



# The Multimessenger Science and Facilities Snowmass White Paper

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# Snowmass Flow

1. White papers like this one inform frontier topical report(s) (CF7 in this case)
2. Frontier topical reports inform frontier reports (Cosmic Frontier in this case)
3. Frontier reports inform the Snowmass Report
4. The Snowmass Report informs the P5 report
5. The P5 report is the guide for HEP funding in the US for the next decade

## Goals of the white paper

- To provide an outlook of MM science for the next two decades.
- To provide a blueprint of a portfolio of facilities and experiments that will collectively realize the 20-year vision of MM science.

## Goals for this workshop

- Inform the community about the white paper
- Solicit input on the goals, organizational structure and outline, and content of the white paper
- Encourage contributions from everyone

# WP Philosophy

Key questions to be addressed:

1. What is the current status of the field?
2. What facilities and capabilities will we have or develop in the next decade and what kinds of MM science will be achievable with these capabilities?
3. What are the big questions that will require a new generation (~20+ years) of MM facilities?

A note about scope:

- Each messenger has at least one solicited Snowmass white paper; our focus is on science that is enabled by observations and detections in more than one messenger

# Preliminary Outline

## Executive Summary

### 1. Introduction

- a. Current Status of Multimessenger Science
- b. Multimessenger Science in the Next Two Decades (General Discussion)

### 2. Multimessenger Synergies in Astrophysics

- a. Stellar Mass Compact Object Binaries
- b. Massive Compact Object Binaries
- c. Active Galactic Nuclei
- d. Tidal Disruption Events
- e. Other Transients
- f. Diffuse Backgrounds
- g. BSM/Tests of Fundamental Physics

### 3. The Current and Future Multimessenger Network

- a. The Current Landscape and Planned Enhancements
- b. The Multimessenger Vision
- c. Facilities
  - i. List of Facilities
  - ii. Complimentary b/w Facilities

### 4. Conclusions

# Timeline

1. Rough drafts of contributions: Dec. 10
2. Semi-final draft: Jan. 21
3. Circulate final draft: Jan. 31
4. Final comments due: Mar. 1
5. Contributed white paper deadline: Mar. 15

# Some Logistics

- Overleaf link (read-only): <https://www.overleaf.com/read/kzyjhmbjkytf>
- Snowmass Slack channel: #wp-cf07-multi-messenger
- To contribute, contact conveners (emails on first slide; slack channel) with:
  - Your name and affiliation
  - Topic(s) you want to contribute to
  - Acknowledgements
- Use standard Inspire HEP bibtex references
- **Don't copy text**
- **Don't screenshot images** (get images from arXiv and include the reference in the caption)
  - We'll likely need to **obtain permissions for use**