Exploring the fundamental nature of the Universe

Paul Tipton
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Paul Tipton questions existing scientific models of the physical Universe and searches for new understanding of how the Universe works, discovering and characterizing new particles and searching for other phenomenon beyond the Standard Model of physics.

Tipton is an American Physical Society (APS) Fellow. He was awarded the National Science Foundation (NSF) Young Investigator Award, the United States Department of Energy (DOE) Outstanding Junior Investigator Award, and multiple teaching excellence awards.

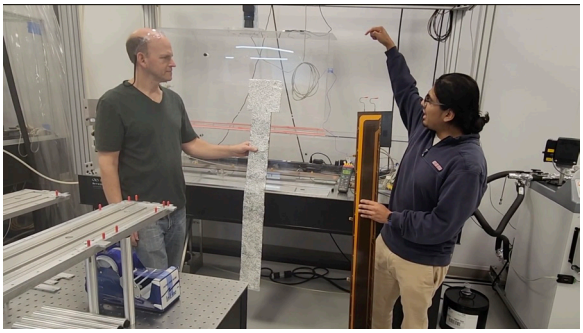
Tipton was co-convener of the Collider Detector at Fermilab (CDF) Top and B Quark Physics Group, a member of the Physics Advisory Committee at Fermilab, and a member of the Editorial and Planning Committee for the journal *Annual Review of Nuclear and Particle Science*. He served as Chair of the Yale Department of Physics from 2013-2019.

ATLAS stave core production

In order to probe further into unexplored physics territory, scientists seek to collect more collision data per second. The Paul Tipton group accomplishes this through a series of staged upgrades of both the Large Hadron Collider (LHC) at the European Organization for Nuclear Research (CERN) in Switzerland and the ATLAS detector.

In a Wright Lab clean room, a research team led by Tipton is fabricating essential components of a new particle detector that will track the path of charged particles as they leave the collision point of the LHC. Tipton's team, part of the ATLAS collaboration, is working on a schedule such that the new particle tracker will be installed at CERN in 2026.

The Tipton group has been conducting research and development and prototyping the construction of state-of-the-art low-mass structures to hold sensors (i.e., particle detectors) that will track particles as they leave the interaction point. The structures, called stave cores, are the basic building block of the new tracking detector for ATLAS. The stave cores precisely locate the sensors, while also providing cooling and electrical connections into and out of the interaction region.



The team will fabricate approximately 225 stave cores, then ship them to Brookhaven National Laboratory (BNL) in New York, where the sensors will be mounted on them, before their journey on to CERN, where they will be installed in the upgraded ATLAS detector.