

CF03: Cosmic Probes of Dark Matter Physics

2021 August Meeting

SnowMass2021

August 30, 2021

Outline

- Recap: timeline and our to-do list
- Updates from each white paper working group
- CF03 Solicited White Paper FAQ
- Discussion on future planning

CF3 “Solicited” White Paper Topics

- **Dark matter physics from halo measurements** [[#wp-cf03-dark_matter_halos](#)]
Dark matter physics from dark matter halos ranging from large-scale structure to sub-galactic scales.
Facilitators: **Keith Bechtol, Simon Birrer, Francis-Yan Cyr-Racine, Katelin Schutz**
- **Primordial Black Holes & Gravitational Waves** [[#wp-cf03-dark_matter_pbh_gw](#)]
Primordial black holes as dark matter and probes of inflation (joint with CF7?)
Facilitators: **Andrea Albert, Simeon Bird, Will Dawson**
- **Numerical simulations and systematics** [[#wp-cf03-dark_matter_sims](#)]
Importance of numerical simulations for extracting dark matter physics (joint with CompF2?)
Facilitators: **Arka Banerjee, Annika Peter, Ferah Munshi**
- **Connecting dark matter to early universe physics** [[#wp-cf03-dark_matter_early_universe](#)]
Light relics, 21cm (EDGES), etc. (joint with CF5 & TF9?)
Facilitators: **Kim Boddy, Cora Dvorkin, Vera Gluscevic, Julian Muñoz**
- **Dark matter physics in extreme astrophysical environments** [[#wp-cf03-dark_matter_xtreme](#)]
Includes stellar interiors, neutron stars, non-primordial black holes (joint with TF9?)
Facilitators: **Masha Baryakhtar, Regina Caputo, Djuna Croon, Kerstin Perez**
- **Facilities for cosmic probes of dark matter physics** [[#wp-cf03-dark_matter_facilities](#)]
Proposed facilities for cosmic probes of dark matter including MSE, MegaMapper, CMB-HD, etc.
Facilitators: **Ting Li, Josh Simon, Sukanya Chakrabarti, Neelima Sehgal**

DPF Timeline from Tao Han (APS DPF Chair) in the January Snowmass newsletter

- White Paper submission to arXiv: no later than March 15, 2022. Late submissions and updates are likely not to be incorporated in the working group reports, but will be included in the Snowmass online archive documents.
- Preliminary reports by the Topical Groups due: no later than May 31, 2022.
- Preliminary reports by the Frontiers due: no later than June 30, 2022.
- Snowmass Community Summer Study (CSS): July, 2022 at UW-Seattle.
- All final reports by TGs and Frontiers due: no later than September 30, 2022.
- Snowmass Book and the on-line archive documents due: October 31, 2022.

CF03 Internal White Paper Timeline (updated)



Proposed timeline for paper writing:

- Mid-November 2020: identify “solicited” white papers and “facilitators”
- August 30, 2021: identify writers for each white paper
- October 18, 2021: White paper outlines/skeletons -- what will the paper cover, begin to articulate key questions and opportunities; identify key questions and opportunities for each white paper
- January 17, 2022: first draft of white paper to CF03 conveners, for feedback and discussion; share among sub working groups; reminder, topical group report is written in parallel to white papers (so need to know early)
- On the deadline dates, we also have CF03 meetings
- February-Mid March 2022: further polish the white papers and submit them

CF03 Internal White Paper Timeline (updated)



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https://docs.google.com/document/d/1_T3FHmVN6Tq3H-BeycpxZrGCfqeD35Hht3rnBDtH9Y/edit?usp=sharing

Need input from each white paper working group

Discussion: Is the contributor list representative/comprehensive?

Mechanisms to include more later?

CF03 Solicited White Paper FAQ

<https://docs.google.com/document/d/1S9LQmqyq83mp2osJXvkNjAg8cSzrk3W4LFLJAXxLLe8/edit?usp=sharing>

Initiated by questions from the Facilities for cosmic probes of dark matter physics facilitators

Plan for the October meeting



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Discussion

- October 18, 2021: White paper outlines/skeletons -- what will the paper cover, begin to articulate key questions and opportunities; identify key questions and opportunities for each white paper

Is the timeline reasonable? Is the goal achievable?

How to coordinate the work within each white paper?

How to organize meetings from now to October 18 with or without the conveners (the hyphenated)?

Ideas for running a CF03 workshop between January-March (February) 2022? [from the last meeting]