

Division of Particles & Fields



# Snowmass Update

Tao Han

University of Pittsburgh, HEPAP DPF Ex Officio

On behalf of Snowmass Steering Group

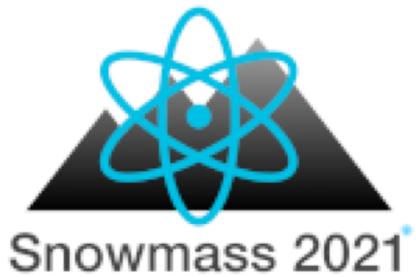
High Energy Physics Advisory Panel Meeting

March 7, 2022

- Steering group/Advisory group update
- Recent activities
- Community Summer Study meeting update



# Snowmass 2021:



## APS DPF-led community scientific study

To define the most important questions for the field of particle physics

To identify promising opportunities to address them, for the decades to come

- To achieve a broader & deeper understanding of the science in our field
  - To engage junior scientists & foster our community development
  - To reach a compelling vision for the field moving forward
- input to the “Particle Physics Project Prioritization Panel” (P5) process.

## Update on the leadership groups: Steering Group 2022

Chair: Joel Butler

Chair-elect: Sekhar Chivukula

Vice Chair: André de Gouvêa

Past Chair (2021): Tao Han

Ex Officio (2020): Young-Kee Kim

Ex Officio (2019): Prisca Cushman

DPB: Sergei Nagaitsev

DNP: Yury Kolomensky

DAP: Glennys Farrar

DGRAV: Nicolas Yunes

# Update on the leadership groups:

## Advisory Group 2022

- Steering Group
- DPF Executive Committee
  - Secretary/Treasurer: Tulika Bose
  - Councilor: Robert Bernstein
  - Member-at-Large: Heather Gray
  - Member-at-Large: Kendall Mahn
  - Member-at-Large: Mary Bishai
  - Member-at-Large: Lauren Tompkins
  - Member-at-Large: Mayly Sanchez
  - Member-at-Large: Gordon Watts
  - Early Career Member: Julia Gonski
- Editor and Communication
  - Editor – Michael Peskin
  - Communication – Robert Bernstein
  - Technical liaison – Sergei Chekanov
- Representatives from the Int. Community
  - Africa / Middle East
    - Azwinndini Muronga, Nelson Mandela Metropolitan Univ, South Africa
  - Asia / Pacific
    - Atsuko Ichikawa, Kyoto University, Japan
    - Xinchou Lou, IHEP, China
  - Canada
    - Robert McPherson, University of Victoria
  - Europe
    - Berrie Giebels, CNRS, France,
    - Michelangelo Mangano, CERN
    - One more replacement under discussion
  - Latin America
    - Claudio Dib, Universidad Tecnica Federico Santa Maria, Chile

**Many thanks to 2021 members:**  
Elizabeth Simmons, Mirjam Cvetic,  
André de Gouvêa, Natalia Toro

**Many thanks to 2021 members:**  
Val Gibson, Heather Logan

# Statement on the Invasion of Ukraine (02/28)

Dear Snowmass Participants,

Please take note of the statement from the American Physical Society at

<https://www.aps.org/about/governance/letters/ukraine.cfm>

and repeated below, which we fully support.

*The Snowmass Steering Group:*

*Joel Butler, Sekhar Chivukula, Priscilla Cushman, Andre de Gouvea, Glennys Farrar, Tao Han, Young-Kee Kim, Yury Kolomensky, Sergei Nagaitsev, Nicolas Yunes*

## **APS Condemns the Invasion of Ukraine**

The American Physical Society (APS) condemns the invasion of Ukraine and is gravely concerned about its impact. APS stands in solidarity with the Ukrainian physics community, Ukrainian scholars, and all citizens of Ukraine. As APS seeks ways to serve its members in Ukraine and Russia during this difficult time, it underscores its commitment to the principles expressed in the [APS Statement on the International Nature of Science and International Scientific Cooperation](#) and declares its support for the rights and freedoms conveyed in the [Universal Declaration of Human Rights](#) for all people. APS calls for a halt to hostilities and a peaceful end to the crisis.

# Selective Recent Activities:

- **Special Seminar series (all virtual) a.k.a. AGORAs, on topics that will shape US accelerator activities including construction projects and R&D**
  - Colliders (EF and AF)
    - Linear  $e^+e^-$ : Dec 15, 2021
    - Circular  $e^+e^-$ : Jan 19, 2022
    - Muon Colliders: Feb 16, 2022
    - Circular pp and ep: Mar 16, 2022
    - Collider discussion: week of Mar 28, at EF All-Frontier Workshop
    - Advanced Colliders: April 13, 2022
  - Muon properties and decays (RPF and AF)
    - Muon Properties and related topics I: Jan 14, 2022
    - Muon Properties and related topics II: Jan 21, 2022
    - Muon Properties and related topics III: Feb 4, 2022
  - Neutrinos (NF and AF)
    - Neutrino Colloquium I: Mar 30, 2022
    - Neutrino Colloquium II: Apr 6, 2022
    - Neutrino Colloquium III: Apr 20, 2022
    - Neutrino Colloquium IV: Apr 27, 2022
  - Accelerator Dark matter searches and other fixed target needs (RPF and AF)
    - Planned to start Apr 22, 2022
  - Possible 5<sup>th</sup> series: Accelerator Summary or Synthesis
- Ongoing Initiative of **Snowmass Early Career**
  - Colloquium series: “Big Questions in Particle Physics”

Each session is 2 hours, with at least 40 minutes reserved for questions and discussion. Ongoing discussion before and well after meeting Using google docs. SLACK. Possible white papers!

# Recent frontier-level meetings:

- **Feb. 18, Instrumentation Frontier**, changed to virtual
  - **Feb. 23 – 25, Theory Frontier**, KITP-UCSB: hybrid meeting  
Highly successful!  
~ 95 in-person participants, ~150 remote participants
  - **March 16 – 18, Neutrino Frontier**, ORNL: hybrid meeting
  - **March 28 – April 1, Energy Frontier**, Brown U: hybrid meeting
  - **May 16 – 19, RPF**, Cincinnati: hybrid meeting
  - **May 24 - 26, Community Engagement Frontier**, BNL (hybrid?)
  - **June 12, Energy Frontier/Early Career**, virtual
- Supports from funding agencies (program managers) & hosting institutions are very much appreciated!
  - Continuing supports are crucial for the success:  
Community Engagement Frontier needs support;  
Accessibility/captioning financially challenging.

# Contributed papers (white papers)

Deadline March 15, but will continue to accept submissions

- They are specific contributions to Snowmass.
- They include documents on specific scientific areas, technical articles presenting new results on relevant physics topics, and reasoned expressions of physics priorities.
- They form the basis the Snowmass write-ups and documents.

APS DPF Snowmass page

Snowmass Early Career

Snowmass Frontiers

Energy Frontier

Neutrino Physics Frontier

Rare Processes and Precision

Cosmic Frontier

Theory Frontier

Accelerator Frontier

Instrumentation Frontier

Computational Frontier

Underground Facilities

Community Engagement

Index to Submitted Papers, by Frontier

~80 WPs

- Energy Frontier (EF) (22)  Anticipated submissions
- Neutrino Physics Frontier (NF) (9)  Anticipated submissions
- Rare Processes and Precision Measurements (RF) (4)
- Cosmic Frontier (CF) (5)
- Theory Frontier (TF) (19)  Anticipated submissions
- Accelerator Science and Technology Frontier (AF) (3)
- Instrumentation Frontier (IF) (7)
- Computational Frontier (CompF) (9)
- Underground Facilities and Infrastructure (UF) (1)
- Community Engagement Frontier (CEF) (0)
-  Contributed paper submission database compiled by SEC

# Frontier Report Questions:

In preparation for the reports from the frontiers, and to aid in synthesizing a comprehensive vision for U.S. particle physics, we ask that each frontier address the following general questions in their report.

## 1. GOALS: Planning for 2025-2035 with a view toward 2050

- What are the important scientific questions in your frontier of particle physics during this period?
- What enabling tools, technologies, or facilities studied by your frontier are needed to address the pressing scientific questions in particle physics during this period?
- How can we ensure that the US particle physics community is vibrant, inclusive, diverse, and capable of addressing the scientific questions identified, and of fulfilling our obligations to society during this period?

## 2. CONTEXT:

- What can be expected from ongoing, approved, planned, or proposed scientific, technical, or community programs in addressing the issues identified by your frontier?

## 3. OPPORTUNITIES:

- What opportunities identified by your frontier are there for new scientific, technical, or community activities to create transformative change in particle physics, on what timescales could these occur, and what resources are required to realize these activities?
- What investments need to be made during 2025-2035 for the continuing scientific, technical, or community progress identified by your frontier in the decades beyond, on what timescales can these be implemented, and what resources would be required?

## 4. COLLABORATION:

- What opportunities exist for cross-frontier, cross-disciplinary, or international collaboration and cooperation in the coming decade to enhance our ability to address the issues identified (including training or mentorship)?
- How do these collaborations affect the timescales or resources needed for these activities?

# Community Summer Study (CSS)

July 17 – 26, 2022 @ UW – Seattle



## CSS Program Committee:

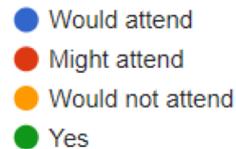
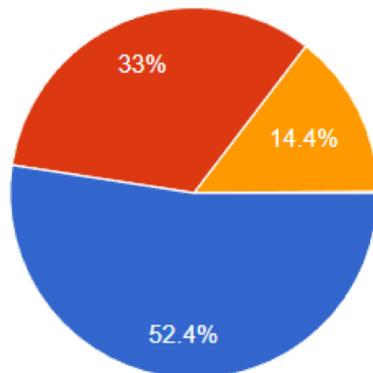
### Steering Group

**Frontiers representatives:** Ketevi Assamagan, Phil Barbeau, Nathaniel Craig, Ben Nachman, Meenakshi Narain, John Orrell, Alexey Petrov, Vladimir Shiltsev, Tim Tait, Elizabeth Worcester

**Snowmass Early Career:** Garvita Agarwal (PhD student), Jacob Zettlemyer (postdoc)

**CSS Local Organizing Committee:** Gordon Watts, Shih-Chieh Hsu (chairs); Alvaro E. Chavarria, Jason Detwiler, Joey Shapiro Key, Alejandro Garcia, Anna Goussiou, Laura Jeanty, Henry Lubatti, Elise Novitski, Gary Rybka, Jan Strube, Lauren Tompkins, Tien-Tien Yu

## Attendance Survey



- 727 responses!
- ~50% on email list
- ~50%+ want to attend
- Will run hybrid

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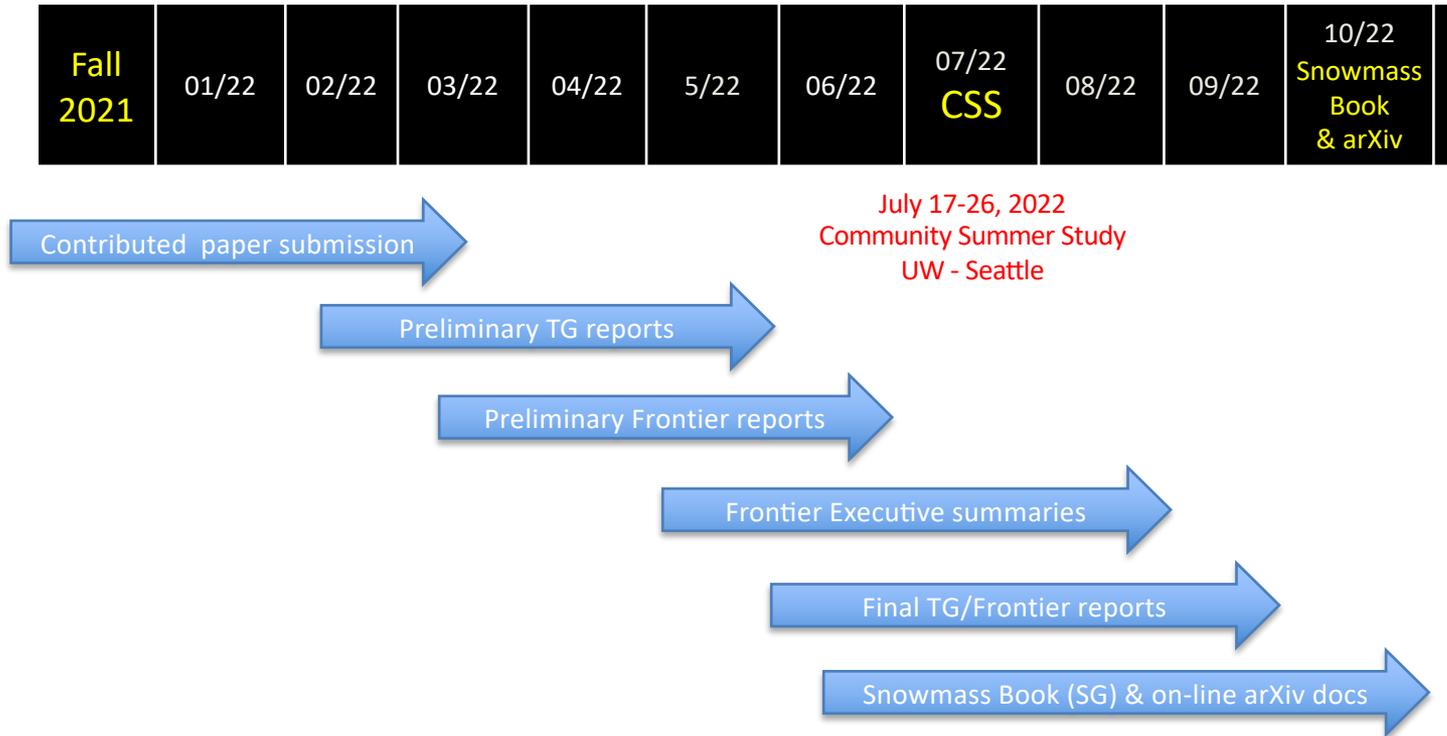
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- **Working on the full program now:**
  - First day: opening plenary
  - Last 1.5 days: concluding plenary
  - Mid-days: frontiers / TGs breakout sessions
  - Plan on outreach program!
- **Accessibility:** remote access, captioning, care-giving support, travel support for junior colleagues; a more flexible travel policy.
- **Fighting the budget constraints**



# Snowmass Timelines



- **March 15: Contributed papers (a.k.a. White Papers)**
- May 31: Preliminary Topical Group Reports
- June 30: Preliminary Frontier Reports
- **July 17 – 26: Converge on reports for all the frontiers and produce executive summaries representing the views of their communities and providing the basic input needed for P5**
- September: draft Executive Summary and Report Summary
- October- November: Snowmass Book finalized and ready for submission