A Bet that Paid Off for Science: David Leith's 50 Years at SLAC

June 27, 2014

David Leith

Before David Leith joined SLAC in 1966, he had already made a pivotal decision that would impact the rest of his life: While attending the University of Glasgow he decided that if he graduated at the top of his class he would pursue a career in science, and if not, he would pursue a life in the ministry. Decades later, he has no regrets, and his colleagues and friends, as well as the larger scientific community, are grateful for the path Leith chose.

“Somewhere in the pursuit of my undergraduate degree, my high school sweetheart and I made a pact,” he reflected shortly after his retirement in May. “And I ended up continuing graduate work at Glasgow.”

With a bachelor's degree and PhD in natural philosophy from the University of Glasgow, Leith joined CERN as a staff physicist. After three years, Stanford offered him a position, but Leith wasn’t ready to leave Europe and uproot his young family. However, the following year, Stanford returned with an offer that was hard to refuse.

Leith immigrated to the United States with his wife Doreen and two sons. The family welcomed a third son and, he reflected, “In 1966, long distance phone calls and travel were expensive, so we’d send tape recordings to keep in touch.”

As associate director of the SLAC Research Division, Leith worked with the high-energy physics groups on program and budget issues. The DOE had formal relations with programs in China, Japan and Russia, as well as less formal relations with other labs and countries. The Russia and Japan programs were turned

over to Leith, who did a terrific job keeping joint work on track, according to SLAC Director Emeritus and Nobel laureate Burton Richter.

The Building of BaBar

As part of this position, Leith also oversaw the building of the BaBar detector, which was designed to study the millions of *B* mesons produced by the PEP-II storage ring. He set up the first International Finance Committee to support BaBar, which was a new approach for SLAC and also for other labs in the United States.

Mike Roney, current BaBar spokesperson at the University of Victoria in Canada, remembers when he first heard of a "giant Scotsman called Leith" who led a reputable group at SLAC.

“David has been a stalwart supporter of BaBar and has continued to support its science from its infancy through design, construction, commissioning and running from 1999 through to this day,” said Roney. “So much of the credit for the success of this amazing collaboration and scientific endeavor can be attributed to David’s work.”

The *B* mesons observed in the BaBar detector enabled detailed exploration of the puzzling phenomenon called CP violation, which is a necessary ingredient in theories that attempt to explain the observed preponderance of matter over antimatter in our universe.

“About 12 years ago, there was an unexpected experimental discovery of dark matter and dark energy,” said Leith. “At that point our work turned out to be a pretty good picture not of the universe, but of only a tiny little bit, only about 4.5 percent, of the universe that I thought I knew, which was a humbling and yet awe-inspiring experience.”

As the Research ALD, Leith helped move forward the building and support of the Fermi Gamma-ray Space Telescope, a collaboration between DOE and NASA. It is the newest major space observatory designed to unveil the mysteries of the high-energy universe, and is still orbiting the Earth and providing exciting new observations.

Leith was SLAC’s representative on the international committees supporting the collaborations of U.S. scientists with Russia and Japan. His research built strong relationships with many Russian scientists at the Siberian branch of the Russian Academy of Sciences, Nagoya University and later Tohoku University.

"David's broad background and keen interest in the international particle physics community has been instrumental in positioning SLAC as a sought-after collaborator worldwide and, in particular, was key to forging the fifty-fifty partnership of U.S. and non-U.S. participants on the BaBar program," said David MacFarlane, associate laboratory director for Particle Physics and Astrophysics.

SLAC Summer Institute: Sharing a Love of Discovery

In the early days it was important to build a strong bridge between the Physics Department at Stanford and SLAC. “A few of us worked hard on this, and it grew slowly,” Leith said. “By the early 1970s, nearly half of the incoming physics graduate class at Stanford worked at SLAC alongside SLAC professors. The academic life of the lab has been strongly fueled by faculty, postdocs and grad students working with staff. They are a big part of the engine that gets science done.”

The SLAC Summer Institute helped grow a stronger academic life for the SLAC faculty. It turned out to fill a need within the national high-energy physics community and within the laboratory itself. Each year a different frontier of the field was examined in depth in a school format with daily lectures and discussion groups, and at the end there was a three-day topical conference where leaders of the experiments with the most interesting results would present their work and discuss the conclusions.

There is a glint in Leith’s eye as he reflects on the years he spent with students sharing his love of science and discovery.

“I was fortunate to enjoy the freedom to decide what I wanted to study, and likewise enjoyed generous support for doing it,” he said, remembering the 15 Stanford PhDs and the 25 others from collaborating universities who worked with him, and the 50 postdocs who spent their time with him over the past 50 years.

To say he was a mentor to these students is an understatement. Two-thirds of them have professional careers and are scientific leaders in Europe, Japan, Russia and the United States. “The relationships I’ve built with these people are as meaningful and satisfying as the science I’ve done myself,” he said.

Jose Benitez earned his PhD from Stanford in 2011 and was accepted at CERN as a fellow. There, Benitez was integral to the search for the Higgs boson. Under Leith’s tutelage, Benitez became a well-rounded scientist by doing detector development work, detector operations and data analysis projects.

“David was not only a PhD thesis adviser, but also a career adviser and a friend,” said Benitez. “During my time with his group I made many important accomplishments, which would not have been possible without his great leadership.”

Understanding the Universe

The original roster of those who led the experimental program with Leith the year the linear accelerator was turned on included Joe Ballam, Martin Perl, Dick Taylor and Richter. Richter commented on the significance of Leith's retirement: “David’s retirement marks the final passing of the torch, as the last of the starters now retires.”

As for how he will spend his days once he departs SLAC, Leith plans on playing golf with his two sons – one a judge in Salem, Oregon, and the other a golf director in Indio, in Southern California – and spending time with his wife, grandchildren and friends.

When asked about the career paths he considered while pursuing his undergraduate degree, Leith paused and thoughtfully expressed that the pursuit of scientific discovery and the ministry are not in fact opposed.

“I think of what I’m doing as understanding God’s universe from the perspective of experimental measurements and theoretical explanations of how the universe is created and functions,” said Leith. “And ministry is working with people and their relationship to God and their lifestyle. So the choice I set before myself wasn’t contradictory; in fact they were, and indeed are, one and the same.”

From left: Gary Feldman, Jonathan Dorfan, Harvey Lynch, David Leith and Fred Gilman.

()

Pief Panofsky, David Leith, Tune Kamae and Burton Richter in May

2007.

Tags

Summer School Programs BaBar Particle Physics & Astrophysics (PPA) Particle Physics History & Lore

SLAC People