

CMS

## *Particle Physicists Deliver Discovery Science Through Collaboration*

**Particle physicists** seek to discover the fundamental laws of nature by making observations at the largest and smallest distances ever probed by humans. To meet this challenge, particle physicists from the U.S. and around the world join together in groups large and small. These collaborations have been incredibly successful at developing highly complex experiments and delivering world-leading scientific research.



Muon g-2



SPT-3G



PIP-II

# Delivering Discovery Science

Collaborations bring experiments from concept to reality. Scientists, students, engineers, and technicians work in concert throughout the course of an experiment, from design, through construction, to operations and analysis of data.

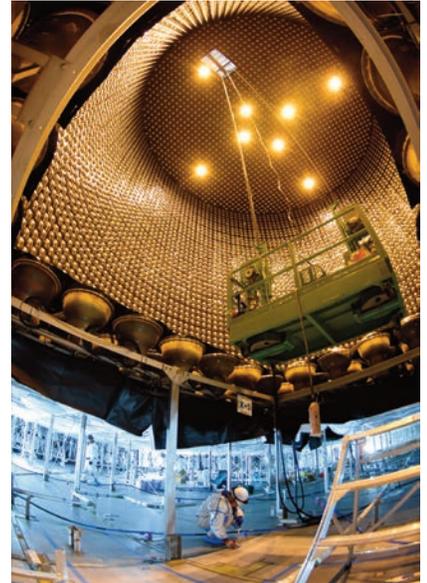
Their coordinated efforts allow the U.S. particle physics community to deliver on the long-term strategic plan of the Particle Physics Project Prioritization Panel (P5). The P5 strategy enables a steady stream of exciting new results across five intertwined science drivers.



DES



LHCb



SuperK and T2K



ADMX



LZ



PROSPECT



DESI

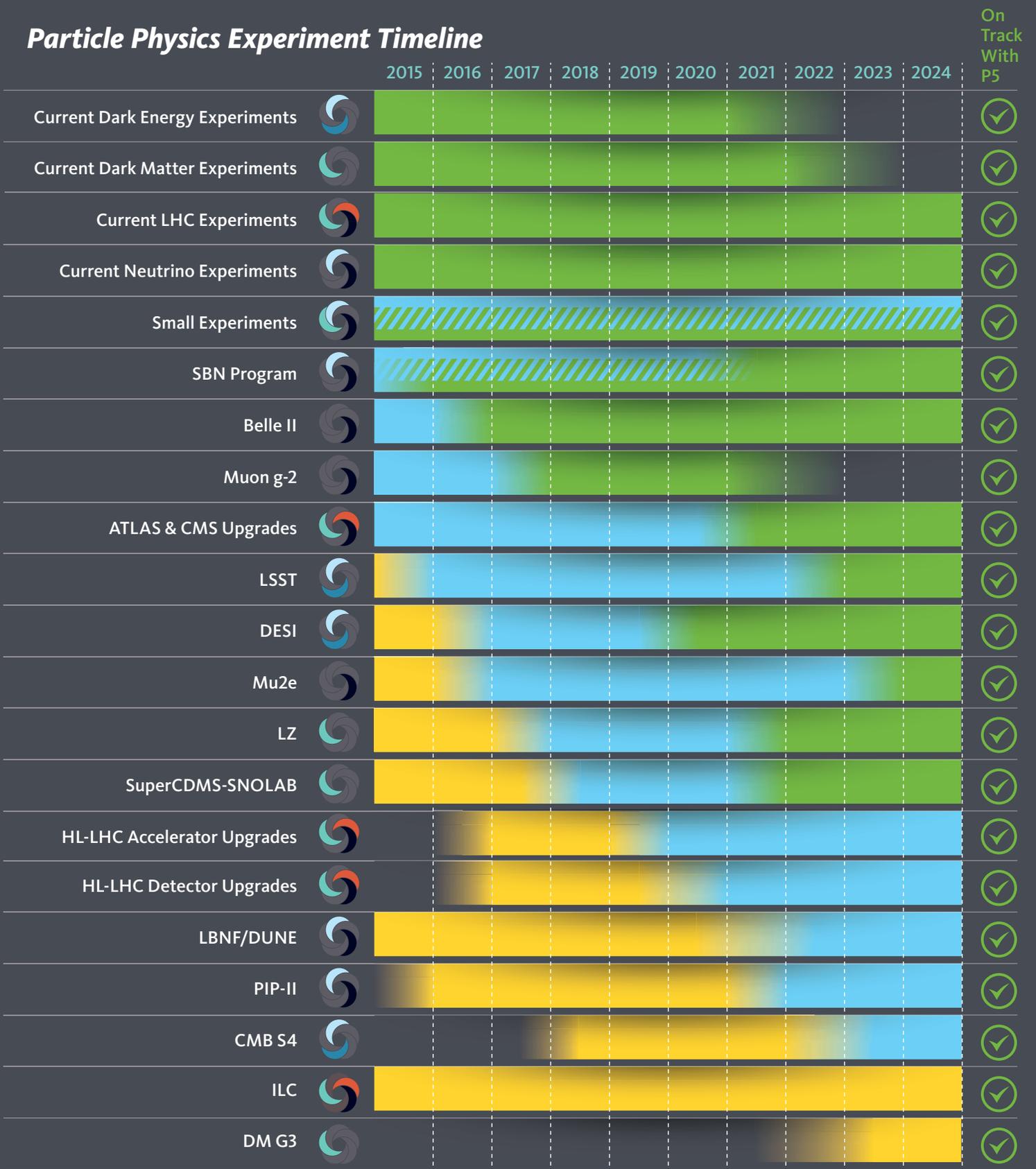


Mu2e



Belle II

# Particle Physics Experiment Timeline



## The science drivers



Use the Higgs Boson as a tool for discovery



Pursue physics associated with neutrino mass



Identify the new physics of dark matter



Understand dark energy and inflation



Explore the unknown



Operation & Analysis



Fabrication/Construction



Conceptual & Technical Design

# The particle physics community is committed to creating and sustaining a diverse, equitable, and inclusive environment

as the foundation for successful scientific collaborations and takes concrete steps to increase awareness, reduce bias, and eliminate inequities.

## Building a collaboration

Particle physics collaborations bring together many different partners. Each contributes essential skills and resources that enable scientists to answer fundamental questions about the universe.



Industrial partners will excavate an underground site for DUNE.

### Industry

Particle physicists turn to U.S. businesses small and large for specialized parts and equipment. Contracts for construction, fabrication, and services generate jobs for thousands of Americans.



Private contributions enabled early work on LSST.



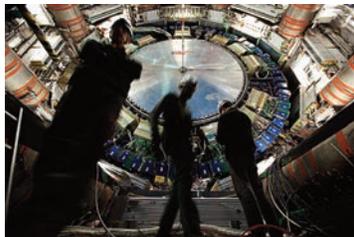
Inspiring future experiments.



Operating MicroBooNE.

### Universities

University researchers inspire, develop, and build experiments that push the frontiers of discovery science and play a vital role in training the next generation of scientists and engineers.



Upgrading ATLAS at the LHC.

### National Laboratories

Scientists and engineers at U.S. National Laboratories develop, build, and operate some of the most advanced equipment of modern science including world-class accelerators and ultra-sensitive detectors.



Building SuperCDMS-SNOLAB.



Over a thousand U.S. scientists work on LHC experiments.

### International Partners

International partners bring their unique expertise to U.S.-hosted experiments and collaborate with U.S. scientists on world-class experiments hosted elsewhere.



International partners join U.S. scientists on NOVA.



usparticlephysics.org

Prepared by:

