



U.S. DEPARTMENT OF
ENERGY

Office of
Science

DOE Status Update

March 7th, 2022

Office of High Energy Physics

Presenter: Jim Siegrist

Science Highlights



March 2022 Status on DESI



DESI taking data at full speed

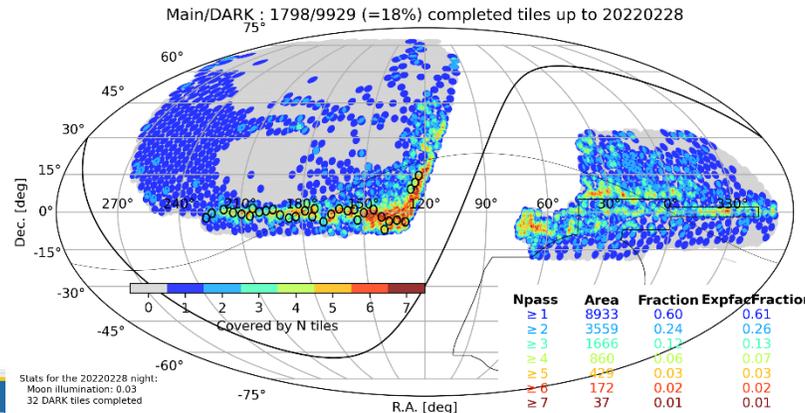
- ↪ Instrument working remarkably well – reaching 150k spectra in a single night
- ↪ Passed the 10M redshift bar on February 13, 2022 (exceeding all previous spectroscopic samples)
- ↪ Now building up depth to achieve 1500-2000 deg² at nearly full depth for year-1 Key Projects
- ↪ Internal release in Feb. 28, 2022 of
- ↪ Commissioning + Survey Validation data to become **first DESI data release** by end 2022
- ↪ First 2 months DESI data (unblinded) for analysis tuning (following data blinded for year 1 analyses)



DESI coyote mascot recently named BaoBan* by Tohono O'odham Nation Youth Council

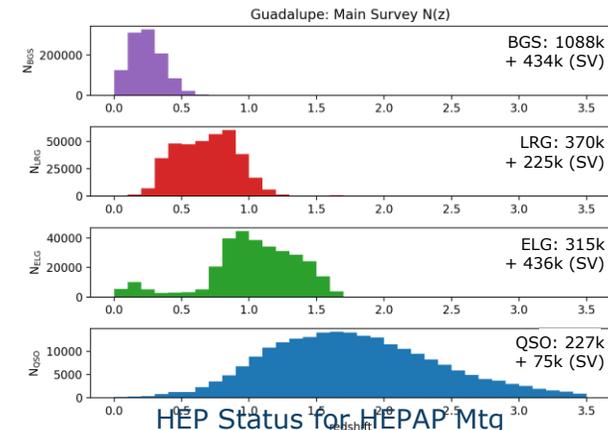
*connects Ban (O'odham word for coyote) with DESI observable BAO (which is also the sound a coyote makes)

Footprint coverage to date



7 March 2022

Redshift distribution (internal data release)



U.S. DEPARTMENT OF ENERGY

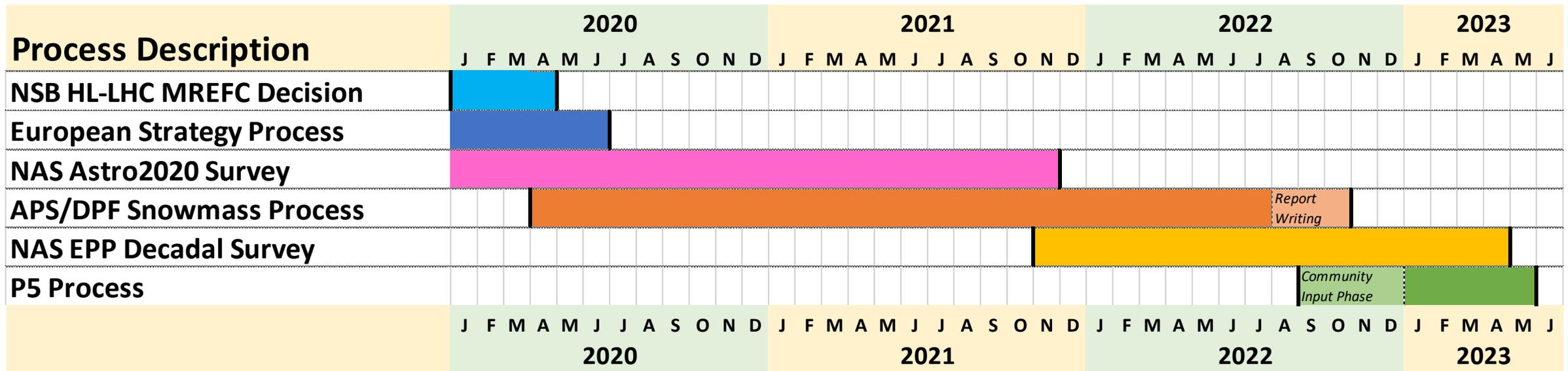
Office of Science

HEP Next Strategic Planning Timeline

HEP community-wide “Snowmass” study process organized by the Division of Particles and Fields (DPF) of the American Physical Society (APS) has restarted.

New National Academy of Sciences (NAS) Elementary Particle Physics (EPP) Decadal Survey will run concurrently with and complement the community-driven Snowmass process. They are working on establishing the committee currently.

Next P5 process to begin after Snowmass and NAS Decadal Survey, circa late 2022: P5 report by May 2023 will inform FY 2024 Congressional actions & FY 2025 U.S. budget formulation



Return to (On-Site) Work

- ▶ The DOE labs are all reopening under plans developed by each lab. **Fermilab is allowing users to return.**
- ▶ Re-entry for DOE SC staff beginning March 14:
 - ▶ For HEP, **most staff will be in the office only 1-2 days a week** to start, telework other days.
 - ▶ Work schedules are staggered through the week to keep overall occupancy low.
 - ▶ Prioritizing in-person opportunities for new staff
 - ▶ Expect slow ramp-up to higher average occupancy.
 - ▶ **No HEP meetings in DOE Germantown office** (other than DOE staff) for the time being
 - ▶ HEP-hosted meetings off-site (e.g., Reviews) possible on a case-by-case basis, see also next slide

Conferences, Workshop, Travel

- ▶ Requests for in-person Conference or workshop support, for events **after March 14**, will be considered on a case-by-case basis.
- ▶ Organizers will need to spell out their COVID mitigation strategies and plans for reverting to hybrid or virtual meetings if circumstances dictate
- ▶ Expect additional time will be required for approvals
- ▶ Domestic travel requests will continue to follow local approval processes.
- ▶ Travel by HEP staff will re-start as needed, following SC process and office priorities. Developing FY 2022 office travel plan now.

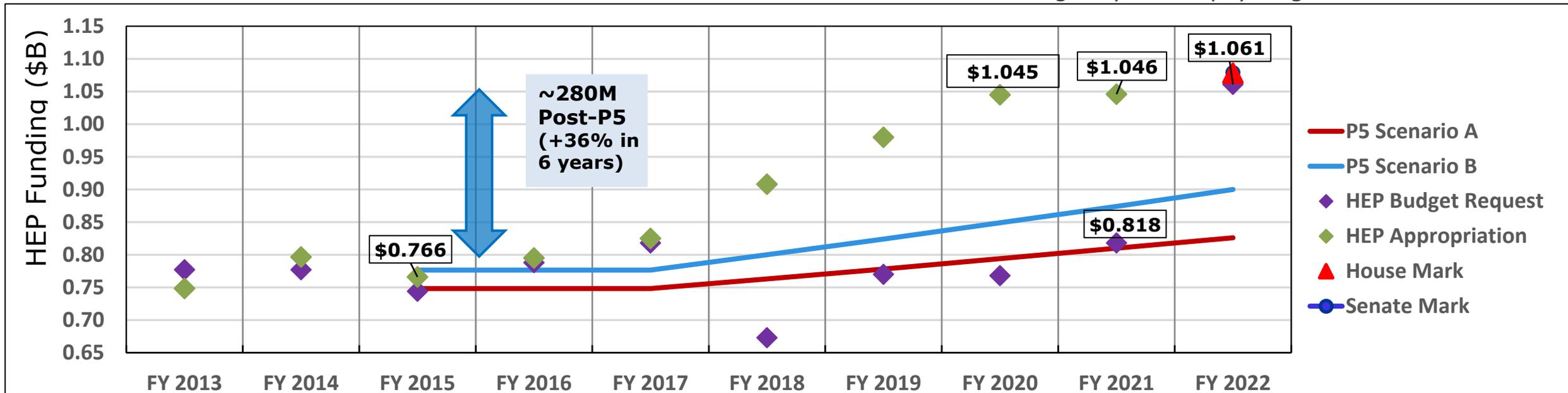
FY 2022 HEP Budget Request & SC Initiatives

▶ New Research Initiatives

1. Biopreparedness Research Virtual Environment
2. Fundamental Science to Transform Advanced Manufacturing
3. **Integrated Computational and Data Infrastructure**
4. **Reaching a New Energy Sciences Workforce**

▶ Ongoing Research Initiatives

1. **Accelerator Science and Technology Initiative**
2. **Artificial Intelligence and Machine Learning**
3. Critical Materials/Minerals
4. Exascale Computing Crosscut
5. **Microelectronics**
6. **Quantum Information Science**
7. Revolutionizing Polymers Upcycling



High Energy Physics

Understanding how the universe works at its most fundamental level

- The **FY 2022 Request for \$1,061.0 million** will focus support on the highest priority elements identified in the 2014 High Energy Physics Advisory Panel Particle Physics Project Prioritization Panel (P5) Report, **addressing the science drivers of particle physics: Higgs boson, neutrinos, dark matter, dark energy, and exploring the unknown**
- The Request will provide continued support for **university and laboratory researchers carrying on critical core competencies**; enable high priority theoretical and experimental activities in pursuit of discovery science; **foster a diverse, inclusive, highly skilled, American workforce**; build R&D capacity; and conduct world-leading R&D
 - **Future Computing**: Advanced Computing (Exascale software, and Terabyte data management and storage), Quantum Information Science (QIS), and Artificial Intelligence and Machine Learning (AI/ML)
 - **Advanced Technology R&D**: QIS, Accelerator Science & Technology, and Microelectronics
 - **Removing Barriers & Creating Opportunities**: Reaching a New Energy Sciences Workforce (RENEW); HEP Traineeships in Acceleration Science and Engineering, and Instrumentation
- **Support for BNL Accelerator Test Facility moves to the ARDRP program**



Main Injector at the Fermilab Accelerator Complex



ICARUS detector at Fermi National Accelerator Laboratory



Muon g-2 Experiment at Fermi National Accelerator Laboratory



LZ direct dark matter search experiment at SURF



CMS Detector at LHC in CERN

HEP Projects Status

- ▶ LBNF/DUNE had a dual review in January 2022
 - ▶ CD-2/3 for Far Site Excavation subproject. Committee recommended proceeding to CD-2/3.
 - ▶ Evaluating progress towards CD-1RR. Saw good progress but reemphasized the need to build to cost.
- ▶ PIP II has its CD-3 review in March 2022.
 - ▶ Committee recommended proceeding to CD-3.
- ▶ HL-LHC ATLAS had a status review in January 2022.
 - ▶ The project is doing well and preparing for CD-2.
- ▶ A CD-3B review is being planned for HL-LHC CMS in April 2022
 - ▶ This review will allow continued long-lead procurements. CD-2 has been delayed by COVID-19.
- ▶ A rebaseline review for Mu2e is being planned for summer.
- ▶ A rebaseline review for HL-LHC AUP is being planned for summer.

HEP – Infrastructure Investments

- Additional investments are necessary to increase capacity and efficiency:
 - Increased demands on to deliver on large-scale projects much **greater in size, complexity, and cost** than done before (LCLS-II, LBNF/DUNE, PIP-II, Mu2e)
 - Providing **higher beam intensity**
 - Operating experiments in pursuit of discovery science at “tip of the spear” **exquisite precision and sensitivity**
 - Managing **increasing data processing and storage**
 - Supporting a **diverse, talented, demanding,** and ever-growing user population

Integrated Engineering Research Center (IERC) construction is on schedule to be completed in 2022. Demolition work inside Wilson Hall is nearly complete and renovation work has begun.



Industrial Center Building Addition received recognition as a new building that performs above code thanks to the design of its building envelope, which includes windows, exterior walls and roofs. In fact, its building envelope surpassed the award’s criteria of a 20% improvement over current building code, providing a 25% improvement.



In March 2021, contractors completed major mechanical and electrical upgrades to the Ross Hoists at SURF (originally manufactured in the 1930s). Ross Hoists will power the excavation of 800 Ktons of waste rock and serve as the conveyance for people, materials and equipment underground.

Breakthrough of pilot drift for LBNF CUC



Mu2e PS2 and PS3
Coils Mated



PIP II Cryoplant building nears completion



DE&I/STEM Update

What's New*:

- ▶ SC-level office of Workforce Diversity Equity & Inclusion (DE&I) headed by Julie Carruthers: <https://science.osti.gov/SW-DEI/About>
 - ▶ See e.g., Recommendations from the 2020 SC Working Group on DE&I
- ▶ New SC Working Groups on DE&I:
 - ▶ Implementation : phased approach to 2020 WG Recommendations
 - ▶ Engagement : "listening sessions"; approaches for increasing participation
- ▶ Agency plans responding to Executive Orders (see next slide)
- ▶ RENEW initiative in FY22 Request, HEP FOA pending
- ▶ New position for HEP DE&I Coordinator (see Org Chart)

*See also July 2020 HEPAP and August 2021 HEP PI Meeting talks by Julie for an overview of DOE SC policy and practices related to DE&I issues



Broader DE&I Initiatives in DOE

Executive Order 13985 – Advancing Racial Equity and Support for Underserved Communities through the Federal Government. Federal agencies must:

- “...conduct an equity assessment within 200 days.”
- Produce a plan within one year (January 20, 2022) to address barriers to full and equal participation.
- “...allocate resources to address the historic failure to invest sufficiently, justly, and equally in underserved communities, as well as individuals from those communities.”

Executive Order 14035 – Diversity, Equity, Inclusion and Accessibility (DEIA) in the Federal Workforce. Federal agencies must:

- Assess current practices for recruitment, hiring, promotion, retention, professional development performance evaluations, pay and compensation policies, training, etc.
- Develop an Agency DEIA Strategic Plan and report to OMB/OPM on progress.

Justice40 Initiative – Goal that 40% of the overall benefits of Federal Investments flow to disadvantaged communities.

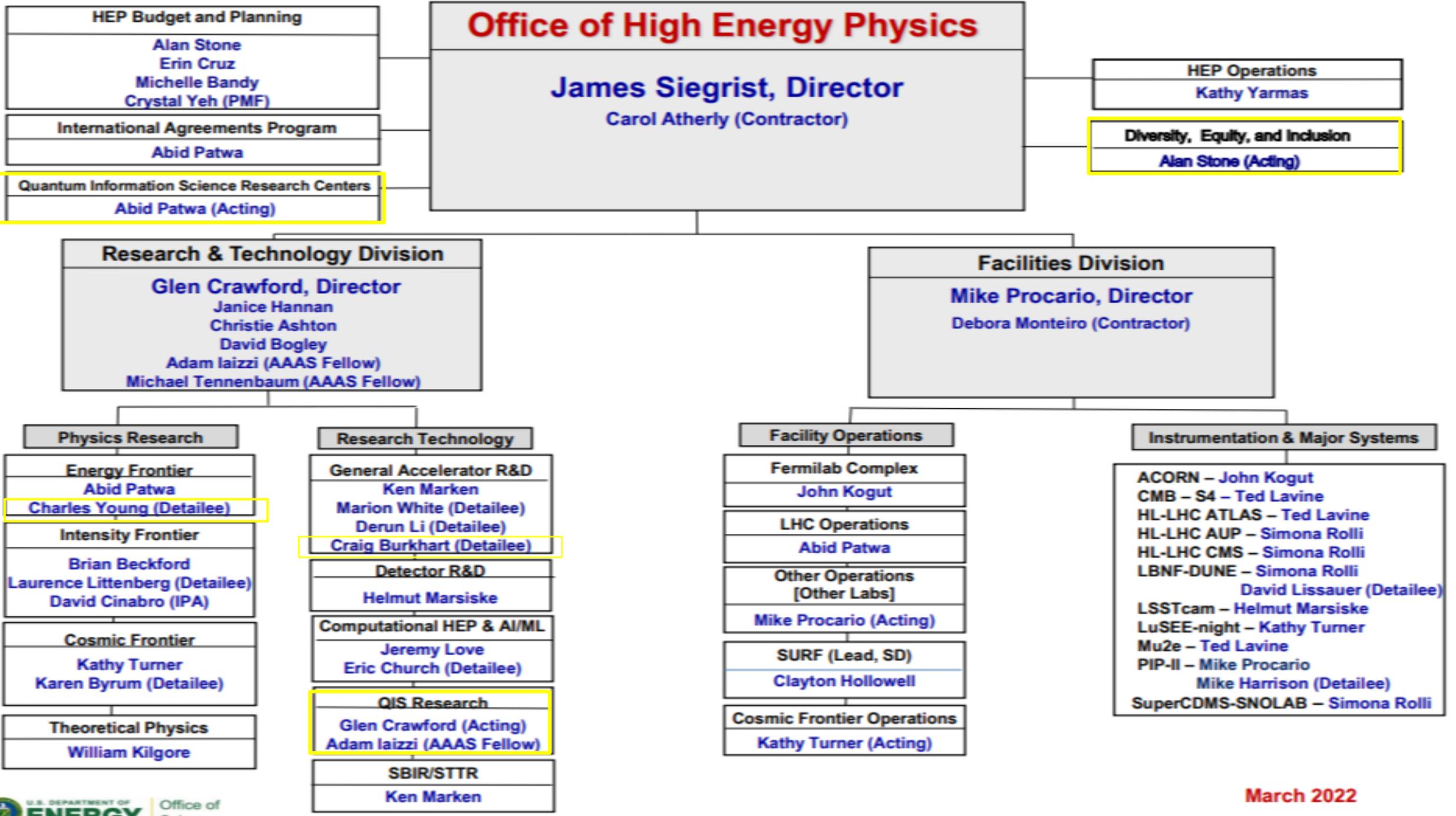
HEP Funding Opportunity Announcements

Current Funding Opportunities:

- ▶ **HEP Comparative Review** : External peer review completed, Initial decisions made.
 - ▶ **First round of funding guidance and declinations coming this month.** Further funding guidance and decisions depend on FY 2022 Appropriation.
- ▶ **US-Japan Program** : Peer review complete, decisions to be finalized in April
- ▶ **HEP Early Career** : Proposals out for review, decisions by summer.
- ▶ **SciDAC-5, SBIR/STTR** : as above

Planned Funding Opportunities:

- ▶ **HEP AI/ML** : Draft call circulating internally. Waiting for FY 2022 Appropriation.
- ▶ **HEP RENEW** : as above
- ▶ **HEP Traineeships** : TBD



Office of High Energy Physics

James Siegrist, Director

Carol Atherly (Contractor)

HEP Budget and Planning

Alan Stone
Erin Cruz
Michelle Bandy
Crystal Yeh (PMF)

International Agreements Program

Abid Patwa

Quantum Information Science Research Centers

Abid Patwa (Acting)

HEP Operations

Kathy Yarmas

Diversity, Equity, and Inclusion

Alan Stone (Acting)

Research & Technology Division

Glen Crawford, Director

Janice Hannan
Christie Ashton
David Bogley
Adam Iaizzi (AAAS Fellow)
Michael Tennenbaum (AAAS Fellow)

Facilities Division

Mike Procaro, Director

Debora Monteiro (Contractor)

Physics Research

Energy Frontier

Abid Patwa
Charles Young (Detailee)

Intensity Frontier

Brian Beckford
Laurence Littenberg (Detailee)
David Cinabro (IPA)

Cosmic Frontier

Kathy Turner
Karen Byrum (Detailee)

Theoretical Physics

William Kilgore

Research Technology

General Accelerator R&D

Ken Marken
Marion White (Detailee)
Derun Li (Detailee)
Craig Burkhardt (Detailee)

Detector R&D

Helmut Marsiske

Computational HEP & AI/ML

Jeremy Love
Eric Church (Detailee)

QIS Research

Glen Crawford (Acting)
Adam Iaizzi (AAAS Fellow)

SBIR/STTR

Ken Marken

Facility Operations

Fermilab Complex

John Kogut

LHC Operations

Abid Patwa

Other Operations [Other Labs]

Mike Procaro (Acting)

SURF (Lead, SD)

Clayton Hollowell

Cosmic Frontier Operations

Kathy Turner (Acting)

Instrumentation & Major Systems

ACORN – John Kogut
CMB – S4 – Ted Lavine
HL-LHC ATLAS – Ted Lavine
HL-LHC AUP – Simona Rolli
HL-LHC CMS – Simona Rolli
LBNF-DUNE – Simona Rolli
David Lissauer (Detailee)
LSSTcam – Helmut Marsiske
LuSEE-night – Kathy Turner
Mu2e – Ted Lavine
PIP-II – Mike Procaro
Mike Harrison (Detailee)
SuperCDMS-SNOLAB – Simona Rolli

HEP Office Staffing Plan



Snapshot of Current HEP Staff

- ▶ 3 Senior Executive Service (1 Associate Director + 2 Division Directors)
- ▶ ~20 Federal Staff (program/facility managers, program analysts, financial analysts, program support, admin)
- ▶ 2 Contract staff (term admins)
- ▶ 2 AAAS Fellows (international agreements, portfolio analytics)
- ▶ 1 Presidential Management Fellow (Communications)
- ▶ 7 Laboratory detailees (6 part-time, 1 full-time)
- ▶ 1 University IPA (full-time)
- ▶ + Summer interns (varies)

Relatively heavy reliance on term staff and lab/university rotators. Permanent staff levels need to increase to support new facilities, projects and initiatives.

HEP currently has 4 approved Fed staff openings in hiring queue, plus 3 more in approval process to backfill recent retirements and transfers.

DOE HEP Staff Update

Outgoing:

- ▶ LK Len retired at end of December.
- ▶ Lali Chatterjee moved to new position in ASCR at end of January.
- ▶ Altaf ("Tof") Carim retired at end of February.

Incoming:

- ▶ Charlie Young (Detailee, part-time) now assisting with **Energy Frontier**
- ▶ Craig Burkhardt (Detailee, part-time) now assisting with **General Accelerator R&D**

Job Opportunities!

Program Manager for Projects. *Offer made, accepted.*

(New) Program Manager for Cosmic Frontier. *Announcement closed. Interviewing candidates.*

Program Manager for Cosmic Operations. Announcement opened March 4. Apply at USAJOBS: <https://www.usajobs.gov/job/638535700>

Program Manager for General Accelerator R&D. Announcement opened March 4. Apply at USAJOBS: <https://www.usajobs.gov/GetJob/ViewDetails/639764100>

Also recruiting for additional IPAs/detailees, full- and part-time. Contact HEP management if interested.

Takeaway & Summary

- ▶ Broad support is enabling us to implement the P5 strategic plan and achieve its vision!
 - ▶ Many thanks to the DOE Management, the Administration, and Congress for their support
 - ▶ SC activities in Accelerators, Advanced Computing, QIS, AI/ML, Microelectronics, WDTS, and Science Laboratories Infrastructure (SLI) provide additional support to enable P5 goals
- ▶ Particle physics community is successfully implementing the P5 strategy by delivering on projects and producing excellent science, even while facing recent challenges
- ▶ We will continue to work with the community and our international partners as we proceed with the next phase of long-term community planning

▶ Key factors

- ▶ Informed scientific knowledge as the basis for recommendations and next steps
- ▶ Mutual respect among HEP subprograms
- ▶ Commitment to P5 strategy
- ▶ Meticulously level playing field - leading to **respect for process and outcomes**
- ▶ Deep appreciation for the wisdom of Ben Franklin
- ▶ Keep calm and don't panic
- ▶ Staying united we can accomplish great things
- ▶ Division will set back the entire field

