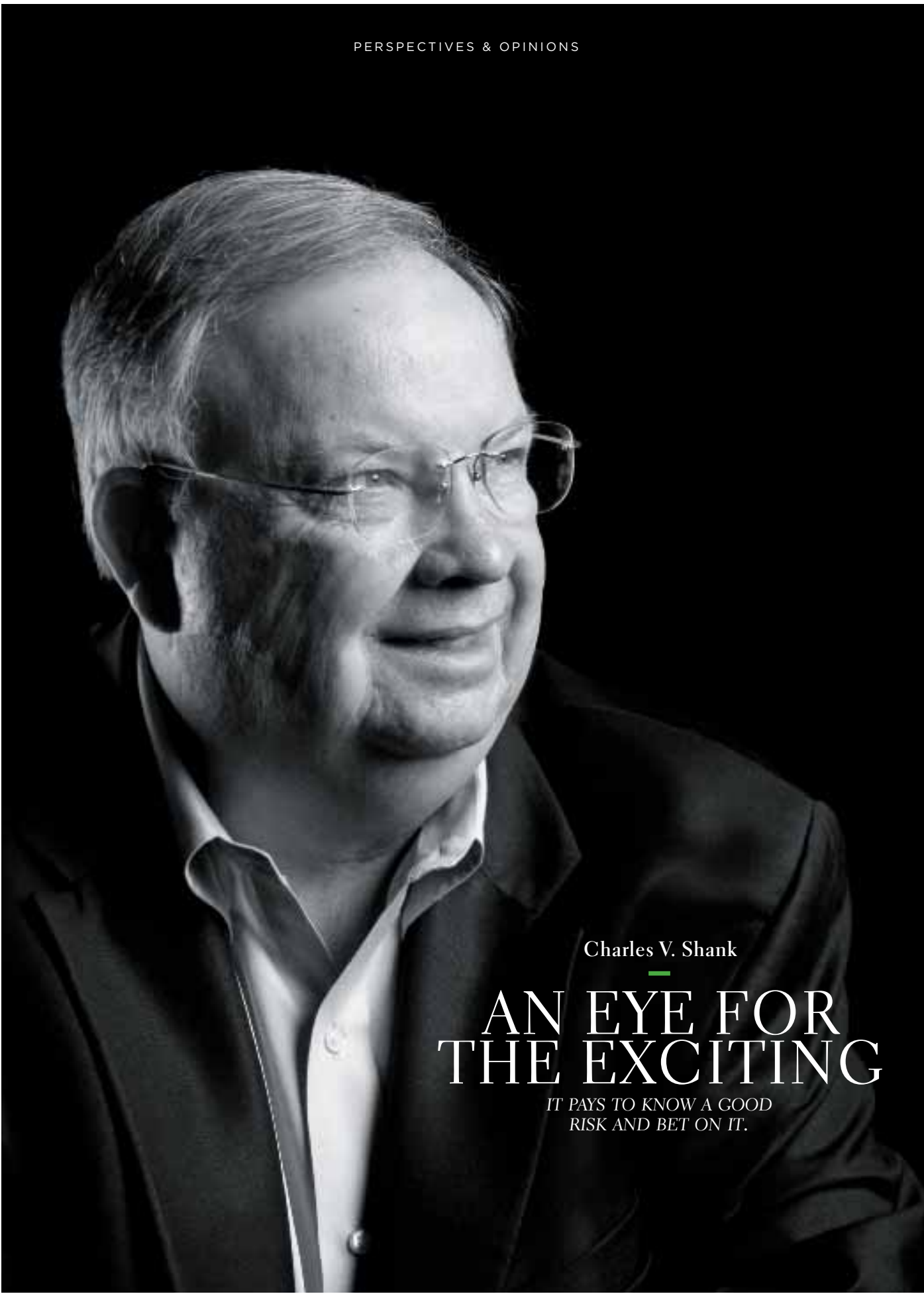


PERSPECTIVES & OPINIONS



Charles V. Shank

AN EYE FOR
THE EXCITING

IT PAYS TO KNOW A GOOD
RISK AND BET ON IT.

Paul Fetters

Charles V. Shank is ready for some fun. Launching a new optical physics laboratory at HHMI's Janelia Farm as the "third half" of his career, the longtime director of the Lawrence Berkeley National Laboratory has said farewell to bureaucratic exigencies that limit scientific risk-taking. HHMI is all about adventurous research, he says, a rare commodity since the heyday of AT&T's Bell Laboratories, where he began his career and stayed for 20 years, and which he eventually directed.

What drives you, as a scientist?

The most important thing in my scientific life is to be excited about what I'm doing. To me, science is about seeing an opportunity and betting your career. It's people who bet their careers who make a difference.

It's been a number of years since I've really had a chance to put my hands on instruments. What I want to do at Janelia is to have fun, and I want to do some work that is risky. And this is very, very much like my life at Bell Laboratories, where typically you'd have a very small group of people you'd work with, but you got the chance to interact with some of the greatest scientists of the generation.

What is your scientific goal at Janelia Farm?

We would like to be able to see inside a brain and monitor its function and morphology directly, using lasers. One not only has to understand the neurobiology, but we also need fresh approaches to access that biology, with new technologies, new science, engineering, physics, chemistry—all of those things are really going to be important.

Can you describe some of these new approaches?

They range from using ultrashort optical pulses to using very novel forms of light—it's probably too complicated, but I'm referring to very unusual photons that are manipulated into what is known as an "entangled state." Basically, we're taking novel approaches, using different kinds of photons, to apply them to the image problem. The kind of creatures that we are looking at range from flies to mice—probably nothing much more complicated than a mouse, in the near term.

Why couldn't you have undertaken this research at a government laboratory?

It's highly unlikely that anything I'm doing right now at HHMI would be funded in the federal ranking system. I know a lot about it, having directed a major lab for the Department of Energy. The peer-review process that we have at the National

Institutes of Health, as well as other places, does a great job of clipping off the bottom. Unfortunately, it also clips off the top. And the result is a kind of homogeneity, where truly interesting ideas don't get a chance to prosper. Some of the best work done at Lawrence Berkeley National Lab did not get funded the normal way.

For example?

Look at Saul Perlmutter's work on dark energy. There wasn't any official funding stream for that until years after the discovery was made, and it's arguably the most profound discovery of the last century—realizing that there's 70 percent of the universe, which we call dark energy, we know nothing about.

I had this project reviewed every year, and every review said, 'Kill it; it's not going anywhere.' But there was a young guy who bet his life on this. He had a flicker of a hope, and he found the unexpected. And, the unexpected was not the discovery that the universe is expanding, but that the universe is *accelerating* in expansion. So, it's got to be an energy that drives that, and that is a profound discovery. I'm sure he'll get a Nobel Prize for it. There's no question; it's just a matter of time.

So, how did you get that funded?

I had some discretionary funding at the laboratory, which I could control, a very small amount, and I used it to bet on risky things.

You have been at Janelia since July 2007. So far, so good?

I feel like a graduate student here. Much of the science is new to me, and I bring what I know and combine it with the science that people here have, and in the end we'll be successful. What's different here—and what's very difficult to do at a university—is the interaction with colleagues. Each person in a typical university environment is supposed to own some part of the educational enterprise, and each person is to stake out a territory. Here, the territory is the whole institution. We can do things that no one of us could have done by ourselves.

INTERVIEW BY HARVEY LEIFERT. *Charles Shank is a Senior Fellow at HHMI's Janelia Farm Research Campus, located near Ashburn, Virginia.*