

“Straw-person” Snowmass 2021 Report Structure: similar to the Snowmass 2013 Report

- Executive Summary (~50 pages) including summary + a few pages each Frontier
 - Written by the Steering Group + Frontier Conveners + Editor
- Frontier Report
 - Frontier Summary (20 ~ 50 pages) by Frontier conveners
 - Topical Group Reports (20 ~ 50 pages per TG) by TG conveners
- White Papers (or Contributed Papers) - these will appear under Frontier or TG sections.

“Straw-person” Snowmass Timeline

Stage 1: Now - October 31, 2020

- Primary topical groups (TGs) acknowledge LOIs (email to primary contacts)
- Frontiers and TGs use the CPM to identify gaps and to strengthen connections to other frontiers and between TGs within their frontier, and update inter-frontier working groups

Stage 2: November 1 - December 31, 2020

- Each TG writes a ~2 paragraphs on community input (e.g., Letters of Interest and interests expressed via other formats) à Each Frontier reviews and polishes the “community input” document, releases it to the community, and invites comments from the community.
- TGs initiate Contributed Paper consolidation and coordination, and solicit Contributed Papers (e.g., Contributed Paper kickoff workshops)
- Each TG drafts “Focus Questions” & Physics Landscape.

Stage 3: January 1 – Mid February, 2021

- TG groups receive a “Preview Summary” (~2 paragraphs) for ALL planned and submitted Contributed Papers. This will be used as the base information for the TG report and allow TG conveners to coordinate the content of their report with other Frontiers.
- Each TG writes an “Outline” of their report.

Stage 4: Mid February - April 16 (April 17-20, 2021: APS April Meeting)

1. Community comment period on the Outline
2. Each TG writes an “Extended Outline” of their report
3. Community comment period on the Extended Outline

Stage 5: April 21 - July 8, 2021 (July 9-19, 2021: CSS Meeting at Seattle)

1. Frontier / TG conveners write the “DRAFT Frontier Report”.
2. Steering Group / Frontier Conveners write the “DRAFT Executive Summary”

3. Community comment period on the DRAFT Frontier Report and DRAFT Executive Summary

Stage 6: July CSS Meeting - October 2021

1. (July 31) Deadline for “Contributed Papers”
2. Input from the CSS meeting will be implemented in the Snowmass Draft Report.
3. (October 31) The final report will be produced.

Snowmass Planning Documents

1. Each frontier drafts a preliminary one-page “Snowmass Planning” document by September 16. This document contains how each frontier foresees their steps needed to converge toward the Snowmass 2021 report.
2. We will make every frontier’s document accessible to all frontier conveners so that frontiers can share their plans and learn from each other. The Steering Group will also provide comments on these documents. (all Snowmass conveners meeting on September 21)
3. Each frontier revises their “Snowmass Planning” document by September 31.
4. Each frontier discusses their plan and further develops it within their community during the CPM
5. Based on the discussions during the CPM, each frontier finalizes their “Snowmass Planning” document by the end of October 2020.
6. The Steering group and the frontier Conveners meet to discuss the plans to identify any omissions or needed revisions when they are considered as a whole and modify them accordingly.
7. The plans are made known to the community and may be further adjusted based on feedback.

Energy Frontier Plan (DRAFT)

The Energy Frontier group plans to develop the final report in four steps as outlined below.

Step 1: by Fall (before Thanksgiving).

- Define the list of “Focus Questions” from each Topical Group [already started for the EF July 2020 workshop].
 - We have started an EF draft report which will be our path towards the final report.
 - Please see the link in overleaf --- <https://www.overleaf.com/read/ynhmkwtdxrdj>
- Add an overview of the physics landscape for each topical group.
- Add community input based on a paragraph or two from all expressions of interests, ongoing efforts and the Letters of Interest which have been received by the EF.
- After a review by EF conveners and possibly a group of “reviewers”, we release this document to the community by early December and invite comments.

Step 2: by mid May

- Request “two paragraph summaries” for ALL planned and submitted contributed papers which are to be included in the EF report by the community to the respective TG chapters. Results need not be final!
 - We will set up a Google form for submission of these “two paragraph summaries” to EF categorized by TGs.
- We need this “preview summary” of the contributed papers, so that we have a good overview of the content of the EF report. TG conveners will use these summaries as the base information and can start writing the respective TG chapters.
- The contributed papers which may not have submitted their “two paragraph summaries” to EF by this date may be difficult to accommodate in the final report.
- Note - from the ESG Yellow report for HL-LHC experience - this interim step will help us understand the overall picture of the report and find any inconsistencies between results or missing pieces.
 - This will allow for large collaborations, the necessary two months period [May-July] for internal approval of the final result for their final contributed paper. This will also give the TG conveners an opportunity to provide their feedback to the contributors for the final contributed report by the end of July.
 - This will allow EF TG conveners to coordinate the content of the chapters with the other Frontiers [TF, IF, AF, RF, CF, NF, etc].

Step 3: by July meeting in Seattle

- TG conveners review the input from the community and finalize their chapters.
- The deadline for a Snowmass contributed paper is July 31, 2021.

Step 4: the final report

- Update the results / summaries to align with the final version of the contributed papers.
- EF conveners and TG conveners summarize the outcomes and finalize the report by Oct 2021

Neutrino Frontier Snowmass Planning Document (DRAFT)

Timeline

- CPM meeting: October 3-5. Identify overlap areas, initiate white paper consolidation and coordination.
- NF white paper kickoff virtual workshop: Nov or Dec, TBD. First draft outline of report presented, consolidate and coordinate NF white papers based on LOIs and CPM discussion.
- Decision on whether NF Meeting to be virtual, hybrid or in-person: January 15, 2021.
- NF white paper “previews”: February 1, 2021. We are hoping for information from community members about which white papers will be submitted and what their general content will be. Full white papers by this date are of course most welcome. Input submitted to the conveners by this date will be guaranteed consideration for inclusion in the NF report.
- First draft (extended outline) of NF report: March 1, 2021
- First draft community comment period: March 1-April 23, 2021
- Neutrino Frontier Meeting: March 15-17, 2021
- APS meeting: April 17-20, 2021
- Second draft of NF report: May 10, 2021
- Second draft community comment period: May 10-31, 2021
- Third draft of NF report: June 15, 2021
- Third draft community comment period: June 15-July 31, 2021
- Snowmass in Seattle: July 11-20, 2021
- Final white paper deadline: July 31, 2021
- Final NF report: September 1, 2021
- Final Snowmass report: October 1, 2021

We expect also community meetings (virtual) approximately every 1-2 months. Topical groups will furthermore convene multiple meetings to address specific topics.

Computational Frontier Plan (DRAFT)

We propose the following timeline in order to achieve coherent and representative reports by fall 2021. All of the bulleted items below are in addition to our regular biweekly meetings of topical group conveners and liaisons that we will be using to frequently monitor progress on our engagement with the community and investigating the challenges and opportunities in computing for future experiments and theoretical calculations.

- March 2021: Frontier-wide convener (+liaisons) meeting to summarize findings and identify challenges and opportunities.
 - Each topical group will be tasked with doing this in their domain first which may include organizational meetings and/or (virtual) workshops and then we will coordinate cross-frontier themes at the frontier-wide meeting.
- May 2021: Frontier-wide conveners (+liaisons) create a list of major findings.
- July 2021: Present major findings at Snowmass Summer Study and discuss with community, taking into account feedback.
- Fall 2021: Complete topical group and frontier-wide reports.

Community Engagement Frontier Plan (DRAFT)

- Sep 2020 – Jul 2021: Regular schedule of CEF meetings, townhalls, etc. continues
- Sep 2020: LOI sorting, Survey
 - Sort, organize and condense 73 LOIs into White Paper Work Groups (WPWG)
 - Sep 28: CEF Survey Open
- Oct 2020: CPM
 - Oct 5-8: CPM
 - Finalize WPWG organization using input from CPM sessions
 - Advertise WPWG and recruit additional participants
 - Oct 12: CEF Survey Closed
 - Oct 15: Post WPWG organization and membership on wiki
 - WPWGs post brief bi-weekly status reports on individual wikis
- November 2020: Post CEF Survey results
- December 2020: WPWG Review
 - By Dec 17: TGs receive full status reports from all WPWGs
- February: White Paper 1st Drafts
 - Feb 18: White Paper 1st Drafts submitted to TGs
- March 2021: CEF Workshop
 - Mar 15: TG Reports 1st Drafts completed
 - Mar 22-26?: CEF Workshop (BNL)
 - White Paper Final Drafts posted
 - Identify steps to finalize TG Reports
 - Develop structure, outline of CEF Report
- April 2021: CMM
 - Apr 12: TG Reports 2nd Drafts posted
 - Apr 17-20: CMM (APS)
 - Present TG Reports to community and receive feedback
 - Apr 30: TG Reports 3rd Drafts completed and posted
- June 2021: CEF TGC Workshop
 - Jun 1: CEF Report 1st Draft completed
 - Jun 8-10: CEF TGC Workshop
 - Review CEF Report
 - Plan for CSS
 - Jun 28: CEF Report 2nd Draft completed and posted
- July 2021: CSS
 - Jul 11-20: CSS
 - Present and review all CEF Reports and incorporate feedback
 - Jul 23: TG Reports Final Drafts
 - Jul 30: CEF Report Final Draft
- August 2021: Snowmass Report 1st Draft
- October 2021: Snowmass Report Final Draft

Accelerator Frontier Plan (DRAFT)

Over 300 Letters of Interest were submitted to the Accelerator Frontier (AF) with the majority of them listing AF as the primary.

We have made every effort to provide an opportunity for the community to participate in the Snowmass process. However, given the breadth of topics relative to the amount of time for discussion, we invite anyone who feels that their input was not adequately represented to contact us after the meeting.

Following the Community Planning Meeting we propose the following action items for the Topical Working Group Convenors.

- 1) Consolidate topical areas where possible and encourage joint contributed papers.
- 2) Generate a draft outline of their section of the Snowmass Report to try and identify gaps based on input from the CPM.
- 3) Create focused working groups to fill gaps and implement 1).
- 4) Schedule workshops and meetings in coordination with AF convenors to complete tasks 1) and 2).
- 5) Compile a living list of planned and proposed AF as well as other Frontier workshops over the next 9 months.

Accelerator Co-Convenors will launch the following ancillary activities.

- 1) Launch the “Implementation Task Force (ITF).”

One of the key goals of the Snowmass’21 Accelerator Frontier is to address the question “...What are the time and cost scales of the R&D and associated test facilities as well as the time and cost scale of the facility?” One of the challenges for the Accelerator Topical groups will be to compare the expected cost scales, schedule, and R&D status for the projects as they will be at varied stages of development and possibly proposed using different accounting rules. An Accelerator Implementation Task Force has been formed and charged with developing metrics and processes to facilitate such a comparison between projects. The ITF has 9 members, including the Chair and the three Accelerator Frontier co-convenors.

- 2) Create an ad hoc working group to identify Accelerator R&D funding sources and trends since the last Snowmass.
- 3) Generate the overall draft outline of the Snowmass Report based on input from the AF Topical Groups in order to define and guide the continued process.

Rare and Precision Frontier Plan (DRAFT)

Our intent is to produce a coherent document in the style of the European Strategy document. We want to set forth the ideas in the community, relate them, and put them in context, but without making recommendations.

1. Sep 2020-November 2020: read and evaluate LOIs.
 - a. Which groups should meld efforts?
 - b. What synergies are there among LOIs?
 - c. What other Frontiers need to be involved and are they?
 - d. Are there themes and possibly P5 level decisions that emerge from those themes?
 - e. Are there community-wide issues raised that we should discuss with all Frontiers (e.g GEANT support)?
2. November 2020-April 2021
 - a. Work with LOI (and new) advocates to produce contributed papers
 - b. progress reports on contributed papers from LOI /new authors to Topical Conveners
 - c. Topical Conveners and Frontier Conveners continue to meet and discuss progress on contributed papers
 - d. Topical Conveners and Frontier Conveners extract themes and overall picture for each topical group and how different TGs within and outside Frontier relate: develop a synthesis of contributed papers.
 - e. outline of studies and benchmarks for the final document and start working on main topics; collaboration among TG conveners, Frontier Conveners, and community
 - f. Draft contributed paper writing.
 - g. Check that cross-TG and cross-Frontier links are being made
 - h. Proponents develop next iteration of draft contributed papers after g.
3. May 2021: Frontier Planning Meeting
 - a. Proponents present status and draft contributed papers
4. June-July 2021
 - a. Frontier Conveners and TG conveners collaborate to produce an outline/early draft of the RPF chapter. Solicit input from other Frontiers and discuss overlaps.
 - b. Prepare report on major themes for Snowmass July 2021. Organize Snowmass 2021 efforts for actual conference.
5. July-Oct 2021
 - a. Frontier Conveners write the RPF report collaboratively with TG conveners.

During this time, there will be regular meetings of the TG conveners and smaller meetings of TG conveners with Frontier Conveners to coordinate efforts and monitor progress.

Instrumentation Frontier (DRAFT)

We will continue to have regular convener and topical group meetings, where we discuss the process as well as individual LOIs or technological themes. IF has received a total of 197 LOIs with IF as primary recipient, plus an additional 147 LOIs to other frontiers and flagged as IF. We will continue to discuss the LOIs in our regular topical working group meetings and start to form collaborations and discussions where synergies exist. A rough timeline leading to a final Snowmass report follows:

1. October 5-8, 2020, CPM:
 - a. Intensive discussions with other frontiers, in particular physics frontiers (EF, NF, RPF, CF), to make sure scientific needs by other frontiers in detector technology are being addressed in the LOIs by the community. Identify holes and address them.
 - b. Present summaries of LOIs, emerging themes, surprising new ideas, potential synergies and start building collaborations. Strong participation from the community is crucial here.
2. October 2020 - March 2021:
 - a. Continue TG meetings and updates from LOI collaborations, white paper status and plans.
 - b. Organize inter-Frontier workshops (with EF/RPF/AF and NF/CF/UF)
 - c. November 10-12, 2020: MultiHEP workshop at Berkeley (virtual), called by IF09.
 - i. Intended to collect experience on successes, challenges, and lessons about multi-disciplinary collaborations to further or spin-off High Energy Physics R&D.
3. March 17-20, 2021, CPAD Workshop (virtual):
 - a. Parallel sessions to be organized by IF TG conveners with goal to review emerging white papers. Community engagement!
 - b. Aiming for the program to facilitate cross fertilization in particular with the NP/EIC community, but could also organize dedicated sessions for condensed matter/material science or QIS.
 - c. Tentative agreement with NF for a common day. But maybe this could be better moved to a different week nearby? Maybe one or two weeks after our two workshops?
4. March 31, 2021: deadline for draft white papers and start to organize by TG a rough draft report with short summaries of these along technological themes.
5. May 31, 2021: First complete draft of IF report by TG. Identify and resolve overlapping areas and gaps. Make additional push to community to finalize white papers. Consult with other Frontiers with the help of the liaisons to make sure physics and technology aspects of the respective reports are aligned.
6. July 11-20, 2021: CSS workshop: update report with current white papers, further communications and consolidations with other Frontiers.
7. July 31, 2021: final deadline for white papers. Start updating draft report with final white papers and anything that has come up during the CSS workshop.
8. October 2021: finalize report.

Theory Frontier Plan (Draft)

Broadly, the goal of the Theory Frontier is to articulate the vibrancy of theory within high-energy physics (both in relation to projects and in its own right), highlighting exciting developments in recent years and promising directions for the coming decade. As a cross-cutting frontier, the Theory Frontier also aims to facilitate theory-related activities in and across other frontiers. We aim to achieve these goals through the following stages:

Stage 1 [Now-CPM (10/20)]

- Each topical group (TG) acknowledges LOIs for which it is the primary TG (*in progress*).
- All TGs solicit White Papers (*in progress*).
- Use CPM to strengthen connections to other frontiers and between TGs within TF. Highlight theory contributions to interesting new ideas (LOIs). Identify possible inter-frontier WPs, consolidate existing plans for WPs.

Stage 2 [CPM (10/20) – TF Meeting (3/21)]

- Each TG monitors progress of WPs in TF.
- TF conveners meet regularly with inter-frontier liaisons to coordinate activities between frontiers.
- Preparation for selecting speakers representing each TG at the TF Meeting
- Preview WPs in dedicated session(s) at the TF meeting.
- Use TF meetings to consolidate & connect theory activities across frontiers, update on progress of WPs in other frontiers.

Stage 3 [TF Meeting (3/21) – CSS (7/21)]

- All planned WPs submit 1-paragraph summaries by April 15 to a common Google Doc.
- Use WP summaries to begin outlining TG summary documents, complete detailed outlines by May 15.
- Use TG summary outlines to prepare TF summary outline by June 1.
- First draft of TG summary documents using submitted WPs and summaries of forthcoming WPs, complete by June 15. First draft TF summary complete by July 1 for comment before CSS.
- Preparation for CSS - selecting speakers, partly based on WP's received/in progress.
- Use CSS to highlight major themes developing in white papers and summary documents, take community input on draft of summary documents.

Stage 4 [CSS (7/21) – Final Report (10/21)]

- Finalize WPs by 7/31/21.
- Complete second drafts of TG summaries by 9/1, and TF summary by 9/15, take community input.
- Finalize TG and TF summaries by 10/21.

Cosmic Frontier Plan (Draft)

The plan for the Cosmic Frontier to prepare its report for Snowmass 2021 follows the general outline for the Snowmass process. Topical working groups are now meeting biweekly or more frequently, and there are weekly to biweekly meetings of the Cosmic Frontier conveners and liaisons to discuss issues as they arise. Each topical group will ultimately prepare a chapter of the final Cosmic Frontier report, aided by the relevant portions of the community according to the timeline:

- October 2020: The Community planning meeting will chart the over-all direction for each working group, allow for planning with other frontiers concerns points of mutual interest.
- Topical groups will work with LOI authors to coordinate the studies needed to provide the input for their working group reports. Each topical group will organize one-day zoom workshops as necessary.
- February to March 2021: Two Cosmic frontier-wide (virtual) meetings will take place, to coordinate the material for the working group reports and harmonize topics across working groups.
- May 2021: Draft reports for each topical working group will be assembled, and discussed with the community via topical working group meetings.
- July 2021: The major findings will be presented at the Snowmass 2021 Summer Study meeting, and revised according to input from the community and updated results.
- Fall 2021: The final reports are due.