



U.S. DEPARTMENT OF
ENERGY

Office of
Science

DOE HEP Cosmic Frontier – Astro2020 discussion at AAAC

Astronomy & Astrophysics Advisory Committee

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*Experimental Research at the Cosmic Frontier
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HEP & Astro2020

Astro2020 – Statement of Task:

- Identify the most compelling science challenges and frontiers in astronomy and astrophysics, which shall motivate the committee's strategy for the future;
- Develop a comprehensive research strategy to advance the frontiers of astronomy and astrophysics for the period 2022-2032.

→Guidance from Astro2020 will inform HEP on

- Compelling, high impact opportunities that align with our science priorities and make use of HEP community's capabilities
 - where DOE HEP researchers and investments can play a significant role in and make unique, significant and necessary contributions (PASAG criteria) that make use of our capabilities and expertise
- Partnerships with NASA, NSF & international collaborators as appropriate
- Consider need for Research support, Experimental Operations, Computing resources, technology development, etc.



Cosmic Frontier – Efforts & Planning Relevant for Astro2020

- ▶ **CMB-S4** is being proposed to Astro 2020 as a partnership of DOE-HEP, NSF-AST/PHY/OPP.
 - ▶ **HEP is moving forward on CMB-S4 as recommended in our 2014 P5 strategic plan**
- ▶ **Dark Energy** – science ideas for enhancing and going beyond DESI and LSST being proposed to Astro 2020; We are interested in small, medium, large scale project ideas; also consider how to coordinate data across experiments to optimize science.
- ▶ **Dark Matter Direct Detection** – excluded in SOT due to purview of HEP/Particle Physics community; fully informed by HEPAP/P5
- ▶ **Exploring the Unknown** – always interested in exciting new physics ideas central our mission

HEP Cosmic Frontier is dynamic – the community & HEP are always looking for high scientific impact opportunities that align with our science goals & make use of HEP community's capabilities.

HEP Strategic Planning Timeline

→ Preparing for next Strategic Plan:

- ▶ HEP community-wide “Snowmass” study process organized by the Division of Particles and Fields (DPF) of the American Physical Society (APS) has begun
 - Status (see Snowmass page: <https://snowmass21.org/start>)
 - Kick-off at the 2020 Virtual April APS meeting
 - Several Snowmass working group meetings & study sessions now progressing...
 - Final “large” Snowmass Meeting scheduled for July 11-20, 2021, at University of Washington
 - New National Academy of Sciences (NAS) Decadal Survey planned to overlap with Snowmass process to enable addressing full breadth of particle and astroparticle physics
 - Next P5 strategy/prioritization process to begin after Snowmass and NAS Decadal Survey, circa end of CY 2021: **P5 report by Nov-Dec 2022 to inform FY 2024 & 2025 budgets**

