New SLAC director grapples with change

Layoffs, budget cuts, a call for new vision in high-energy physics–in her first months as director of Stanford Linear Accelerator Center, Persis Drell had a lot to navigate. By Glennda Chui

Photos: Brad Plummer, SLAC

When Persis Drell became director of the Stanford Linear Accelerator Center last December, news accounts focused on her role as one of the first female directors of a US national laboratory.

But while taking note of that milestone, the high-energy physics community focused on a more pressing question: How would Drell guide SLAC through perhaps the most challenging time in its history?

The lab had already called for voluntary layoffs, part of an effort to adjust the mix of skills in its workforce to the needs of future programs; 72 people responded. Then, just 11 days after Drell took over, Congress cut funding for high-energy physics, resulting in a 20 percent reduction in SLAC's high-energy physics budget for FY08. Drell led the SLAC management team in making the wrenching decision to lay off 119 more employees and to end operations of the *B*-factory, the lab's only on-site particle physics experiment, months earlier than planned.

It wasn't long before Drell began to articulate, in unabashedly frank language, a call for vision at SLAC and in the physics community.

Unsettling questions

At meetings of two influential advisory panels, best known by their acronyms, HEPAP and P5, she tackled the field's reduced budget prospects head-on. While some in the field saw Drell's words as divisive, she says they were not intended that way.

"The future of particle physics at SLAC is intimately coupled to the basic questions facing high-energy physics as a whole in the US," she told HEPAP. "I believe particle physics has fared poorly because we were perceived as not having a realistic plan for our future."

She went on to pose a series of questions the field must answer to justify the funding needed to maintain a healthy program: Does the US really need to operate its own high-energy physics accelerator? Beyond Fermilab, the designated national accelerator laboratory for high-energy physics, does it really need high-energy physics programs at other labs, such as SLAC, Lawrence Berkeley, Cornell, or Brookhaven? What role should the United States take in the international effort to push accelerator physics to ever-higher energies?

"The answers to these questions cannot be based on what we will lose if we don't get what we want," Drell told the panels. "They have to be based on what we will win."

Yes, Drell acknowledges, her questions were intentionally provocative.

"Those questions were designed to make everyone feel uncomfortable," she says. "But I think one of the most damaging things the field could do would be to marginalize the importance of dealing with the really difficult issues we are facing by saying, 'Oh, this is just one lab versus another.' We have to deal with the question of why we need to continue strong support of high-energy physics in this country when the frontier of the field is moving to Europe. My main point is if we don't ask these questions, somebody else will, and we have to be prepared to answer them."

Vintage Persis

The message may have been a surprise, but not the fact that Drell delivered it.

"It's really vintage Persis," says Jim Alexander, director of Cornell University's Laboratory of Elementary-Particle Physics, who has known and worked with Drell since their postdoc days. "She's taking the long view, looking at the biggest and broadest issues, and she's quite willing to say things that are controversial. People listen very carefully to her because they respect her and they respect her judgment, but it certainly doesn't mean they're going to agree with her."

Drell's roots at SLAC go deep; her father, Sid Drell, was the lab's deputy director. ("See if you can avoid mentioning my father in the first paragraph," she says, laughing. "I always resent it when women get defined by the males in their lives.") She earned a PhD in atomic physics at the University of California, Berkeley and did a postdoc at Lawrence Berkeley National Laboratory that included work on SLAC's MARK II detector.

In 1988 she joined the faculty at Cornell, where she used the CLEO II detector to study the physics of *B* mesons and helped that lab face its own transition.

"Persis was here when it became clear that CLEO was going to have to end as an experiment doing *B* physics, and she was absolutely instrumental in seeing the path beyond CLEO," says Ritchie Patterson, a Cornell professor who was Drell's first postdoc there.

Patterson says Drell was a valuable mentor, both as a scientist and as a woman working in an overwhelmingly male field.

"She didn't really hide the fact that her family life was important to her," Patterson says. "So she would move the seminar half an hour earlier so she could pick her kids up from daycare. There were plenty of fathers who needed to go pick up their kids, too, but who hadn't done anything about it or who snuck out early. I think it was probably a welcome change for an enormous number of people."

As for research, Patterson says, Drell is "wonderful at getting to the heart of a problem. So you can see a big mess in front of you and she can distill it into its essence. She has an incredible understanding of what people need to be effective and to do good science."

"The umbrella under which we see our future scientific program developing is seeking to understand the structure and dynamics of matter, from the very smallest to the very largest scales in the universe."

Shifting gears

By the time Drell moved to SLAC in 2002, her interest had shifted to particle astrophysics. She chaired a task force that produced *Quantum Universe*, a report that outlined, in clear and compelling language, nine fundamental questions about the nature of the universe that particle physics is poised to address. She also served as deputy project manager of GLAST, the Gamma Ray Large Area Space Telescope.

"You know, my greatest frustration with this job I have is that GLAST is going to launch soon, and there's a big piece of me invested in that instrument, and I'm not going to get to have fun with the first data," Drell says. "When you put up a detector that's orders of magnitude better than anybody has ever put up before, even the novice can have fun."

In fact, Drell made the move into the directorship reluctantly. About 18 months after agreeing to serve as SLAC's deputy director in 2005, she made it clear that her intention was to step down and return to research. But when the president and provost of Stanford University asked her to take the director's seat, in the end she could not say no; the subsequent budget cuts, she says, "only made it clearer that a new person coming in would have had a very difficult time doing what we had to do."

What does the future hold for SLAC?

"The umbrella under which we see our future scientific program developing is seeking to understand the structure and dynamics of matter, from the very smallest to the very largest scales in the universe," Drell says.

"Whatever we choose to do—there is going to be a set of fields we choose to engage in—we're going to be outstanding in those fields. I don't want to be second-best. Excellence is in the tradition of this laboratory, and I don't want to change that."

Setting a course

With the *B*-factory no longer operating, the lab's focus is shifting to photon science at the Linac Coherent Light Source, which will image processes on atomic scales of length and time with extraordinarily brilliant beams of X-ray light. It's scheduled to open in 2009.

Drell says SLAC will maintain its excellence in accelerator physics, performing research that helps define the technology frontiers for the field. It will collaborate on ATLAS, one of two major detectors at the soon-to-open Large Hadron Collider on the Swiss-French border; Drell says she hopes to create a regional center to support ATLAS scientists on the West Coast.

At the other end of the scale, she plans to maintain the lab's leadership role in particle astrophysics through the Kavli Institute for Particle Astrophysics and Cosmology, the GLAST mission, and the proposed Large Synoptic Survey Telescope, which would scan deep space for clues to dark matter and dark energy.

Drell also wants to build even stronger ties with Stanford University, which manages the lab for the Department of Energy, and with Silicon Valley—although she admits she has no clue what that might entail. "At this point, this is just a dream," she says, "but fundamental research in the photon science field can link rather directly to more mission-directed research, which can link more directly to actual deliverables. I don't want to become an applied science lab, but to the extent that we understand those couplings better, I think it'll be better for everybody."

To read a transcript of the interview, go to http://symmetrymagazine.org/drell/