

Snowmass

<https://snowmass21.org>

What is Snowmass?

“The Particle Physics Community Planning Exercise (a.k.a. “Snowmass”) is organized by the Division of Particles and Fields (DPF) of the American Physical Society”.

First Snowmass in 1982.

For a bit of history, see C. Quigg “How to Snowmass”

https://indico.fnal.gov/event/45207/attachments/133652/164937/How_to_Snowmass-final-links.pdf

Snowmass is a **scientific community study**. It provides an opportunity for the entire particle physics community to come together to identify and document a scientific vision for the future of particle physics in the U.S. and its international partners.

Snowmass will define the most important questions for the field of particle physics and identify promising opportunities to address them.“

“The P5, Particle Physics Project Prioritization Panel, will take the scientific input from Snowmass and develop a strategic plan for U.S. particle physics that can be executed over a 10 year timescale.”

Input to funding agencies and is likely to have strong impact on what does/doesn't get funding in the next ten years.

Snowmass, status

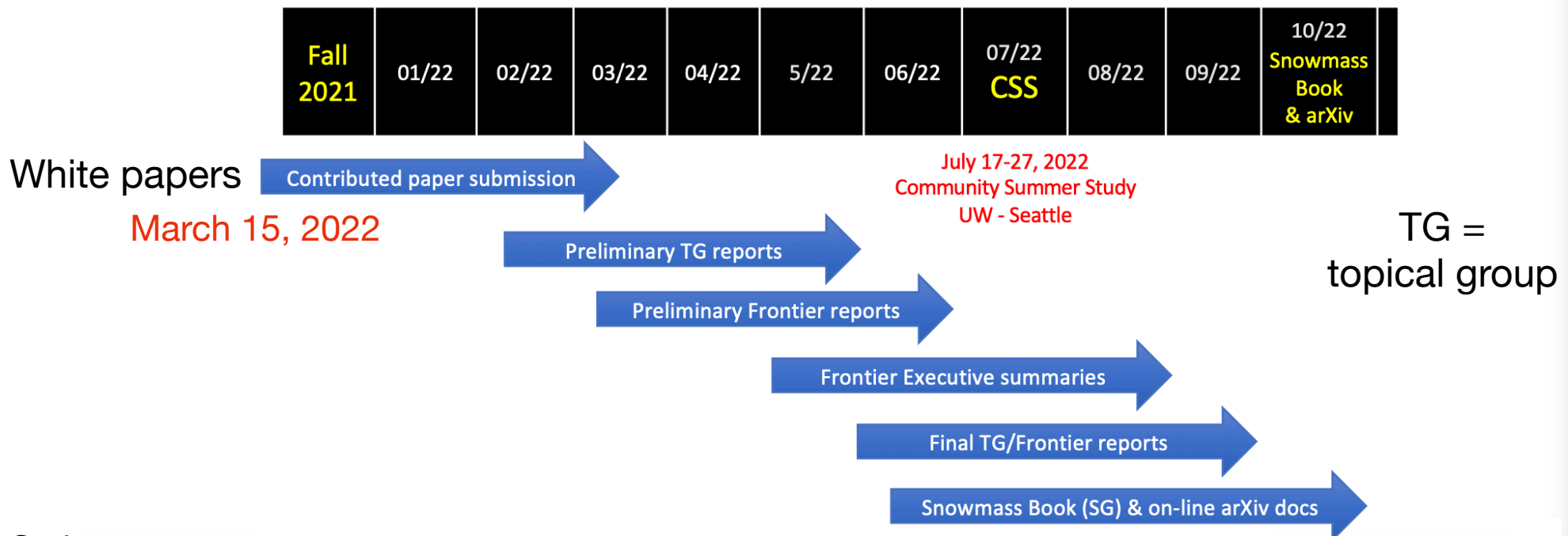
The Snowmass community effort started in April 2020.
We had a long break January 2021 to August 2021
and **we are resuming the activities now**

Half-day zoom meeting: the “Snowmass Day”, on September 24, 2021,
for all frontiers to lay out their plans forward.

<https://indico.fnal.gov/event/50538/overview> (11am - 4pm CT)

From T.Han

Snowmass Timelines



Overview of the frontiers

- Energy Frontier
- Neutrino Physics Frontier
- Rare Processes and Precision
- Cosmic Frontier
- Theory Frontier
- Accelerator Frontier
- Instrumentation Frontier
- Computational Frontier
- Underground Facilities
- Community Engagement

Overview of the frontiers

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Accelerator Frontier

S. Gourlay, T. Raubenheimer, V. Shiltsev

- AF1: Beam Physics and Accelerator Education
- AF2: Accelerators for Neutrinos
- AF3: Accelerators for EW/Higgs
- AF4: Multi-TeV Colliders
- AF5: Accelerators for PBC and Rare Processes
- AF6: Advanced Accelerator Concepts
- AF7: Accelerator Technology R&D

S.Gori

Energy Frontier

M. Narain, L. Reina, A. Tricoli

- EF01: Higgs Boson properties and couplings
- EF02: Higgs Boson as a portal to new physics
- EF03: Heavy flavor and top quark physics
- EF04: EW Precision Physics and constraining new physics
- EF05: Precision QCD
- EF06: Hadronic structure and forward QCD
- EF07: QCD and strong interactions
- EF08: BSM: Model specific explorations
- EF09: BSM: More general explorations
- EF10: BSM: Dark Matter at colliders

Rare Processes and Precision

M. Artuso, B. Bernstein, A. Petrov

- RF1: Weak decays of b and c quarks
- RF2: Weak decays of strange and light quarks
- RF3: Fundamental Physics in Small Experiments
- RF4: Baryon and Lepton Number Violating Processes
- RF5: Charged Lepton Flavor Violation
- RF6: Dark Sector Studies at High Intensities
- RF7: Hadron Spectroscopy

Topical groups

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Energy Frontier

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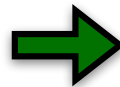
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Topical groups



RF6 (dark sectors at high intensity) overview

Topical conveners: SG (sgori@ucsc.edu), Mike Williams (mwill@mit.edu)

<https://snowmass21.org/rare/dark>

* To join our **mailing list**: Send an e-mail message to listserv@fnal.gov
Leave the subject line blank Type “SUBSCRIBE SNOWMASS-RPF-06-DARK-SECTOR
FIRSTNAME LASTNAME”

Or join our **SLACK channel**: #rpf-06-dark-sector

*** We welcome white papers! (by March 15, 2022)**

* In addition, we plan **4 solicited white papers**:

1. Detect dark matter particle production (production reaction or through subsequent DM scattering), with a focus on exploring sensitivity to thermal DM interaction strengths.
 2. Explore the structure of the dark sector by producing and detecting unstable dark particles: Minimal Portal Interactions.
 3. New Flavors and Rich Structures in Dark Sectors.
- + [white paper on experiments/facilities/tools](#)

<https://docs.google.com/document/d/1iD2ZZvVoLv3x-RaLthCo8KGGK--2MvSxcn8vrkxtRbWM/edit>

ILC White paper

From Michael's discussion:

“The International Linear Collider: Report to Snowmass 2022”

<https://www.overleaf.com/project/5feb77d659085f27f0653fa4>

In particular, chapter 11:

11 ILC Fixed-Target Program	121
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11.4 Nuclear and Hadron Physics with Electron and Positron Beams	122
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I will reach out to ask you a short summary about your project.
Feel free to contact me (sgori@ucsc.edu)

Goal: have a **good first draft** before the ILCX meeting