvatore Vitale, MIT

- G15 Medium Energy Cosmic Rays** **Room: B230-231**
 Sponsor: DAP Chair: William Hanlon, The University of Utah

- G16 Neutrinoless Double Beta Decay and Neutrino Mass**
Room: B232-233
 Sponsor: DNP Chair: Vincente Guiseppe, University of South Carolina

- G17 NICER: First Results** **Room: B234-235**
 Sponsor: DAP Invited Speakers: Zaven Arzoumanian

Sunday, April 15 9:30 AM

- G01 FPS Business Meeting**
Room: Edward Parker Hayde Bldg: Hilton Columbus
 Sponsor: FPS

Sunday, April 15 10:00 AM

- G20 Undergraduate Breakfast, Career Workshop, and Awards**
Room: Emerson Burkhart A Bldg: Hilton Columbus
CAREERS UNDERGRADUATE

Sunday, April 15 10:45 AM

- H02 Celebration of the 40th Anniversary of the Time Projection Chamber** **Room: A112-113 INVITED**
 Sponsor: DPF DNP Chair: Priscilla Cushman, University of Minnesota Invited Speakers: David Nygren, Flavio Cavanna, Helen Caines
- H03 Dark Matter & Galaxies: The Legacy of Vera Rubin**
Room: A114-115 INVITED
 Sponsor: FPS FHP Chair: Beverly Hartline, Montana Tech Invited Speakers: Annika Peter, Alycia J. Weinberger, Deidre Hunter, Participation From Audience
- H04 Tests of General Relativity** **Room: A120-122 INVITED**
 Sponsor: DGRAV GPMFC Chair: Clifford Will, University of Florida - Gainesville Invited Speakers: Brian D'Urso, Manuel Rodrigues, Jason Hogan
- H05 Snapshots of the Dynamics of the Nucleon**
Room: A123-125 INVITED
 Sponsor: GHP Chair: Bob McKeown, Jefferson Lab Invited Speakers: Julie Roche, Yi-Bo Yang, Prithwish Tribedy
- H06 Many Body Quantum Computations in Nuclear Physics**
Room: B130 INVITED
 Sponsor: DCOMP DNP Chair: Alexei Bazavov, Michigan State University Invited Speakers: Sofia Quaglioni, Gustav R. Jansen, Dean Lee
- H07 Crisis in Cosmology** **Room: B131-132 INVITED**
 Sponsor: DAP Chair: Josh Frieman, Fermilab Invited Speakers: Daniel Scolnic, Stephen Feeney, Bradford Benson
- H08 Neutrino Beams I** **Room: A110**
 Sponsor: DPF Chair: Leonidas Aliaga, Fermi National Accelerator Laboratory

H09 Dark Matter Searches, Dark Forces, and Bosonic Mediators**Room: A111**

Sponsor: DPF Chair: Scott Hertel, UMass Amherst

H10 Current Research in Physics Education Room: A216

Sponsor: GPER Chair: Paula Heron, University of Washington

H11 Mini-Symposium on FRIB and ReA Instrumentation II**Room: A220-221 MINI-SYMPOSIUM**

Sponsor: DNP Chair: Steven Pain, Oak Ridge National Lab

H12 Computational Issues and Few-Nucleon Systems**Room: A222-223**

Sponsor: GFB Chair: Dean Lee, Michigan State University

H13 Quantum Aspects of Gravitation - II Room: A224-225

Sponsor: DGRAV Chair: Eugenio Bianchi, Penn State

H14 Gravitational Waves: Searches and Detected Signals**Room: A226**

Sponsor: DGRAV Chair: Peter Shawhan, University of Maryland, College Park

H15 Ultra High Energy Cosmic Rays Room: B230-231

Sponsor: DAP Chair: Alexander Moiseev, NASA

H16 Future Science and Prospects in MeV Gamma-ray Astrophysics Room: B232-233

Sponsor: DAP

H17 Electromagnetic Follow-Up of Gravitational-Wave Observations Room: B234-235

Sponsor: DAP DGRAV Chair: Enrico Ramirez-Ruiz, Lick Observatory

Sunday, April 15 12:00 PM**J20 Preparing Students for Careers Outside Academia****Room: Emerson Burkhart B Bldg: Hilton Columbus****CAREERS UNDERGRADUATE**

Sponsor: FED

J21 Forum with Congressman/Physicist Bill Foster**Room: Union Station Ballroom BC****Sunday, April 15 12:33 PM****J01 DPF Business Meeting Room: A110**

Sponsor: DPF

Sunday, April 15 1:30 PM**J02 Accelerators for Energy Frontier Research: Status and Plans Room: A112-113 INVITED**

Sponsor: DPB DPF Chair: Vladimir Shiltsev, Fermilab Invited Speakers: Daniel Schulte, Alexander Romanenko, Soren Prestemon

J03 History of Numerical Relativity Room: A114-115 INVITED

Sponsor: FHP DCOMP Chair: Daniel Kennefick, University of Arkansas-Fayetteville Invited Speakers: Larry Smarr, Ed Seidel, Joan Centrella

J04 Quantum Aspects of Gravitation Room: A120-122 INVITED

Sponsor: DGRAV Chair: Gary Horowitz, University of California Santa Barbara Invited Speakers: Wolfgang Wieland, Aron C. Wall, Mark Van Raamsdonk

J05 Baryon and Lepton Number Violation**Room: A123-125 INVITED**

Sponsor: DNP Chair: Alan Poon, Lawrence Berkeley National Lab Invited Speakers: Michael Ramsey-Musolf, J.F. Wilkerson, William Snow

J06 Low-Energy Precision Tests of the Standard Model**Room: B130 INVITED**

Sponsor: GPMFC FOEP Chair: Thomas Gentile, NIST Invited Speakers: William Cairncross, Stefan Ulmer, E. A. Hessels

J07 R-Process Nucleosynthesis Room: B131-132 INVITED

Sponsor: DAP DNP Chair: Dan Kasen, University of California Berkeley Invited Speakers: Chris Fryer, Jennifer Barnes, Gail McLaughlin

J08 Neutrino Beams II Room: A110

Sponsor: DPF Chair: Elizabeth Worcester, Brookhaven National Laboratory

J09 Liquid Xenon Dark Matter Experiments Room: A111

Sponsor: DPF Chair: Bjoern Penning, Brandeis

J10 Minisymposium: Low Radioactivity Background Techniques in Underground Experiments - I**Room: A216 MINI-SYMPOSIUM**

Sponsor: DNP Chair: Yuan Mei, LBNL Invited Speakers: Jodi Cooley

J11 Electromagnetic Production of Hadronic Resonances Room: A220-221

Sponsor: DNP Chair: Reinhard Schumacher, Carnegie Mellon University

J12 Hadronic Physics III Room: A222-223

Sponsor: GHP DNP Chair: Michael Kohl, Hampton University

J13 Numerical Relativity: Neutron Stars and Other Sources with Matter Room: A224-225

Chair: John Baker, NASA

J15 Large Scale Structure - Dark Energy Survey Room: B230-231

Sponsor: DAP DPF Chair: Michael Troxel, Ohio State University

J16 FPS Awards Session**Room: B232-233 INVITED PRIZE/AWARD**

Sponsor: FPS Chair: Beverly Hartline, Montana Tech Invited Speakers: Edwin Lyman

J17 Innovative Ideas for Engaging the Public**Room: B234-235 INVITED**

Sponsor: FOEP Chair: Larry Gladney, University of Pennsylvania Invited Speakers: Renee Horton, Lucianne Walkowicz, Becky Thompson, Sam Sampere

Sunday, April 15 2:00 PM**L01 Poster Session II (14:00-17:00)****Room: Union Ballroom A POSTER****Sunday, April 15 2:30 PM****J14 Tutorial for Authors and Referees Room: A226****Sunday, April 15 3:30 PM****K02 Understanding the Neutrino Sector****Room: A112-113 INVITED**

Sponsor: DPF Chair: Kate Scholberg, Duke University Invited Speakers: Andre de Gouvea, Diana Parno, Alexandre Sousa

- K03 The Cutting Edge of Physics Education Research**
Room: A114-115 **INVITED**
Sponsor: FED GPER Chair: Gary White, George Washington University
Invited Speakers: Jacquelyn Chini, Rachel Scherr, Angela Johnson
- K04 Binary Merger Simulations** Room: A120-122 **INVITED**
Sponsor: DGRAV DCOMP Chair: Frans Pretorius, Princeton University
Invited Speakers: Bruno Giacomazzo, Luis Lehner, Francois Foucart
- K05 R-Process and Shell Evolution Near Doubly-Magic 78Ni**
Room: A123-125 **INVITED**
Sponsor: DNP Chair: Benjamin Kay, Argonne National Laboratory
Invited Speakers: Ruben de Groot, Miguel Madurga Flores, Heiko Hergert
- K06 Creating an Inclusive Physics Community for the Next Century** Room: B130 **INVITED DIVERSITY**
Sponsor: CSWP Chair: Pearl Sandick, University of Utah
Invited Speakers: Angela Johnson, Patricia Rankin, Laura McCullough
- K07 PRIZE TALKS Big Bang Nucleosynthesis, Dark Matter, and Astronomical Random Number Generators**
Room: B131-132 **INVITED PRIZE/AWARD**
Sponsor: DAP DNP Chair: Robert Janssens, Argonne National Laboratory
Invited Speakers: Keith Olive, Gabriele Betancourt-Martinez, Shirley Li, Josiah Schwab, Calvin Leung
- K08 Neutrino Cross Sections** Room: A110
Sponsor: DPF Chair: Luke Corwin, South Dakota School of Mines and Technology
- K09 The Future of Direct Dark Matter Detection** Room: A111
Sponsor: DPF DNP Chair: Jodi Cooley, Southern Methodist University
- K10 Minisymposium on Probing High Baryon Density Physics I**
Room: A216 **MINI-SYMPOSIUM**
Sponsor: DNP Chair: Swagato Mukherjee, BNL
Invited Speakers: Fridolin Weber
- K11 Hadronic Physics IV** Room: A220-221
Sponsor: GHP DNP Chair: Or Hen, MIT
- K12 Instrumentation** Room: A222-223
Sponsor: DNP Chair: Elton Smith, Jefferson Lab
- K13 Modified Gravity, Observables and Foundations**
Room: A224-225
Sponsor: DGRAV Chair: Nicolas Yunes, Montana State University
- K14 Precision Measurements and Tests of Fundamental Physics** Room: A226
Sponsor: GPMFC Chair: V. Alan Kostelecky, Indiana University
- K15 Large Scale Structure - Theory** Room: B230-231
Sponsor: DAP Chair: Kevin Bundy, Lick Observatory
- K16 Supernovae** Room: B232-233
Sponsor: DAP
- K17 Modeling Populations of Compact Gravitational-Wave Sources** Room: B234-235
Sponsor: DAP DGRAV Chair: Carl Rodriguez, Massachusetts Institute of Technology
- K20 SPS: Affecting Change in your Undergraduate Program**
Room: Emerson Burkhart, Hilton Columbus **UNDERGRADUATE**

- K21 Meet the Physical Review Editors**
Room: Foyer Bldg: Convention Center

Sunday, April 15 4:00 PM

- K22 Professional Skills Development Seminar for Women**
Room: Robert King Bldg: Hilton Columbus **DIVERSITY**

Sunday, April 15 5:30 PM

- N01 APS Prizes and Awards Ceremonial Session**
Room: TBD **PRIZE/AWARD**
Sponsor: APS

Sunday, April 15 6:30 PM

- N20 NSBP/NSHP Reception**
Room: Edward Parker Hayde Bldg: Hilton Columbus **DIVERSITY**

- N21 Roundtable: Improving the Climate in Physics for LGBT+ Physicists** Room: Elijah Pierce B, Hilton Columbus **DIVERSITY**

Sunday, April 15 6:45 PM

- N08 GHP Business Meeting** Room: A110
Sponsor: GHP

Sunday, April 15 7:00 PM

- N22 Education and Diversity Reception**
Room: Elijah Pierce A Bldg: Hilton Columbus **DIVERSITY**

Sunday, April 15 8:00 PM

- P01 A Staged Reading of the Play: *Flight***
Room: George Bellows EF Bldg: Hilton Columbus

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Monday, April 16 8:30 AM

Q01 From Nuclear Security to Neutron-star Mergers
Room: Union Station Ballroom BC
 Sponsor: APS Chair: Enrico Ramirez-Ruiz, University of California, Santa Cruz
 Invited Speakers: Njema Frazier, Anne Archibald, Marcelle Soares-Santos

Monday, April 16 10:45 AM

R02 Frontier Physics Enabled by New Facilities
Room: A112-113 INVITED
 Sponsor: DPF Chair: Leo Pilonen, Virginia Tech
 Invited Speakers: Bertrand Echenard, Renee Fatemi, Patrizia Rossi

R03 Physics Education Research: Network Analysis, Institutional Change, and Troubleshooting in Laboratories **Room: A114-115 INVITED**
 Sponsor: GPER FED Chair: John Thompson, University of Maine
 Invited Speakers: Justyna Zwolak, Dimitri Dounas-Frazer, Charles Henderson

R04 Gravitational Wave Sources: Compact Binary Formation Scenarios **Room: A120-122 INVITED**
 Sponsor: DGRAV DAP Chair: Daniel Holz, University of Chicago
 Invited Speakers: Davide Gerosa, Will Farr, Michela Mapelli

R05 The Bold New Era of Big Data & Machine Learning
Room: A123-125 INVITED
 Sponsor: DAP DCOMP Chair: Peter Petreczky, Brookhaven National Laboratory
 Invited Speakers: Kevin Schawinski, Kai Staats, Brian Nord

R06 The Structure of the Pion and Kaon as a Theatre of QCD
Room: B130 INVITED
 Sponsor: GHP DNP Chair: Tanja Horn, Catholic University of America
 Invited Speakers: Garth Huber, Ian Cloet, Bipasha Chakraborty

R07 Physicists and Human Rights
Room: B131-132 INVITED PRIZE/AWARD
 Sponsor: FIP FECS Chair: Elena Aprile, Columbia University
 Invited Speakers: Ravi Kuchimanchi, Hamidreza Mohammadi, Shelly R. Leshner

R08 Higgs Physics **Room: A110**
 Sponsor: DPF Chair: Dmitri Denisov, Fermilab

R09 Visible Dark Photon Searches **Room: A111**
 Sponsor: DPF Chair: Gordan Krnjaic, Fermilab

R10 Minisymposium on Probing High Baryon Density Physics II
Room: A216 MINI-SYMPOSIUM
 Sponsor: DNP Chair: Chun Shen, BNL

R11 Nuclear Theory II **Room: A220-221**
 Sponsor: DNP Chair: Sofia Quaglioni, LLNL

R12 Electroweak Interactions **Room: A222-223**
 Sponsor: DNP Chair: Hans Mumm, NIST

R13 Mathematical Aspects of General Relativity
Room: A224-225
 Sponsor: DGRAV Chair: Deborah Konkowski, U.S. Naval Academy

R14 Mergers, Collapse and Black Hole Dynamics **Room: A226**
 Chair: Manuela Campanelli, Rochester Institute of Technology

R15 Cosmological Parameters and Halo Structure
Room: B230-231
 Sponsor: DAP Chair: Annika Peter, Ohio State University

R16 Current Trends in U.S. Science Policy
Room: B232-233 INVITED
 Sponsor: FPS

R17 Detection and Origin of Astrophysical Neutrinos
Room: B234-235
 Sponsor: DAP DPF Chair: John Beacom, The Ohio State University

Monday, April 16 1:30 PM

S02 Exotic Hadrons from the LHC and B-Factories
Room: A112-113 INVITED PRIZE/AWARD
 Sponsor: DPF Chair: Michael Sokoloff, University of Cincinnati
 Invited Speakers: Christoph Hanhart, Nathan Jurik, Bilas Pal

S03 Effective Practices for Program Review and Improvement: APS Task Force Preliminary Report **Room: A114-115 INVITED**
 Sponsor: FED Chair: Monica Plisch, American Physical Society
 Invited Speakers: Michael Jackson, Theodore Hodapp, Monica Plisch

S04 Developments in Gravitational Theory
Room: A120-122 INVITED
 Sponsor: DGRAV Chair: David Garfinkle, Oakland University
 Invited Speakers: Robert Wald, Chad Galley, Béatrice Bonga

S05 The Axial Structure of the Nucleon and Its Implications
Room: A123-125 INVITED
 Sponsor: GHP DNP Chair: Albert Young, North Carolina State University
 Invited Speakers: Chia Cheng Chang, Bastian Maerkisch, Richard Hill

S06 The Legacy of Richard Feynman **Room: B130 INVITED**
 Sponsor: FHP Chair: Alan Chodos, American Physical Society
 Invited Speakers: Paul Halpern, John Preskill, Virginia Trimble

S07 Theory of Electromagnetic Counterparts to Gravitational Wave Events **Room: B131-132 INVITED**
 Sponsor: DAP DGRAV Chair: Michael Coleman Miller, University of Maryland, College Park
 Invited Speakers: Davide Lazzati, Brian Metzger, Enrico Ramirez-Ruiz

S08 Detector R&D and Performance I Room: A110
Sponsor: DPF Chair: Roger Rusack, University of Minnesota

S09 Sub-GeV Dark Matter Room: A111
Sponsor: DPF Chair: Philip Schuster, SLAC National Accelerator Laboratory

S10 Minisymposium: Low Radioactivity Background Techniques in Underground Experiments - II
Room: A216 MINI-SYMPOSIUM
Sponsor: DNP Chair: Jordan Myslik, LBNL

S11 Nuclear Astrophysics Room: A220-221
Sponsor: DNP Chair: Manuel Couder, University of Notre Dame

S12 Mini-Symposium on Initial State and Early-time Dynamics of Heavy Ion Collisions I
Room: A222-223 MINI-SYMPOSIUM
Sponsor: DNP Chair: Julia Velkovska, Vanderbilt University Invited Speakers: Ronald Belmont

S13 Gravitational Waves: Source Modeling - II Room: A224-225
Chair: Harald Pfeiffer, Albert Einstein Institut Golm

S14 Gravitational Waves: Detectors and Instrumentation Room: A226
Chair: Jenne Driggers, California Institute of Technology

S15 Early Universe Room: B230-231
Sponsor: DAP Chair: Keith Olive, University of Minnesota

S16 Active Galaxies Room: B232-233
Sponsor: DAP Chair: Jeremy Perkins, NASA

S17 Neutrinos, Gamma Rays, and Cosmic Rays, oh my Room: B234-235
Sponsor: DAP DPF Chair: Amy Connolly, Ohio State University

Monday, April 16 2:00 PM

T01 Poster Session III (14:00-17:00)
Room: Union Ballroom A **POSTER**

Monday, April 16 3:30 PM

U02 Gravitational Waves and Dark Matter Searches Room: A112-113 INVITED
Sponsor: DGRAV DPF Chair: Marc Kamionkowski, Johns Hopkins University Invited Speakers: Lam Hui, Masha Baryakhtar, Ilias Cholis

U03 Physics Experiments in Antarctica, What They Tell Us About the South Pole and the Changing Climate Room: A114-115 INVITED
Sponsor: FIP Chair: Noemi Mirkin, University of Michigan - Ann Arbor Invited Speakers: Gillian Young, Dustin Schroeder, Kimberly Casey

U05 DNP Prize Session Room: A123-125 INVITED PRIZE/AWARD
Sponsor: DNP Chair: David Dean, Oak Ridge National Laboratory Invited Speakers: Warren Rogers, Edward Shuryak, Bradley Sherrill

U06 Strategic Planning Town Hall Meeting Room: B130

U07 History of Women Pioneers in Astronomy Room: B131-132 INVITED DIVERSITY
Sponsor: DAP FHP Chair: Priyamvada Natarajan, Yale University Invited Speakers: Dava Sobel, Alan Paige Lightman, Adam Riess

U08 Detector R&D and Performance II Room: A110
Sponsor: DPF Chair: Alan Schwartz, University of Cincinnati

U09 QCD and Hadrons Room: A111
Sponsor: DPF DNP Chair: Stephen Sekula, Southern Methodist University

U10 Technology and Curriculum Developments in Physics Education Room: A216
Sponsor: GPER FEd Chair: John Thompson, University of Maine

U11 Nuclear Theory III Room: A220-221
Sponsor: DNP Chair: Richard Furnstal, Ohio State University

U12 Minisymposium on Initial State and Early Time Dynamics of Heavy Ion Collisions II
Room: A222-223 MINI-SYMPOSIUM
Sponsor: DNP Chair: Frank Guerts, Rice University

U13 Gravitational Waves: Source Modeling III Room: A224-225
Chair: Jocelyn Read, Cal State Fullerton

U14 Tests of General Relativity and Gravitation Room: A226
Sponsor: DGRAV Chair: Aaron Zimmerman, CITA

U15 Cosmic Microwave Background and More Room: B230-231
Sponsor: DAP Chair: Barbara Ryden, Ohio State University

U16 Minisymposium: Low Radioactivity Background Techniques in Underground Experiments III
Room: B232-233 MINI-SYMPOSIUM
Sponsor: DNP Chair: Wenqin Xu, University of South Dakota

U17 Ultra High-energy Neutrinos Room: B234-235
Sponsor: DAP DPF Chair: Tyce DeYoung, Michigan State University

Monday, April 16 5:30 PM

V12 DNP Business Meeting Room: A222-223
Sponsor: DNP

V14 DGRAV Business Meeting Room: B131-132
Sponsor: DGRAV

V15 DAP Reception and Awards Ceremony Room: A230-231
Sponsor: DAP

Monday, April 16 6:30 PM

V20 Town Hall on Gravitational Wave Theory and Simulations in the Era of Detections Room: B131-132
Sponsor: DGRAV DAP

Tuesday, April 17 8:30 AM

W01 Tuesday Plenary: Nobel Prize and APS Medal Winners
Room: Union Station Ballroom BC INVITED PRIZE/AWARD
 Sponsor: APS Chair: Clifford Will, University of Florida - Gainesville Invited
 Speakers: Eugene Parker, Rainer Weiss, Barry Barish

Tuesday, April 17 10:45 AM

- X02 The Energy Frontier: Results from LHC**
Room: A112-113 INVITED
 Sponsor: DPF Chair: Christopher Hill, Ohio State University - Columbus
 Invited Speakers: Jessie Shelton, Swagato Banerjee, Sunil Somalwar
- X04 Unveiling Massive Black Holes** **Room: A120-122 INVITED**
 Sponsor: DGRAV Chair: Kelly Holley-Bockelmann, Vanderbilt University
 Invited Speakers: Priyamvada Natarajan, Cole Miller, Enrico Barausse
- X06 Progress and Challenges for Women Physicists in Africa, Asia, and the Middle East** **Room: B130 INVITED**
 Sponsor: FIP Chair: Cherrill Spencer, SLAC National Accelerator Laboratory
 Invited Speakers: Ibiyinka Fuwape, Rohini Godbole, Mona Mohsen
- X07 Mapping the Local Universe** **Room: B131-132 INVITED**
 Sponsor: DAP Chair: James Bullock, University of California, Irvine Invited
 Speakers: David Hogg, Coral Wheeler, Kevin Bundy
- X08 Top Physics, and Lepton Interactions** **Room: A110**
 Sponsor: DPF Chair: Douglas Schaefer, CERN
- X09 Axions I** **Room: A111**
 Sponsor: DPF
- X10 Neutrino and Nuclear Decay Rates** **Room: A216**
 Sponsor: DNP Chair: Diana Parno, Carnegie Mellon University
- X11 Computational Methods for Particle and Nuclear Physics**
Room: A220-221
 Sponsor: DCOMP
- X13 New Perspectives in Gravitational Physics I**
Room: A224-225
 Chair: Lior Burko, Georgia Gwinnett College
- X14 Gravitation and Astrophysics** **Room: A226**
 Chair: Michela Mapelli, Università di Padova
- X15 Numerical Relativity: Algorithms and Code Development**
Room: B230-231
 Sponsor: DGRAV Chair: Mark Scheel, Caltech
- X16 Cosmic Ray SIG Minisymposium**
Room: B232-233 MINI-SYMPOSIUM
 Invited Speakers: W.R. Webber, N. Lal, E.C. Stone, B.C. Heikkila, A.C. Cummings

Tuesday, April 17 1:30 PM

- Y02 The High Luminosity LHC Upgrade and New Physics Windows** **Room: A112-113 INVITED**
 Sponsor: DPF Chair: Jeremiah Mans, University of Minnesota Invited
 Speakers: Douglas Schaefer, Jessica Metcalfe, Alberto Belloni, Lindsey Gray
- Y04 Low-Frequency Gravitational Wave Astronomy**
Room: A120-122 INVITED
 Sponsor: DGRAV DAP Chair: Michele Vallisneri, Caltech Invited Speakers:
 John Baker, Stephen Taylor, Maura McLaughlin
- Y05 Weakly-Bound Systems** **Room: A123-125 INVITED**
 Sponsor: GFB DNP Chair: Kenneth Nollett, San Diego State University
 Invited Speakers: Peter Mueller, Jordy de Vries, Xilin Zhang
- Y06 The Chapel Hill Conference and its Role in the Renaissance of General Relativity** **Room: B130 INVITED**
 Sponsor: DGRAV FHP Chair: Don Salisbury, Austin College, Texas Invited
 Speakers: Peter Saulson, Dieter Brill, Dean Rickles, Joshua Goldberg
- Y07 Lensing Probes of Dark Matter** **Room: B131-132 INVITED**
 Sponsor: DAP Chair: Priyamvada Natarajan, Yale University Invited
 Speakers: Mathilde Jauzac, Yashar Hezaveh, Chihway Chang
- Y08 Electroweak Physics, and Lepton Non-Universality**
Room: A110
 Sponsor: DPF Chair: Stephen Sekula, Southern Methodist University
- Y09 Axions II** **Room: A111**
 Sponsor: DPF
- Y11 Computational Physics and Cosmos** **Room: A220-221**
 Sponsor: DCOMPO DGRAV
- Y13 New Perspectives in Gravitational Physics II**
Room: A224-225
 Sponsor: DGRAV Chair: Yosef Zlochower, Rochester Institute of Technology
- Y14 Particle Accelerators and Applied Plasma Physics**
Room: A226
 Chair: Dmitri Denisov, Fermilab
- Y15 Gamma Ray SIG Minisymposium**
Room: B230-231 MINI-SYMPOSIUM
 Invited Speakers: Sylvain Guiriec
- Y16 Inflation Probe SIG Minisymposium**
Room: B232-233 MINI-SYMPOSIUM
 Invited Speakers: Shaul Hanany

EXHIBITORS

APS Exhibit Hours

CONVENTION CENTER, FOYER

Saturday–Monday • 9:00 AM–5:00 PM

Cambridge University Press

IOP Publishing

KEYCOM Corporation

Lake Shore Cryotronics

North American Nanohertz Observatory for
Gravitational Waves (NANOGrav)

Oxford University Press

Princeton University Press

Society of Physics Students

SOFIA Science Center

W-IE-NE-R Plein & Baus Corp.

SATELLITE MEETING

HILTON COLUMBUS, EDNA BOIES HOPKINS

Sunday • 12:00–1:30 PM

Jefferson Lab Users Group

ACKNOWLEDGMENTS

The APS leadership and staff extend their sincere thanks to the abstract sorters, who, during the past year, gave so generously of their time and expertise.

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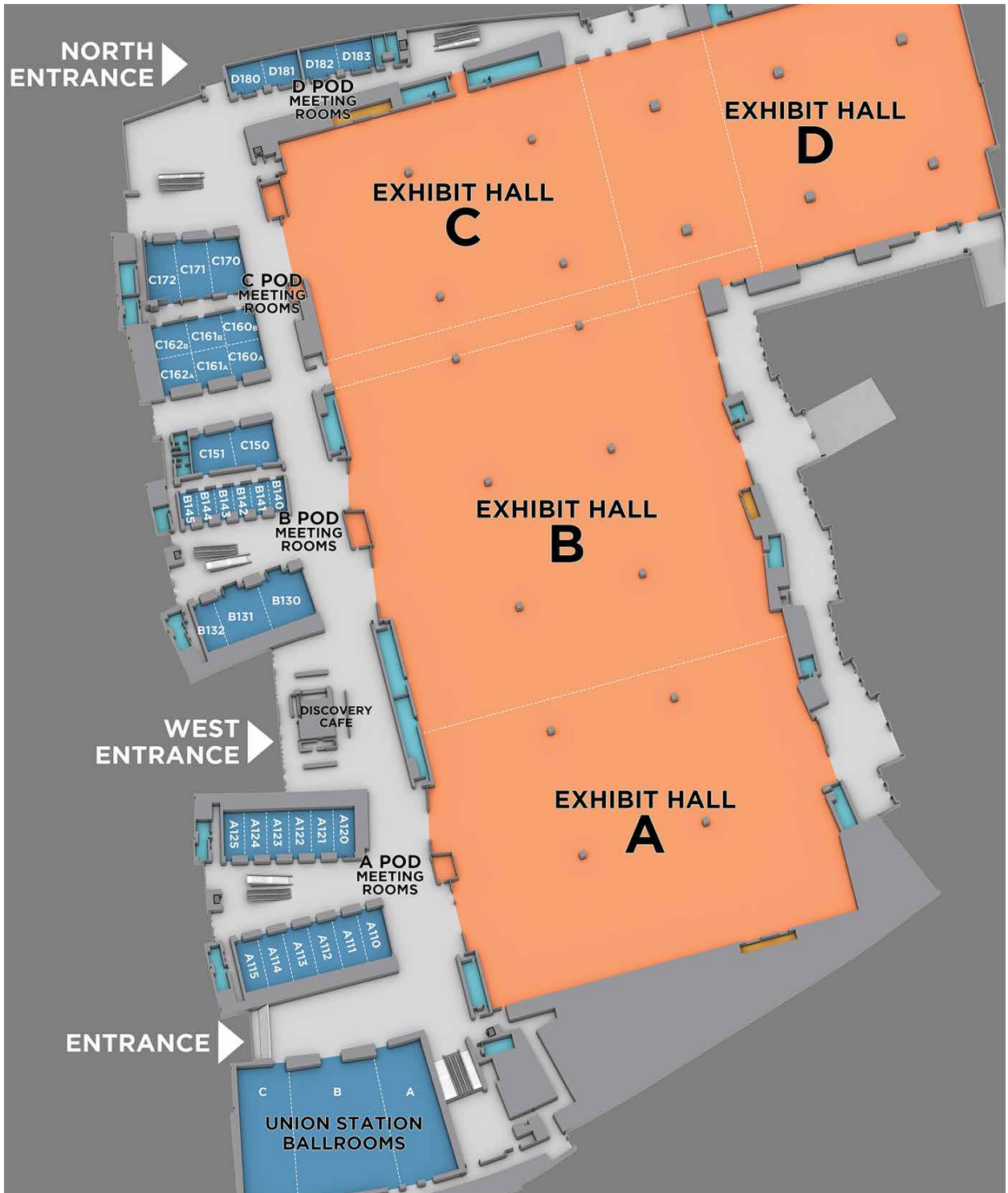
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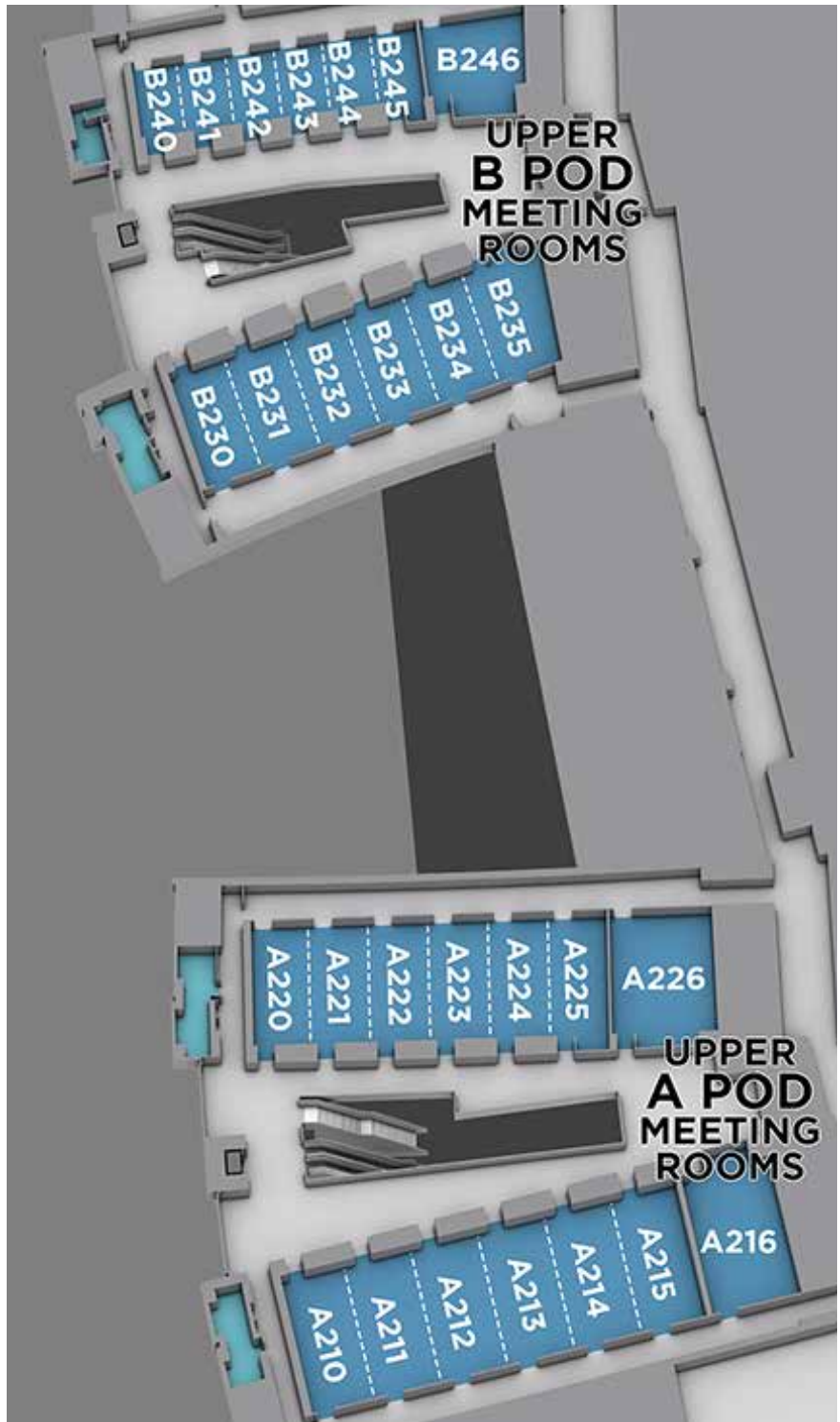
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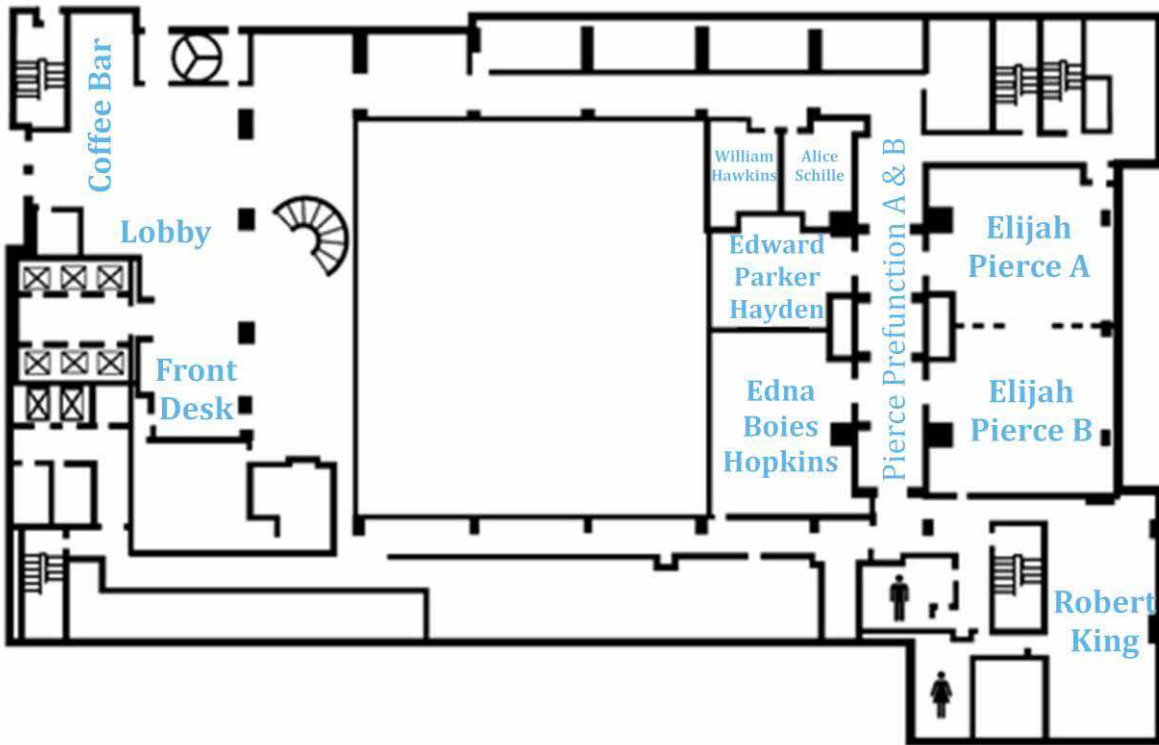
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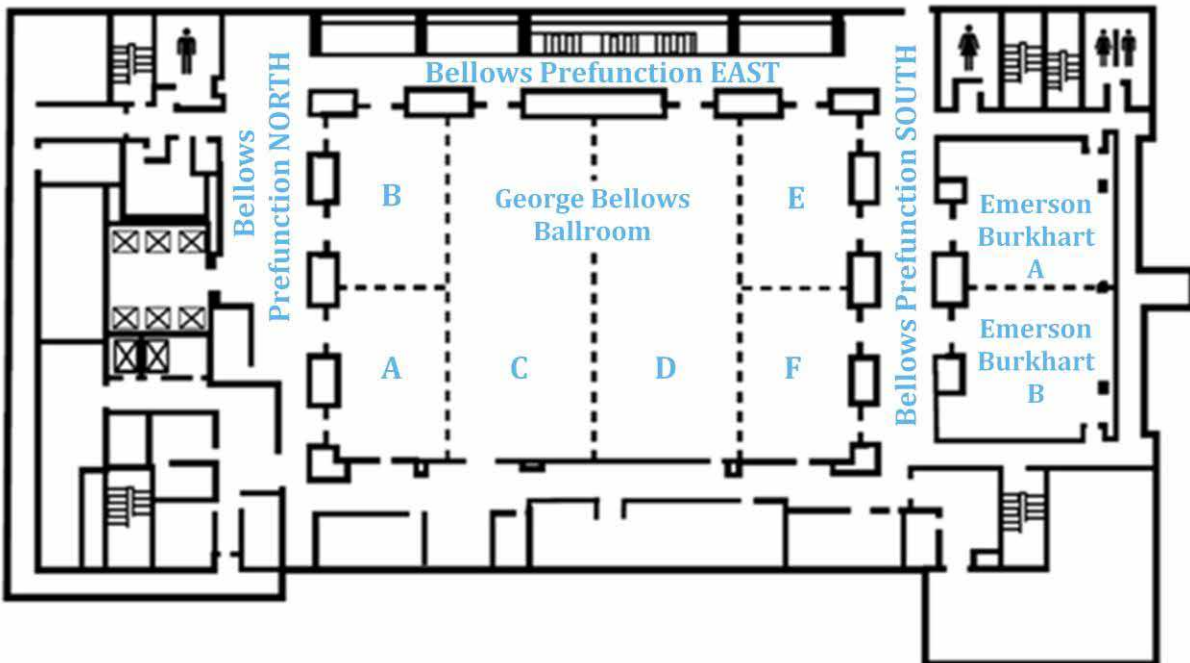


MAPS

HILTON COLUMBUS DOWNTOWN | LOBBY LEVEL



HILTON COLUMBUS DOWNTOWN | LOWER LEVEL



FUTURE APRIL MEETINGS

APS April Meeting 2019

APRIL 13-16 DENVER, CO

APS April Meeting 2020

APRIL 18-21 WASHINGTON, D.C.

APS April Meeting 2021

APRIL 17-20 SACRAMENTO, CA

APS April Meeting 2022

APRIL 16-19 WASHINGTON, D.C.

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